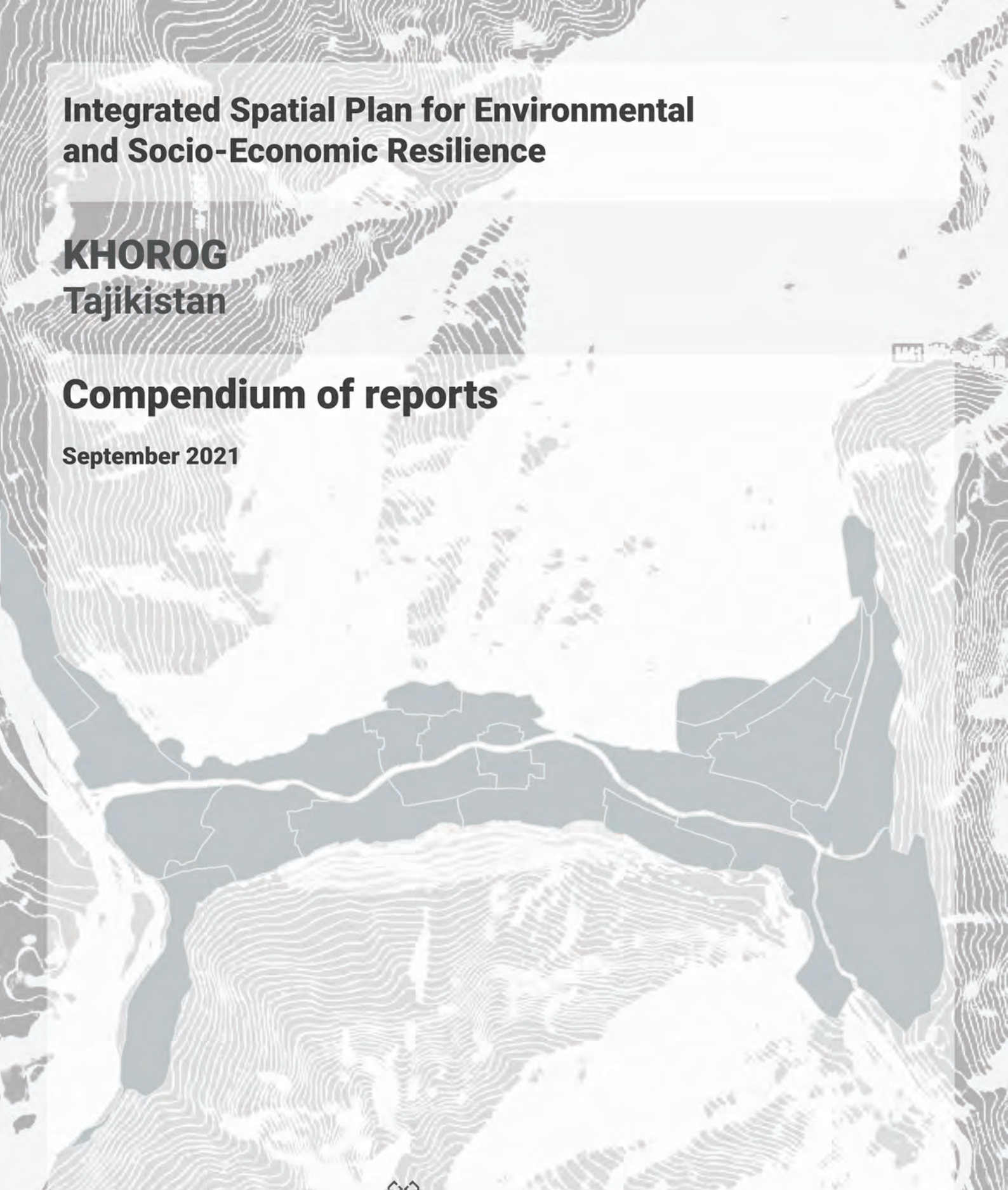
Integrated Spatial Plan for Environmental and Socio-Economic Resilience

KHOROG
Tajikistan

Compendium of reports

September 2021



UN HABITAT
FOR A BETTER URBAN FUTURE

Aga Khan Agency for Habitat

Habitat Planning
A Programme of the Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience
Khorog, Tajikistan

Compendium of reports

Aga Khan Agency for Habitat
www.akdn.org

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RESILIENT KHOROG 2035

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UN HABITAT FOR A BETTER URBAN FUTURE

Habitat Planning

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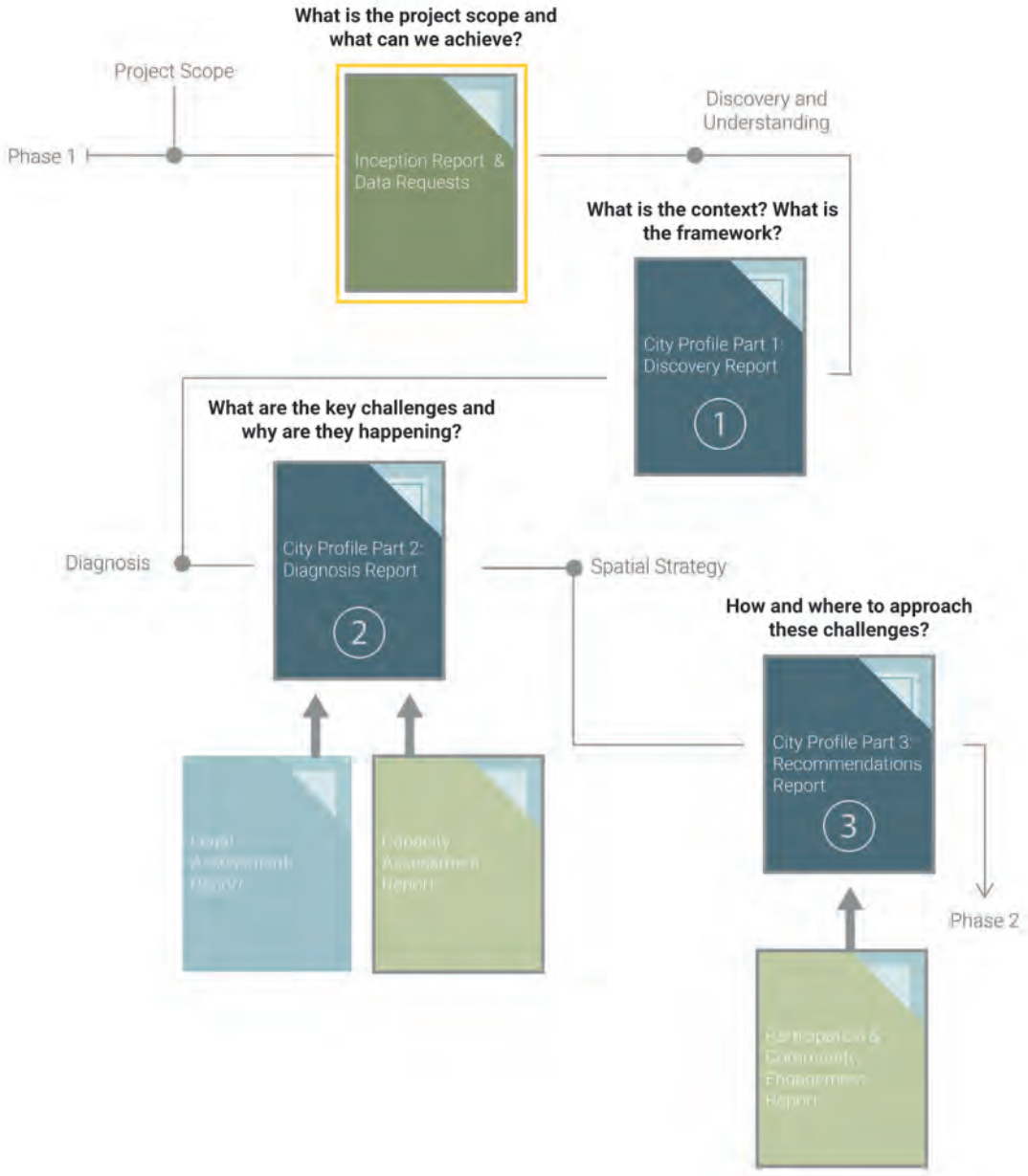

Fig 1. View on Khorog from Imomobod 1, May 2021

GENERAL INFORMATION

The United Nations Human Settlements Programme (UN-Habitat) and Aga Khan Agency for Habitat (AKAH) signed a strategic Memorandum of Understanding (MoU) on the 30th of May 2019 during UN-Habitat's First Assembly "Innovation for Better Quality of Life in Cities and Communities" at UN-Habitat's headquarters in Nairobi, Kenya.

The MoU aims to provide a framework of cooperation within which UN-Habitat and AKAH will operate, to further expand and strengthen partnerships. This framework of collaboration facilitates the generation and implementation of unique methodologies for inclusive and resilient planning within secondary/ intermediary cities.

The selection of Tajikistan for the project is well aligned with UN-Habitat's plans to increase its technical support capacity in the Commonwealth of Independent States as part of its Strategic Plan 2020-23, in recognition of the urbanisation processes taking place in these countries.

The project will provide the planning direction to improve resilience and social stability for existing communities and to sustainably accommodate the projected population growth of Khorog. More specifically, the project will provide environmental, legal, economic, spatial and infrastructural policy recommendations and projections, governance and management guidance, recommendations for transformative projects, and technical capacity-building in planning processes for stakeholders.

The overall Project Objective is:

To guide resilient, sustainable development and improve social stability in Khorog.

The Specific Objective is:

To build the capacity in local government and provide technical assistance and a set of spatial strategic plans, guidelines, and policies that are integrated with governance and management plans, to guide the future growth of Khorog.

This report is compiled at a very early stage in the project development and is based on preliminary desktop research undertaken by the UN-Habitat team. Initial findings, knowledge gaps and data requirements for the targeted analyses and assessments were identified. However, not all of the required data was able to be accessed. Therefore, the approach and planned assessments were adjusted and the methodology adapted for the data available. The commitment to conduct these analyses have not been removed from this report to demonstrate the intention and the approach to the various thematic areas, even though the expected studies were not available.

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Fig 2. Pedestrian bridge in the central area in Khorog, May 2021

1

INTRODUCTION

In the initial phases of this project, the UN-Habitat team undertook a period of preliminary research, using publicly available information from government and independent sources, and both governmental and non-governmental studies and reports.

Several clear trends emerged in the initial phase of research. It became clear that the majority of available and most current information can be sourced from non-governmental reports. It also became apparent that the Aga Khan Development Network (AKDN) is the singular source of the most up-to-date information about the city, meaning that authorship diversity was lacking. Further data, as well as multiple meetings with relevant stakeholders, will be required to build an understanding of the full extent of challenges and opportunities that the city is presented with. This inception report provides an initial proposition on who the relevant stakeholders for engagement on this matter will be. Consultation with the Aga Khan Agency for Habitat (AKAH) will be required to establish a final list of contacts and focal points for consultation on each thematic area.

In addition, the research phase uncovered no consolidated framework for urban development in the city. This is particularly apparent in reference to specific themes such as climate resilience, where there are numerous programmes and initiatives being undertaken by various groups, though without coordination or common guidelines.

It is evident that if the potential for urban growth is to be accommodated, a diversity of challenges currently faced by the city must first be addressed. This first stage of research highlighted that notwithstanding recent efforts to enhance provision, key urban basic services such as energy and water, are not equally or consistently accessible, due to political, financial and environmental factors. The challenges uncovered in this initial research phase are outlined in the following chapters of this report.

The inception report provides an overview of preliminary development challenges and any information gaps, highlighting the requirements for targeted data collection and a stakeholder engagement strategy. Addressing gaps in the research with these tools will ensure an evidence-based, unified, integrated and participatory approach to planning, with outcomes of multi-scalar spatial and strategic guides and frameworks that are environmentally, financially and legally sustainable.

This report forms part of the 'Discovery and Understanding' phase of the Integrated Spatial Plan for Environmental and Socio-Economic Resilience in Khorog, Tajikistan.

(Month 1) Scoping Outputs
Desk review of the sources available
Generated data set (GIS data, planning documents and reports)

Table 1. Scoping Outputs. source: p. 45. Khorog project proposal

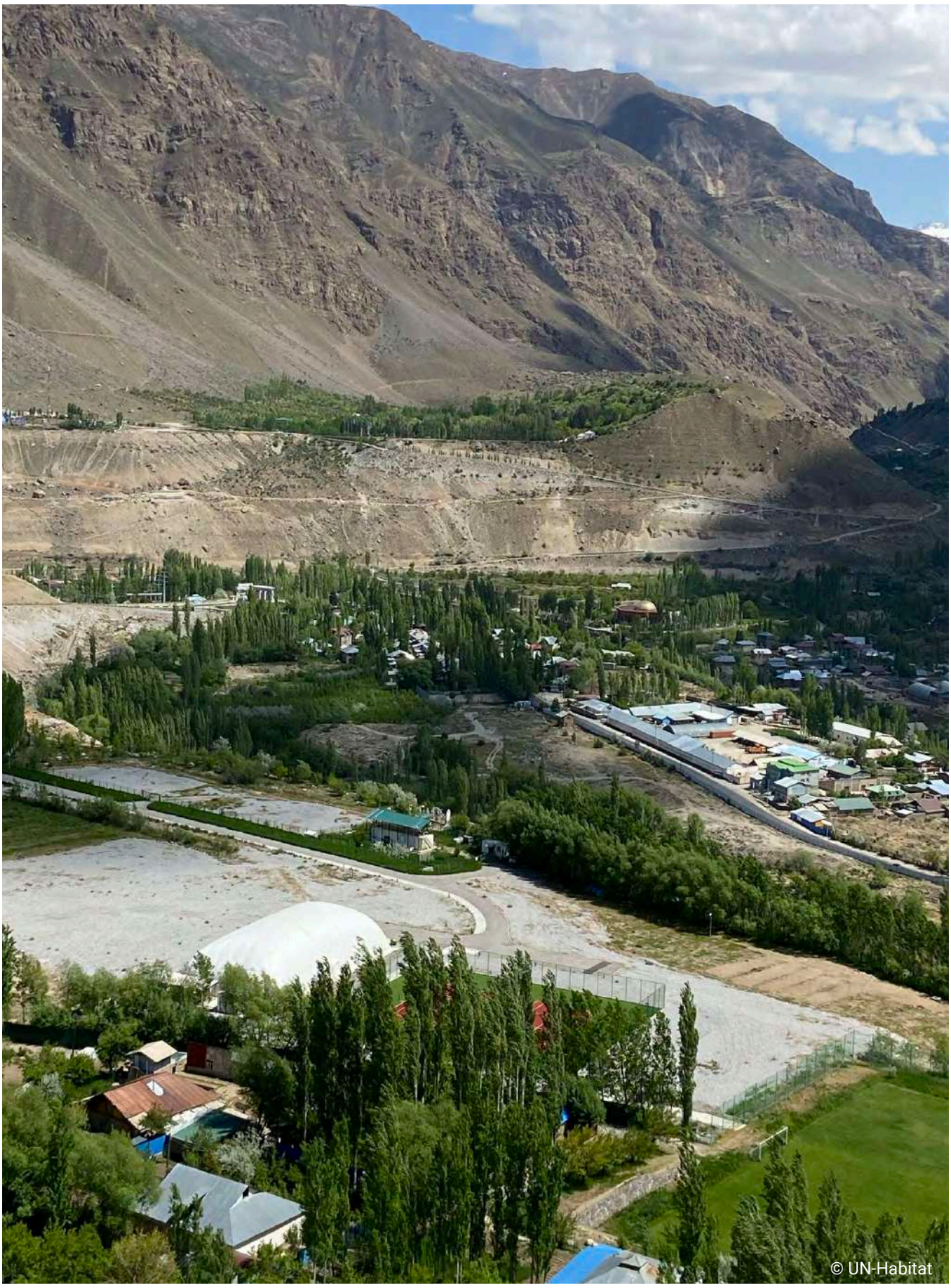


Fig 3. A view on Khorog from Imomobod 2, May 2021

2

STRATEGIC CONTEXT

2.1. SNAPSHOT INDICATORS (COUNTRY LEVEL)

Population, Total	9,100,837
Population Growth (annual %)	2.5
Urban Population Growth (annual %)	3
Urbanisation (%)	27.51
Poverty headcount ration at the national poverty lines (% of population)	27.4
GDP per Capita (USD)	836.62
GDP Growth (annual %)	7.3
Human Development Index (HDI)	0.656 (125 out of 189 countries)
Gender Inequality Index (GII)	0.377 (84 out of 162)
Environmental Performance Index (EPI)	11 (out of 180)

Table 2. Snapshot of the country's indicators.

2.2. NATIONAL & INTERNATIONAL SETTING

(Month 1-4) Discovery and understanding - Analysis of existing conditions

Initial research indicated a population increase over recent years, however, the extent of urbanisation remains low. Between 2000 and 2014 Tajikistan's population grew by 34.10 per cent. Despite a growing population, urbanisation increased by only 0.21 per cent in the same years. The country remains primarily rural and the majority of cities have fewer than 50,000 inhabitants. It was found that urban areas were more economically productive than rural areas, though they do not constitute an overwhelming share of the economy's growth.

The strategic analysis phase of this project will provide a comprehensive overview of major and secondary cities of the country, and rural settlements, overlaid with nationwide data on connectivity, topography and climate change. This will inform a forecast of potential rural to urban migration patterns. This mode of analysis will help to build targeted regional scenarios in spatial and economic development for the GBAO region and particularly, the city of Khorog.

GIS data will be requested to visualise the current trends in a set of maps at the national scale, and in the GBAO region. Technical GIS expertise and current studies that apply to the national and regional scale may be requested as per the agreement with AKAH.

Alongside the data requests, a meeting with relevant national authorities may be required to discuss the broader population profile and spatial trends of the country. The format of the meetings with the relevant ministry/committee will be organised in close consultation with the partner agencies (UN partner agencies in Tajikistan and AKAH).

2.3. ADMINISTRATIVE & GOVERNANCE SYSTEM – A BRIEF OVERVIEW

The initial assessment indicated that the country has made efforts to decentralise city management to local government and harmonise laws with new constitutional norms introduced after the collapse of the Soviet Union (November 6, 1994). The Majlis of People's Deputies, led by a chairperson was created as the body of local representative power in the regions and districts, while local executive power is exercised by a representative of the President.

Fig 4. A view from Andarsitez, May 2021

The further governmental analysis will be built upon the UN-Habitat research presented here and validated by representatives from both national and local governments. Assessments of the governance structure will focus on planning mandates, the evolution of planning laws, and the processes of plan implementation. The study will form the first phase of the comprehensive Planning Legislation and Governance Structure Assessment. It will be presented as a separate component, and include a report on capacity gaps and requirements for sustainable urban development and resilience planning in the city. The initial phase will include data collected, translated into a set of diagrams and tables, to be validated during the scoping mission (if the security situation permits) or during online meetings.

For the assessment and graphic representation of the analysis, GIS data on the administrative boundaries (from the national scale to the smallest administrative units) will be requested from partners. Information on the structure of local Jamoats (local government units) will be requested. The valid planning documents for each administrative division (in GBAO and the city of Khorog) will be requested.

Validation of the data and any assumptions drawn will be required from the relevant government bodies, in a format established with AKAH. The format of the initial meetings with the government will depend on travel restrictions and safety requirements.

2.4. NATIONAL DEVELOPMENT AGENDAS / PLANNING FRAMEWORKS

The initial research uncovered a large number of planning activities, with strategic and technical documentation relevant to the fields of assessment at the national level that are valid for the timeframe of the project. Among them are:

- National Development Strategy of the Republic of Tajikistan for the period up to 2030
- Mid-term Development Programme of the Republic of Tajikistan for the period of 2016-2020
- The National Strategy of the Republic of Tajikistan to decrease natural disaster risk for 2019-2030
- The Programme of Reform of the Water Sector of the Republic of Tajikistan for the period of 2016-2025
- The Programme for Glacier Studies and Protection for the period of 2020 – 2030
- Agricultural Reform Programme of the Republic of Tajikistan for the period of 2012-2020
- State Programme for the Development of new irrigated land and the restoration of disposed land for agricultural use in the Republic of Tajikistan for the period of 2012-2020
- State Programme of Shore Protection Works of the Republic of Tajikistan for the period of 2018-2022
- The Programme for the Improvement of the ameliorative state of irrigated agricultural land of the Republic of Tajikistan for 2019-2023
- Town Planning Code of the Republic of Tajikistan introduced in 2012

The City Profile will include key findings and analysis graphically translated into a set of diagrams to illustrate recommendations and interventions for the GBAO region and the city of Khorog in particular. UN-Habitat will request detailed information on any ongoing activities in the country and region from partners to ensure that any further planning recommendations are aligned with current national priorities and international agendas. UN-Habitat will coordinate with the World Food Programme (WFP) on the Tajikistan Strategic Plan for the period of 2019–2024, the United Nations Economic Commission for Europe (UNECE) on measures in The National Plan to implement recommendations from the national review on housing and land use, and the Organisation for Security and Co-operation in Europe (OSCE) on the Environmental Code of the Republic of Tajikistan. The list of entities identified for potential coordination may be expanded according to the recommendations of the United Nations Country Team (UNCT) at later phases of the project.

UN-Habitat will work in close consultation with the UNCT on the planning frameworks component to produce outcomes in the strategic focus area of "Resilience and Environmental Sustainability", using the current United Nations Development Assistance Framework (UNDAF) agreed between the Government of Tajikistan and the United Nations on 18 December 2015 to reinforce a strong partnership between the Government of Tajikistan and UNCT.

The coordination mechanism between UN-Habitat and UN Resident Coordinator Office (UNRC) has been established at the stage of project document development through the Project Coordination Office for Countries of the CIS, based in Moscow. The Project Coordination Office assisted in the UN Development Account 9th Tranche Project on "Strengthening national capacities for sustainable housing in selected countries with economies in transition", which was implemented in the country with the assistance of the UN Economic Commission for Europe (UNECE).

UN-Habitat will conduct meetings with key representatives from the UN agencies to collect the most recent data relevant to urban development, resilience, gender, economic growth, and recovery. Moreover, information on the ongoing and potential COVID-19 recovery plans will be collected and synthesised with the analysis.

2.5. NATIONAL PLANNING SYSTEM

Since the 1990s, national and local planning systems in Tajikistan have encountered economic and social challenges, driven by rapid governance restructuring, which resulted in the suspension of master plan development. However, since 2001 planning documentation development in Tajikistan has resumed. The initial research identified the steps of master plan preparation and approval, particularly in the context of GBAO, where the planning mandate belongs to the local authority for architecture and urban planning of the Gorno-Badakhshan Autonomous Region. The Central Committee for Architecture and Construction is the state authorised government body responsible for the approval of planning initiatives countrywide. The initial research is built upon measures of The National Plan to implement the recommendations of the Town Planning Code and the national review on housing and land use in the Republic of Tajikistan, developed by UNECE and UN-Habitat in 2017.

The City Profile will illustrate context-specific planning processes, building a comparison with other related contexts, identifying major challenges and gaps in the current planning system, and providing targeted recommendations for implementation mechanisms. The analysis will be carried out by the UN-Habitat Urban Finance team, with legal experts and urban policy experts, leveraging its diverse resources and technical expertise in various contexts, including CIS.

The analysis of planning mechanisms will also benefit from the UN-Habitat Rapid Planning Studio integrated approach that ties together planning, financial frameworks, and legal mechanisms to achieve effective and integrated outcomes. The success of the project outcomes and sustainability of future growth in the city are reliant on the implementation of supporting urban policies and financing mechanisms to ensure feasibility.

As a part of the scoping activities, a series of meetings with the GBAO and Khorog authority for architecture and urban planning and the Central Committee for Architecture and Construction will be requested to validate the conclusions drawn on the planning processes and to ensure the legal recommendations are considered suitable for piloting. The outcomes of the consultations will be presented in the "Implementation Framework" component of the project, which will include the Report on Building Codes and Recommendations.

2.6. MIGRATION CONTEXT

The existing migration data indicated that labour migration plays a significant role in Tajikistan's national economy. In recent years, remittances from labour migrants have accounted for up to 50 per cent of Tajikistan's GDP and are required to finance the country's foreign trade deficit. Working-age men mainly find employment in neighbouring countries, principally in Russia. The 2018 World Bank Country Diagnostic Report suggests that between 600,000 and 1 million individuals migrate each year. The number of women leaving the country as labour migrants has also increased from 11.8 per cent of all migrants in 2010 to 15.8 per cent in 2015.

The City Profile will provide recommendations based on the migration pattern analysis, which includes international migration, rural to urban migration and climate-induced migration. The migration types and their impacts will be explored during the scoping activities (missions/webinars). A series of diagrams will be used to illustrate the spatial impact of migration on the city of Khorog, demonstrating the correlation between migration patterns and the expansion of the urban footprint. Other dimensions of migration (gender disaggregation) will be explored during the participatory workshops (or webinars), ensuring gender balance in the chosen participants.

Recent data on climate-induced rural to urban and international migration will be requested from partners (partner UN agencies, AKAH and local government). Moreover, the project team will ensure community

perceptions on migration are included through the use of a participatory workshop in the "Discovery and Understanding" phase of the project.

2.7. SPATIAL IMPACT OF OUTWARD MIGRATION

Analysis on population growth and migration patterns is important to build an understanding of the spatial impact of demographic change. This can affect the form and function of the major urban cores, and adjacent suburban areas. The trends will be analysed and translated into a series of explanatory diagrams in the strategic analysis of the City Profile reports.

The spatial impact analysis will help to generate a detailed image of the city structure and provide a more "grounded" development forecast to inform the strategic recommendations.

2.8. CLIMATE RISK

Tajikistan is one of the most vulnerable countries in the CIS region to the impacts of climate change and often experiences floods, earthquakes, and landslides. According to previous studies, surface air temperatures have risen, and the high altitude makes the region sensitive to temperature changes occurring as a consequence of climate change. Between the years 1958 and 2012, a temperature increase of 1.0 - 1.2 degrees Celsius was recorded. Climate risk is exacerbated by deforestation in the country, which has led to soil erosion, and the quality of infrastructure (road network, water supply, etc.) has been affected. Unpredictable weather patterns, as well as rising temperatures, will further affect the abundance and quality of water resources, which will be exacerbated by shrinking glaciers and snow reserves.

The challenge of climate risk combined with a growing population and growing demand for water consumption will impact the agricultural sector, affecting predominantly lower-income communities. The project will address these challenges with targeted recommendations on urban development, built on the triangulation of data sets. Data will include the location of the cities (with a focus on Khorog), expansion of the urban footprint, topography, and growth patterns within watersheds. This data will then be used to build potential growth scenario models. Migration predictions will account for climate-induced movement from vulnerable areas.

GIS data on topography and water sources will be requested from partners, as well as recent information on best practices in urban resilience exercised in the country/region/city. Meetings with partner agencies will be held to gather information on the most recent programmes and guidelines on climate change and environmental protection (e.g. The Programme for Glacier Studies and Protection 2020 – 2030, Environmental Code of the Republic of Tajikistan). A meeting with the representative from the Committee for Environmental Protection will be requested.

Fig 5. Mountanious area of Nivodak, May 2021

Fig 6. Area bordering Afghanistan, May 2021

3

REGIONAL/OBLAST CONTEXT

3.1. URBAN GROWTH PATTERNS

When reviewing the urban growth pattern analysis, it is important to consider that Khorog is the only city/urban area in GBAO and the regional administrative centre. The population density of GBAO is distributed extremely heterogeneously due to topography, constituting an average estimated density of approximately 3.3 to 4.0 people/km2 according to various sources. The only urban area in GBAO is of significant strategic importance as the oblast occupies 45 per cent of the national territory.

The regional assessment in the City Profile will provide an analysis of the rate of urban expansion and regional trends (major habituated areas) in correlation with topographic conditions and areas of environmental vulnerability. The analysis will indicate the areas of the greatest potential vulnerability, especially in regards to new infrastructure. These areas will be emphasised in the strategic recommendations.

To conduct this analysis, regional-scale GIS data will be requested from partners. This should include city locations, city-specific and district-specific population data and population forecasts up to 2030, location and footprint of the urban and rural areas, road networks, water sources, flood-risk scenarios and data on major infrastructure facilities (power stations, water reservoirs, transportation nodes/stations, etc.).

Meetings/webinars with the regional-level planning authority and the Central Committee for Architecture and Construction may also be requested to validate the preliminary conclusions, and a technical focal point may be required to manage potential future data requests. Data requests and meetings at this stage will be mediated by AKAH.

3.2. LOCATION & CONNECTIVITY

GBAO has the lowest levels of connectivity measured by road density and market accessibility in Tajikistan, according to World Bank studies. However, the geographical location of GBAO is strategically important as it provides a transit connection between the Pamir and Fergana Valleys. After the opening of the Murgab - Kulma – Karakorum, and Kulyab - Darvaz highways in 2007, it also links Tajikistan with China in a way that is faster than through the West Pamir highway that runs along the banks of the Pyanj. GBAO can perform as a transit hub connecting China, the Indian subcontinent and Central Asia.

The regional assessment in the City Profile will include an accessibility/drivability analysis from the major centres within the region, particularly from Khorog, to provide accessibility estimates between Khorog and the rest of the region/county, taking into account approximations of road quality. The accessibility analysis will indicate vulnerable areas, which will be targeted for strategic interventions. The profile will include (if the data permits) the second scenario analysis, showing the potential for improved accessibility with upgrades of the selected /planned roads.

Regional-scale GIS data will be requested from partners to assess infrastructural components of accessibility such as international and local airports, road networks and road hierarchy, and georeferenced information on major infrastructure projects (subject to availability).

A meeting with the national and regional planning authority may be requested through AKAH to facilitate an information request on the regional security situation, cross-border dynamics impacting inter-regional connectivity, and travel times, cost and means of transport from the city of Khorog to other major destinations. This information is subject to further exploration during the participatory workshop with the community.

3.3. SOCIAL & DEMOGRAPHIC CONTEXT

GBAO is the poorest, most sparsely populated and most geographically remote province of Tajikistan. It suffered significantly during the civil war, and is affected by cross-border dynamics and various socio-political challenges. The national poverty statistics states that 39 per cent of the population in the GBAO live in conditions of poverty. Poverty in the region is exacerbated by some of the lowest rates of access to basic services in the country, with few toilets inside houses, and limited provision of piped water and sewerage. The lack of effective state-led development programmes is especially visible in the GBAO, where many individuals depend heavily on external aid.

The City Profile will include a contextual social and demographic study with population distribution analysis across the region, correlated with environmental vulnerability data and income level to illustrate the spatial distribution of development trends and position the city of Khorog within the socio-economic dynamics of the region.

The regional GIS data on population and income level per district/smallest administrative unit will be requested to produce a population density and income heat map overlayed with hazard risk information indicating environmentally vulnerable areas.

The meeting with representatives from regional and national planning authorities will be required to ensure the most recent data and statistics are used in these studies.

3.4. LAND USE PATTERNS

According to the scoping research, the GBAO is largely dominated by the land category of “bare soil & rock surface”, which accounts for approximately 65 per cent of the total land area. Due to climatic conditions and topography, GBAO is the least agriculturally productive region, with negligible endowments of cultivable land. Irrigated lands are scarce in GBAO. There are 1522ha of irrigated lands in Vanj, 4426ha in Ishkashim, and 2121ha in Shughnon that receive water from the Gund and the Panj Rivers. The significant amount of uncultivatable land and scarce water resources are critical factors to focus the regional strategy on efficient land resource management. The challenge of limited land resources, coupled with the strategic location of GBAO and the city of Khorog situated on the link with China indicates that the new sectors of investment should be explored. Of particular interest will be the tourism sector, which could take advantage of this strategic connection and magnificent landscapes to expand the urban economy. The administrative centre in Khorog can also be developed further.

The land use pattern analysis will provide a technical base for strategic recommendations, ensuring the security of natural resources. The GIS analysis will be conducted on the basis of the most recent data.

To facilitate this analysis, the most recent google imagery will be utilised and regional scale data will be requested on forest coverage, vegetation, mountains, valleys, agriculture, urban footprint, water sources and any relevant surface data. Data on protected areas (e.g. The Tajik National Park in GBAO’s Pamir Mountains - UNESCO World Heritage Site, national parks, etc.) will also be requested.

Close collaboration between technical experts and data exchange is anticipated to facilitate the land use analysis.

3.5. ECOLOGICAL FRAMEWORK

Natural resources such as water, forests, arable land, pastures, and wild animals are highly sensitive to climatic parameters, meaning that climate change can have a potentially severe impact on natural resources in GBAO and on the people who rely on them. Over the last 50 years, the annual average temperature in GBAO has increased by up to 1.2°C. Climate projections indicate that it could rise further, reaching a level of up to 2.9°C higher than that of the 1961-1990 period by 2050.

The ecological framework will be expanded in the City Profile, providing useful information for strategic interventions at various scales (regional – city – neighbourhood). Data on environmental programmes mobilised by partner entities and active agencies in the country and region will be analysed (e.g. Pilot Programme for Climate Resilience (PPCR), Regional Programme “Sustainable Use of Natural Resources in Central Asia”, initiated in 2008 (GIZ), etc.), with a snapshot of the key recommendations and forecasts.

Recent information on the process of deglaciation and seasonal shifts in river levels will be requested and used

to assess how this will influence water availability in the region. Geographic data on vegetation and agricultural land cover changes will also be requested to analyse the trend of agricultural degradation. Flood scenarios, water sources and arable land information are critical datasets to produce analysis that can identify the main limiting factors for agricultural development.

Data exchange and close collaboration between technical experts is anticipated. The participatory workshop with the communities will be crucial to expand the data on climatic conditions and energy supply in both urban and rural areas.

3.6. URBAN & RURAL ECONOMY

According to Word Bank research on lights and irrigation coverage, economic activity in GBAO is relatively low, and there are accessibility challenges caused by the steep terrain. Economic challenges have been exacerbated by political transitions in Tajikistan. After the country gained independence in the early 1990's, The economy of the Gorno-Badakhshan Region collapsed, and it faced a severe shortage of most basic everyday goods. A very small percentage of people in select communities are in public-sector employment. These are schoolteachers, health workers, forestry workers, Jamoat administration workers, etc. Very often, remittances from family members working abroad, mainly in the Russian Federation, account for the majority of family income. The GBAO is still reliant to a degree on international humanitarian aid and development assistance through the Aga Khan Development Network (AKDN).

The City Profile will provide an analysis of economic activity within the region, based on the connectivity of Khorog with the major market centres, large scale commercial hubs, to identify limitations and barriers to regional economic growth and potential for further economic development.

Information on the sectoral distribution of economic activities and Income levels in GBAO and neighbouring regions will be requested. More detailed information on current initiatives (e.g. cross-border markets sponsored by international donors) for economic development and lessons learned will be required to provide the most recent overview of ongoing practices. Information on the market centres is crucial to demonstrate the economic dynamics of GABO and the strategic positioning of Khorog.

Alongside the requested data exchanges, a meeting/ webinar with relevant stakeholders in the economy and investments will be required, mediated through AKAH. Economic opportunity will be disaggregated by gender and youth engagement will be analysed during the participatory workshops to identify employment challenges, ensuring gender balance of the participants and presence of youth.

Fig 7. High - rise residential block under construction, May 2021

3.7. EXISTING AND PLANNED INFRASTRUCTURE

Tajikistan's infrastructure can be characterised as relatively poor, which contributes to very high trade costs that restrict the country's access to nearby markets such as the People's Republic of China, Afghanistan, and the Russian Federation, a major export destination. However, initial research indicated overall improvement trends in infrastructure due to a number of ongoing and completed projects. Tajikistan ranks 114 of 160 countries included in the World Bank Logistics Performance Index. In 2014, Tajikistan received a score of 2.53, compared with 1.93 in 2007 when it ranked 146.

The identified infrastructure projects within the GBAO region are predominantly focused in the transport and energy sectors. More detailed information (georeferenced) will be requested to outline the major areas of investments in the region and ascertain how the strategic interventions can contribute to ongoing initiatives. Spatialised information on investment projects will assist in identifying partner agencies and donors to be matched with regional governments to ensure the investments are targeted in a sustainable manner and in line with the national and regional priorities for urban development.

3.8. DEVELOPMENT POTENTIAL

Concluding the component on the strategic analysis, a visioning workshop with stakeholders (representatives from the regional and local government, representatives from the partner entities and communities) will be conducted to present the initial findings on development challenges and opportunities for validation.

The visioning workshop will involve a Rapid Planning Studio to collect technical inputs from the project team, development group stakeholders and the community. This will ensure evidence-based decisions regarding development priorities.

Due to travel restrictions caused by the COVID-19 outbreak, the format of the workshop may be reconsidered and a webinar with collaborative mapping tools facilitated by the allocated moderator will be recommended.

Fig 8. A view on the river in the central area of Khorog, May 2021

4

CITY CONTEXT

4.1. LEGISLATION & GOVERNANCE STRUCTURE ASSESSMENT

For this thematic area, information on planning functions and mandates of the Khorog City Mayoralty and the process of plan development and approval at the local level will be requested. Alongside the information request, a meeting with representatives from the local government and local planning authority (e.g. Architects Office) will be required. The meetings will be requested upon the consultation with/recommendation of the AKAH. Considering the significant role of the Aga Kahn foundation in the city, mapping of the foundation's ongoing initiatives in Khorog will be conducted.

4.2. PREVIOUS/CURRENT PLANNING FRAMEWORKS AND UNIFICATION OF DEVELOPMENT GOALS

A unified development framework and strategic plan for the city that integrates and acknowledges existing initiatives by local authorities, AKDN, and non-governmental bodies, was not identified in this initial phase of research. A centralised mechanism for the management of initiatives and knowledge-sharing is also not apparent. With the exception of independent studies, development project documents and citywide plans are not available in the public domain.

The City Profiling Tool (1.1.2 City and Regional Assessment Outputs in the project outline) will provide a cross-sectoral analysis to inform a development framework and a series of citywide strategic plans. Approaching the comprehensive strategy at the city scale will enable multi-faceted challenges to be addressed in a unified way, ensuring efficient implementation of sustainable outcomes.

Not only can this process unify existing data, integrate outcomes from existing initiatives, and consolidate the goals of diverse stakeholders, it can provide an exemplar and foundation for an integrated approach to planning for the city. Providing clarity on the city development strategy may encourage non-governmental initiatives, with an improved understanding of - and alignment with - regional and citywide goals, as well as knowledge sharing and collaboration between existing stakeholders. A development framework will support a more streamlined system of management and governance for all city initiatives looking forward.

A meeting will be conducted with the local planning authority, as well as, or in tandem with representatives from the AKDN, to clarify the process of regulation or management of proposals for non-governmental development initiatives and identify all existing development strategies initiated and implemented by the local authority and AKDN. Information on planned infrastructure developments on the local scale will also be requested. The information acquired in this meeting will be used to elucidate the existing processes of alignment between the AKDN and citywide development strategies of the local authorities.

4.3. UNITED NATIONS OFFICE FOR DISASTER RISK REDUCTION FRAMEWORK ANALYSIS IN RELATION TO THE EXISTING CONTEXT

The role of the United Nations Office for Disaster Risk Reduction (UNDRR) is based on the implementation and review of the Sendai Framework, in tandem with the Paris Agreement on climate change, the New Urban Agenda, and SDG's related to climate change and risk resilience. The UNDRR's main objective is the prevention and reduction of disaster risk and strengthening resilience with multi-hazard disaster risk management.

Although this is not a component of the initial research phase of this project, the UNDRR framework will play a key role in the City Profile reports as it will be used to operationalise global standards and goals in the national, regional, and local context of the project. Inter-agency collaboration with the UNDRR will ensure that risk resilience is considered central to the project analysis and its outcomes.

4.4. SOCIAL AND DEMOGRAPHIC CONTEXT AND MIGRATION

Data on predicted population growth, migration (seasonal and regular cross-border patterns), and localised socio-cultural divides within the city was limited. Localised information of this nature was found to be unreliable. One challenge that has been highlighted during this initial research is a potential growing mismatch between the provision of facilities, employment and the growing youth demographic in the city. Another challenge is the integration of diverse socio-ethnic groups in the city, particularly considering the potential demographic impact of development projects such as the University of Central Asia (UCA) and the Chinese Embassy.

The project will address this issue by consolidating existing socio-demographic data and providing demographic growth predictions in a forecast assessment (20-year forecast assessment of the project outline), applying this information to the neighbourhood-level analysis, and by basing spatial plans, strategies, and zoning guidelines on current, comprehensive information.

The outputs of this project will, therefore, include crucial, consolidated information that can be used in further future initiatives and will ensure appropriate and effective outcomes.

Alongside a data request, a meeting with local planning authorities and local communities will provide a more spatially specific, detailed, local understanding of socio-spatial segregation and demographic patterns within the city. This will help to highlight any gaps in service provision for both current and projected populations on a local scale. Finally, input from the local planning authority about future planning projects that will affect the demographic profile of the city will raise the accuracy for the next phases of the project that will determine long-term spatial strategies and action plans.

4.5. CLIMATE CHANGE RESILIENCE AND RISK MAPPING

The initial research on climate risk resilience in Khorog highlights the lack of reliable, accurate and unified data on this theme in this region. Considering the immediacy and wide-scale impact of natural disasters and climate change on the population of Khorog, the lack of data presents a key challenge for the city. Although there are numerous initiatives (for example, FOCUS, Mountain Societies Development Support Programme, Hazard Vulnerability Risk Assessment etc.) and assessments for climate risk and resilience, these are led by AKDN (primarily through the Mountain Societies Research Institute) and independent bodies. A centralised system for management and governance of these initiatives is unclear, and there is no database for unified knowledge-sharing that is publicly accessible. Finally, although climate change resilience is mentioned as part of specific development programmes within the city (for example, the City Park), there is no apparent city or regional-scale strategy for development within a framework of climate change resilience. This presents a challenge to controlled future urban growth, which requires regulations that are based on a detailed understanding of risk and degradation to key infrastructures and distribution of economically and climatically vulnerable communities.

This project will use a Planning Legislation and Governance Structure Assessment to identify capacity gaps and legislative requirements of the city in sustainable urban development and resilience planning. This will be important to build on the capacity-building programmes that already are in place, and more effectively bridge these gaps through technical training activities. It will also use project indicators based on the United Nations Office for Disaster Risk Reduction Framework, tailoring the framework to the city context to produce the spatial recommendations and guideline outputs. Climate resilience underpins each stage of the project outputs. It is a feature of the analysis in each phase of the project as well as a specific component of the planning and design recommendations.

A meeting with local planning authorities will be requested to identify any existing processes for managing and systematising climate change and resilience studies, and any mapping, data collection and physical projects being undertaken in the city. Additional stakeholders may include The Committee on Emergency Situations and Civil Defence, The Committee for Environmental Protection, The Departments of Geology, Hydrometeorology and Seismology, and local community representatives as is appropriate.

4.6. BLUE AND GREEN NETWORK

The analysis of the blue and green network will include the system of green areas within the city of Khorog and all water resources (rivers, lakes, etc.). It is paramount for the future development of the city that the importance of protecting and enhancing the blue and green natural infrastructure and its potential harmonious integration in the urban system is understood. Protection and restoration of natural features can facilitate resilience and community well-being.

Reinforcing natural systems, agricultural land, and integrating blue and green networks with the urban fabric, functionally and spatially, will foster balance between the built and natural environment.

Geographic data on the urban footprint, vegetation distribution and water bodies within the city of Khorog will be requested.

4.7. TRANSPORT AND CONNECTIVITY

Research suggests that regional connectivity is a potential asset for the city that is currently hindered by poor infrastructural quality and management. Data on formal and informal transport is lacking. Furthermore, a transport strategy has not been found to exist in the public domain. There are, however, a number of projects planned by different stakeholders and at various scales. Examples of this include new construction and extended maintenance of roads by the AKDN through the UCA, and the Wakhan national-scale road project.

Challenges in transport and connectivity will be investigated further in the City Profiling exercise and will include a 20-year forecast assessment, a Planning Legislation and Governance Structure Assessment, and an Infrastructure Investment Assessment. These tools and assessments will build a stronger spatial, financial and capacity-based analytical foundation into the diagnosis phase. The scoping phase of this project will assess existing projects in local and regional transport and maintenance to inform a sustainable transport strategy that will acknowledge forecasts on transport use and requirements for financial efficiency. A consolidated strategy for transport will retain consistency across project scales, ensuring service provision is evenly distributed over municipal boundaries.

Data will be requested on transport infrastructure, use, and cost, and a meeting will be held with relevant stakeholders, including the transport authority for the city and region and representatives from the AKDN or UCA. The meetings will be used to ascertain investment strategies for transport infrastructure and maintenance, to identify additional challenges and any misalignment within the frameworks of governance for transport programmes.

4.8. BASIC URBAN SERVICES

Basic urban services appear to be a key challenge for the city of Khorog. These services lack resilience to climate risk and natural disasters, and many areas of low socio-economic means lack access for personal and agricultural use. Many services are reliant on climate conditions that are prone to flux and likely to be affected by climate change. From initial research, it is apparent that energy provision is unsustainable as the high reliance on hydropower makes supply contingent on seasonal conditions and impacts costs. The negative of environmental instability in the high altitude region is compounded by political instability created by reliance on water sources located on the border with Afghanistan. Currently, energy reviews are based on regional data and will need to be desegregated to generate a more accurate understanding of basic urban service distribution in the city.

This project will outline the existing and future challenges to service distribution in the city to generate guidance on sustainable future provision. In particular, the Infrastructure Investment Assessment will provide a more feasible and cost-effective strategy by which to improve and build upon existing urban services. Scaling up project recommendations will bridge the gap between regional and citywide basic services, integrating needs at both scales to eliminate municipal divides in provision. Small-scale neighbourhood analysis will provide a detailed understanding of the existing pattern of provision to inform an evidence-based forecast.

Alongside numerical data indicators, more spatially specific information regarding the citywide distribution of energy supply will be collected in a meeting with local planning authorities to determine potential access limitations. This will be assimilated with data on other basic urban services such fresh water, sanitation, "blue and green infrastructure", social infrastructure and public services.

4.9. WATER, WASTE AND SANITATION MANAGEMENT

A number of planning components were discovered as lacking in the area of water supply and waste management. These included a clear framework for management and governance, an investment plan, and a detailed spatial infrastructure overview. Notwithstanding recent improvements and initiatives, water supply is lacking in the city and is not affordable for all. This constitutes an important challenge that may be exacerbated with the city growth if not addressed.

The Infrastructure Investment Analysis provided in this project will guide a more financially efficient implementation strategy for urban basic service provision, using demographic and spatial forecasting. Furthermore, the Planning Legislation and Governance Structure Assessment will identify any bottlenecks or capacity gaps that might be inhibiting sustainable water and sanitation provision. This will account for political and geographic challenges associated with the position of the region and water ownership.

Current, detailed information on existing infrastructure, programmes and management frameworks will be gained through a data request and meeting with local authorities and the Architect's Office. This will inform the diagnosis phase.

4.10.SOCIAL INFRASTRUCTURE AND PUBLIC SERVICES

There are many education facilities in the city for students of all levels and training for adults. There is also a strong presence of health facilities and religious and community spaces, predominantly through the UCA and AKDN. From initial research, there seems to be a high level of social infrastructure and public services. There are some heritage sites, and cultural activities are encouraged to some degree.

This project will investigate physical, financial, and social access barriers to social infrastructure through workshops and spatial mapping to establish hard data and perceptions. Using the project indicators and evaluation tools, workshops and community engagement will follow inclusivity and participation targets to ensure that community engagement in the planning process is effective, that representation in the workshops is appropriate to the context, and that needs are expressed and acknowledged in a meaningful way, with particular importance placed on vulnerable groups. A walkability assessment will ensure that access to public services is addressed in a way that considers citizens of all means. The spatial strategy and citywide design guidelines will ensure that the distribution of social infrastructure and public services is spatially equitable and that provision is of an adequate quality for the needs of the current and projected city population. It will also protect and build upon existing cultural programming and heritage sites.

A meeting with the Local Planning Authority will be requested to identify gaps in service provision and management that will require addressing in a future plan to prepare for effective and equitable urban growth.

4.11.LOCAL ECONOMY

Historically, the local economy of Khorog seems to have been supported primarily by the state; however, research suggests a more recent emphasis on encouraging private-sector businesses. These are, in part, found to be promoted in projects of the AKFED (Aga Khan Fund for Economic Development) and large institutions such as the UCA. For example, projects in mobile phone services and the energy sector have been established or supported with financing from the AKF (Aga Khan Foundation), who are also key employers in the region. City markets and cross-border trade support the local economy of Khorog, though local trade management may require addressing to safeguard from exploitation and monopolies.

Numerical and spatial data on markets will be requested, as well as meetings with local planning authorities. These will be used to establish any barriers to local economic growth and opportunities to leverage a growing population with a large working age demographic.

4.12.SOCIAL AND RELIGIOUS SERVICES

The Ismaili Jamatkhana Centre is a large religious site that also provides community spaces and a library. There is not much information regarding smaller, less formal religious practices within the city or community-led religious or non-religious meetings.

The stakeholder meetings and workshops will help to identify social, financial and spatial challenges to access of religious service, and this will be integrated into the City Profile and mapping exercises to inform spatial recommendations and zoning guides at the neighbourhood level. A walkability assessment of existing religious infrastructure will be undertaken.

4.13.MOBILITY PATTERNS, CONNECTIVITY, WALKABILITY

The regional connectivity appears to have been prioritised in GBAO, which is reflected in the well-structured regional routes that cut through the city (North to South, with connections across the bridge). Although the city is relatively small, walkability is hindered by low permeability as routes are disrupted by fragmenting parcels of underutilised land or bridgeless sections of the river. Large, regional roads and stretches of the river that lack a pedestrian-friendly, green urban design strategy can create barriers for pedestrian use and damage inter-city mobility. Low urban density can lead to unplanned pathways with low-quality infrastructure. Small infrastructural provisions that improve the walkability of the city (such as trees and lighting) are in place throughout the city. However, new connections must be established between key nodes of the city, in expectation of city growth and with consideration of climate change and disaster risk.

The mobility patterns and walkability of the city will be further investigated using additional data collection and mapping in the Infrastructure Investment Assessment and neighbourhood-level analysis of the city profiling exercise. This process will isolate specific areas of focus from a broad body of data and ensure a fuller understanding of the diverse challenges associated with urban mobility. This evidence-based approach will form a basis from which to approach workshops and stakeholder meetings in which diverse perspectives can be gathered to prioritise challenges on the basis of resident and authority needs. Of particular importance will be the needs of women, children and those with disabilities to ensure that the city and its resources are accessible to all.

Data requests will facilitate an accessibility analysis in this thematic area.

4.14.HOUSING, LAND AND PROPERTY (LAND OWNERSHIP ANALYSIS)

The Housing Land and Property (HLP) component will include analysis of legislative and regulatory frameworks, principle documentation on land registration, civil codes, land codes, and relevant decrees. Recent donor-supported programmes will also be analysed (e.g. Land Reform and Farm Restructuring Project (LRFRP), Access to Justice (A2J) Programme, World Bank Land Registration & Cadastre System for Sustainable Agriculture Project, etc.).

The HLP component closely intersects with the migration and gender studies as the phenomenon of long-term overseas labour migration has a direct impact on gender roles and responsibilities at the household level.

Fig 9. Vegetation along the riverfront in the central area of Khorog, May 2021

Equal representation of gender perspectives and of people with disabilities will be sought with participatory workshops and used to analyse the ways in which gender stereotypes and socio-cultural traditions influence the local interpretation and application of land legislation. According to the initial research, women and people with disabilities are still considered vulnerable for a range of reasons, making it challenging to benefit from tenure security.

4.15.URBAN FABRIC AND URBAN MORPHOLOGY

The spatial character of a city is defined by structural elements, fabric morphology, and density distribution. The City Profile will analyse the urban morphology of planned and unplanned, central, and suburban areas to demonstrate physical characteristics and identify any areas of cultural and historical significance that can be emphasised in the detailed demonstration projects to promote local identity and culture.

Information on housing typologies will be requested for analysis. Detailed analysis of residential space functionality will be conducted in the participatory workshops with communities.

4.16.PUBLIC SPACE PATTERNS

There appears to be a high number of public spaces in Khorog, of diverse type, scale and purpose. Typologies include both formal and informal public spaces such as tree lined streets and large development projects with green public spaces. The latter includes the Ismaili Centre, City Park, and the Botanical Gardens. Public space programming is, therefore, also diverse. Some spaces may be defined by unplanned or spontaneous programming, such as areas of informal transit or trade. The quality of public spaces within the city is variable, and further analysis may highlight spatial discrepancies or disbalances in access levels. A more integrated approach to the public space strategy for the city may prove effective in addressing challenges associated with climate change and equality. Climatic variability does not necessarily rule out public use of green or open spaces. For example, the water edge and flood-prone areas of the city can provide public space at certain times of the year.

The strong focus of this project on climate resilience will identify capacity gaps to be addressed in technical training activities. This will be supplemented with stakeholder meetings and workshops with community groups that will feed into a spatial strategy and participatory design workshop. These activities and outputs will guide public space creation and management in an equitable way that effectively integrates climate resilience strategies. This guidance may also be extended through demonstration projects and catalytic interventions as exemplars that can be scaled up. Therefore, this project will approach adequate and accessible public space within the city through a detailed approach that is both local and citywide, with a focus on climate resilience. Through citywide assessments, the project will provide recommendations for spatial strategies and zoning guidelines and detailed design interventions to ensure that public spaces are inclusive, effective, and responsive to need.

A meeting with the Local Planning Authority and AKDN will be used to indicate any existing strategies in open and public space provision or improvement, and to elucidate the extent of public space integration into the existing Town Plan or/and Masterplan of the city. This meeting will also be used to identify cultural or social barriers to public spaces, governance or management challenges to existing programmed public spaces, or any use patterns that may require specific workshops to expose further. Contact with additional stakeholders, such as parks management, sanitation, or security providers, will also be sought to expand the scale and thematic scope of the investigation.

4.17.ANALYSIS OF CURRENT INFRASTRUCTURE

According to recent information from AKAH, the Government of GBAO and their partners have commenced construction on a critical social infrastructure plan in the city of Khorog. A total of nine infrastructure projects to be constructed include 6 playgrounds across the town, 5 secondary schools on Saidmir Abdurahmonov Street, a water supply system for the Bizmich settlement, and Riverbank protection in the Sharifobod area. The projects were selected by local communities.

Georeferenced information on the ongoing and planned projects and data on the projected capacities of new infrastructure will be required. The city profile will consider the ongoing projects in the citywide strategic recommendations and selection of targeted areas for demonstration projects.

4.18.CITY STRUCTURE AND NEIGHBOURHOOD CONTEXT

The continuity and extent of the city structure are limited by the natural and topographic features. Data regarding infrastructure and land quality has not yet been assessed; however, city extension strategies and

planning policy must address climate change impacts and consider existing informal construction.

Legislation on land and housing rights will be pertinent to the spatial growth of the city. The city appears to have a low density, in which case urban densification may prove to be an opportunity for further development. The city appears to possess an economic and administrative core containing local authority facilities. However, accounting for population growth, connectivity to new institutions such as the UCA or the Chinese embassy must be addressed in the city structure and projected growth patterns, as current and future planned institutions such as these may provide the structure for secondary nodes in the city.

The city structure analysis will require specific data on the current conditions of the city, which will be requested and supplemented in a 'workshop for understanding the city'. The data will contribute to the neighbourhood-level analysis and future growth analysis. This will guide the citywide spatial strategy and zoning guidelines, which will be integrated with findings from the workshop, confirmed through the validation workshop. The Planning Legislation and Governance Structure Assessment and Municipal Finance Assessment will play a major role in addressing the potential risks associated with land management and informal growth. Therefore, this project will address challenges associated with the city structure and growth with a database that is strengthened by participatory inputs and integration with legislative guidance.

4.19.COVID-19

As the government of GBAO is independent of the rest of Tajikistan, due to the changing COVID-19 situation, travel permits can be suspended at short notice. From a source updated on the 18th September 2019, the country had 75 confirmed deaths and 9,605 total cases (including active). Khorog had 1 confirmed death and 18 cases. Large gatherings have not been suspended, but foreign travel into the country has been suspended. This includes air travel and terrestrial border crossings; however, six crossing points with Kyrgyzstan and Uzbekistan remain open for cargo. Food shortages are minimal, and petrol prices have decreased.

This recent but impactful global challenge will form part of discussions with local stakeholders, including community and government officials, to better understand the potential onset and longer-term impacts of COVID-19, not only in terms of health but also for employment and social stability. Data regarding recovery will be collected and synthesised as part of the wider analysis.

Fig 10. Development along the riverfront and a pedestrian bridge in the central area of Khorog, May 2021

Fig 11. The central market and adjacent parking in Khorog, May 2021

5

LOOKING FORWARD

The initial summary of development challenges and opportunities are provided below, focusing on the city of Khorog. These will be explored further during the scoping activities (webinars, meetings, field missions, etc.) to construct a clear framework for strategic interventions and detailed urban design projects.

6

DATA REQUESTS & ACTIONS NEEDED

The required spatial data (GIS and AutoCAD) and supplementary information is summarised in the following table to share with the technical project team.

Challenges	Opportunities
Strategic	
Exposure to natural disasters, high index of environmental vulnerability coupled with climate change, agricultural degradation, lack of arable land.	Touristic potential, picturesque landscapes, unique natural landscapes and cultural identity.
Lack of reliable unified data, no consolidated framework for regional and city climate and disaster risk resilience, nor a unified strategy for diverse projects and initiatives, lack of regional spatial strategy.	Abundance of studies and research by various NGOs and international organisations. AKAH and UCA provide a solid base upon which to build strategies and identify gaps.
Institutional	
Lack of clear strategic vision caused by the centralised governance system (this is a preliminary deduction that will be investigated further).	International organisations are empowered; AKDN especially has a critical role with some government functions.
Urban Services and Infrastructure	
Energy provision is heavily dependent on Hydro Power which presents challenges in finance and management, limitations in energy consistency and employment provision, and challenges in political and environmental sustainability due to location and seasonal environmental susceptibility of water sources. The Khorog energy review is based on regional data.	The location of GBAO in a transit territory that provides a connection between the Pamir and the Fergana Valley along the trade route between Tajikistan and China is strategically important. The modern highway Kulyab - Kalai Khumb - Murgab – Kulma is practically restoring one of the main branches of the Great Silk Road. Growing trade relations may facilitate economic development in the city.
Projects to improve water supply are not unified in an overarching framework or governance structure. Notwithstanding recent improvements and initiatives, water supply is lacking and not affordable for all.	A number of investments and general trend in infrastructure improvement.
Generally, poor quality of infrastructure, exacerbated by environmental vulnerability and climate change.	The University of Central Asia in Khorog is a driver of local and regional development, with a high capacity and knowledge base.
Challenges	**Opportunities**
Socio-economic	
Lack of data and potential social and political disconnect between communities and authorities.	High level of migration can improve empowerment of women (requires study).
Growing youth demographic coupled with high unemployment.	Existing infrastructure, high professional capacity and high quality and capacity of education centres can be exploited.
Spatial	
Insufficient level and quality of transport, maintenance and management.	Wide range of public spaces both undeveloped and formal. There is substantial vegetation, and some street lighting.

Table 3. Initial summary of development challenges and opportunities for Khorog

The city has low permeability due to poor infrastructure, and the urban fabric is fragmented.	More use of the riverside may be of benefit to the city. Flood prone areas (e.g. to the west of the city near the river) could be used as green public space and for flooding management.
The city has a linear structure with a major central node; however, a new node emanating from the UCA construction may encourage city extension to the northeast, which could lead to fracturing and encourage urban encroachment onto unsuitable land.	A linear structure can work in an efficient manner once a well-functioning system of public transportation is in place.

Thematic area		GIS data	"Soft" data, planning documentation	Stakeholder meeting	Community engagement
National Scale	**National & International Setting**	• Location of cities and major settlements population data per city – current - *Numbers should be the most recent and match official documents (census, plans, etc.)* • Population data per city - forecast - up to 2030 • Topography - contours lines/hill • Major roads (national highways) and railways (line length) *Dataset should be visualised in lines* • Airports - *Dataset should be visualised in points* • water bodies (rivers, lakes, etc.) *Dataset should be visualised in polygons*	• Current population rates		
	Administrative & governance system – brief overview	• Administrative boundaries (from national to smallest administrative units) - *Spatialised data must be most recent*	• The structure of Jamoats as the smallest scale representative body at the communal level	• Validation of the local governance structure diagram	
	National development agendas/ planning frameworks		Key documentation, nationwide strategies in urban development and resilience State Labour Market Development Strategy Poverty Reduction Strategy		
National Scale	**National Planning system**		• Description of the plan approval process at regional and local levels (GBAO, Khorog) • Planning documentation available at the national, regional, district, and city scale	• Meeting with the central office of the Committee for Architecture and Construction • Meeting with local authority for architecture and urban planning of the GBAO region • Meeting with local government planning authority of Khorog	
	Migration Context		• Recent data on climate induced rural to urban migration and international emigration		+
	Climate risk		• Best practices on urban resilience in the country, region, city. • Information on the most recent activities in programmes on climate change and environmental protection		+

Thematic area		GIS data	"Soft" data, planning documentation	Stakeholder meeting	Community engagement
Regional Scale	**Urban Growth Patterns**	• Location of cities and settlements (villages), population data per city and village – current and projected population - *Numbers should be the most recent and match official documents (census, plans, etc.)* • population data per city and village – forecast up to 2030 • topography (contour lines/hill shades) • Hierarchy of road network - *Dataset should be visualised in lines* • urban footprint - *Dataset should be visualised in polygons* • Infrastructure facilities (power stations, water reservoirs, transportation nodes/stations, etc.)		• Meeting with planning authority of GBAO	
	Location & onnectivity	• Road network (classified) - *Polylines need to be connected, otherwise the analysis won't run. Right of Way in the attribute table* • Airports (international and local) • Information on major infrastructure projects within the region	• Travel time and cost from the city of Khorog to major destinations (Dushanbe, etc.) • Information on security situation in the region		+
Regional Scale	**Social & Demographic Context**	• Population per district/smallest administrative unit – current – *Numbers should be the most recent and match official documents (census, plans, etc.)* • Population per district/smallest administrative unit – forecast up to 2030 • Income level per district - *Numbers should be the most recent and match official documents (census, plans, etc.)*	• Current population rates for the region		+
	Land use patterns	• land use patterns -forest coverage, vegetation, mountains, valleys, agriculture, urban footprint, etc. *Dataset should be visualised in polygons* • Protected areas			
	Ecological Framework	• Vegetation change over time *Dataset should be visualised in polygons* • Land cover change over time	• Current Regional environmental Programmes and initiatives		
	Urban & Rural Economy	• Income levels within the region, per district/smallest administrative unit - *Numbers should be the most recent and match official documents (census, plans, etc.)*	• Sectoral distribution of economic activities and Income levels within the region/ per district		
	Existing and Planned Infrastructure	• Planned major infrastructure projects (by sectors: Roads, Railways, Energy, Water) - *Dataset should be Visualised in polygons or points* • Major infrastructure projects under construction - *Dataset should be Visualised in polygons or points*			

Thematic area		GIS data	"Soft" data, planning documentation	Stakeholder meeting	Community engagement
City Scale	**Legislation & governance structure assessment (city governance)**		• Information on administrative roles and functions/the structure of Khorog Khukumat		
	Previous/ current planning frameworks and unification of development goals	• A Master Plan for the city of Khorog (GIS or AutoCAD) • Strategic City Plan and Zoning Proposal (GIS or AutoCAD)	• A Master Plan for the city of Khorog, • Strategic City Plan and Zoning Proposal • AKF 'Development Control Report'	• Meeting with Khorog planning authority	
	Social and Demographic Context and Migration	• Population density (per neighbourhood) and/or population numbers per neighbourhood - *Numbers should be the most recent and match official documents (census, plans, etc.)* • Spatial information on demographics and household types • Spatial information on ethnicities	• Current population rates • Existing management of density/strategy • Current migration rates (if exists) • Predicted migration rates (if exists)	• Meeting with Khorog planning authority	+

Thematic area		GIS data	"Soft" data, planning documentation	Stakeholder meeting	Community engagement
City Scale	**Climate change, resilience and risk mapping**	• Resilience (ex: rainwater channels) - Length, depth, capacity, quality status - *Dataset should be visualised in lines or points* • Topography, contours / hill shade (5m apart, with elevation levels) – *Dataset should be visualised in polylines* • Rainfall (ml per sqm) - *Dataset should be visualised in points* • Land cover, soil type, vegetation • types - *Dataset should be visualised in polygons* • Temperature (Fahrenheit or Celsius) - *Dataset should be visualised in polygons* • Vegetation • Water sources / watersheds (Area) - *Dataset should be visualised in polygons* • Flood scenario (Area) - *Dataset should be visualised in polygons* • Climate resilient infrastructure • Landslide (Area) - *Dataset should be visualised in polygons* • Soil type (Area) - *Dataset should be visualised in polygons* • Snowslide (Area) - *Dataset should be visualised in polygons*	• Natural disaster rate – floods, landslides, snow slides • Spatial and quality data for climate resilient infrastructure • Information on water basins, green and blue network • Rainfall and temperature data over time • MSRI consolidated report/data sets/ strategy and project outcomes • Consolidated AKF strategy for climate resilience	• Meeting with Khorog planning authority	+
	Blue and Green Network	• Water bodies + all vegetation types (Area) - *Dataset should be visualised in polygons*	• Action plan of Environmental Protection Department of Khorog City • Existing quality assessments	• Meeting with Environmental Protection Department of Khorog City • Meeting with University of Central Asia on "Going Green" initiatives	+
	Transport and Connectivity	• Existing road network (classified: primary, secondary, tertiary) • Length, Width - *Polylines need to be connected, otherwise the analysis won't run. Right of Way in the attribute table* • Planned road construction projects (local) • Public transportation lines - *Dataset can be visualised in plots or points*	• Travel cost from city centre to the outskirts and major attraction points, other settlements, etc. • Formal public transport networks (cost, maintenance and management) • Informal public transport networks	• Meeting with Khorog planning authority	+
	Basic Urban Services	• Energy infrastructure	• Information on energy consumption vs production (current data) • Energy projection report – Tajikistan Geospatial Electrification Analysis Organisation • Household energy supply (% and spatialised)	• Meeting with Khorog planning authority	+

Thematic area		GIS data	"Soft" data, planning documentation	Stakeholder meeting	Community engagement
City Scale	**Water, waste and Sanitation Management**	• Water supply network for region and the city (Length, lines capacity, quality status) - *Dataset should be visualised in polylines* • Sewage network (Length, lines capacity, quality status) - *Dataset should be visualised in polylines* • Energy supply network (Length, lines capacity, quality status) - *Dataset should be visualised in polylines* • Waste management – landfills - *Dataset can be Visualised in plots or points* • Household (Sewage, water and energy average consumption) – *Dataset should be visualised in plots or points (related to each building). If not, it can be shown at a neighbourhood or even district level.*	• Access to % pop (current data) • Infrastructure (spatial/mapped) • Management and Maintenance plan/ strategy/budget • Governance framework for waste, water and sanitation • Vulnerability or quality assessment of existing infrastructure • Financial mechanism for water and sanitation	• Meeting with Khorog planning authority	+
	Social infrastructure and public service	• Social infrastructure (schools, kindergartens, youth centres) – locations with capacities - *Dataset can be visualised in plots or points* • Health infrastructure (healthcare centres, hospitals, etc.) – locations with capacities - *Dataset can be visualised in plots or points* • Education facilities (Education facility category and name) - *Dataset can be visualised in plots or points* • Cultural infrastructure (museums, etc.) – locations with capacities	• Social and cultural structures typology • Financial mechanism for social services (to assess access) • Management and administration of social infrastructure (including in relation to national management e.g. for healthcare – does it follow same guidelines or how much does it diverge according to AKF or local government?) • All social infrastructure including authority and informally managed services	• Meeting with Khorog planning authority	+
	Local Economy/ Markets	• Markets - *Dataset can be visualised in plots or points*		• Meeting with Khorog planning authority	+
	Social and Religious service	• Religious services - *Dataset can be visualised in points*	• Informal religious services and non-dominant religious practices		+
	Mobility patterns, connectivity, walkability				+

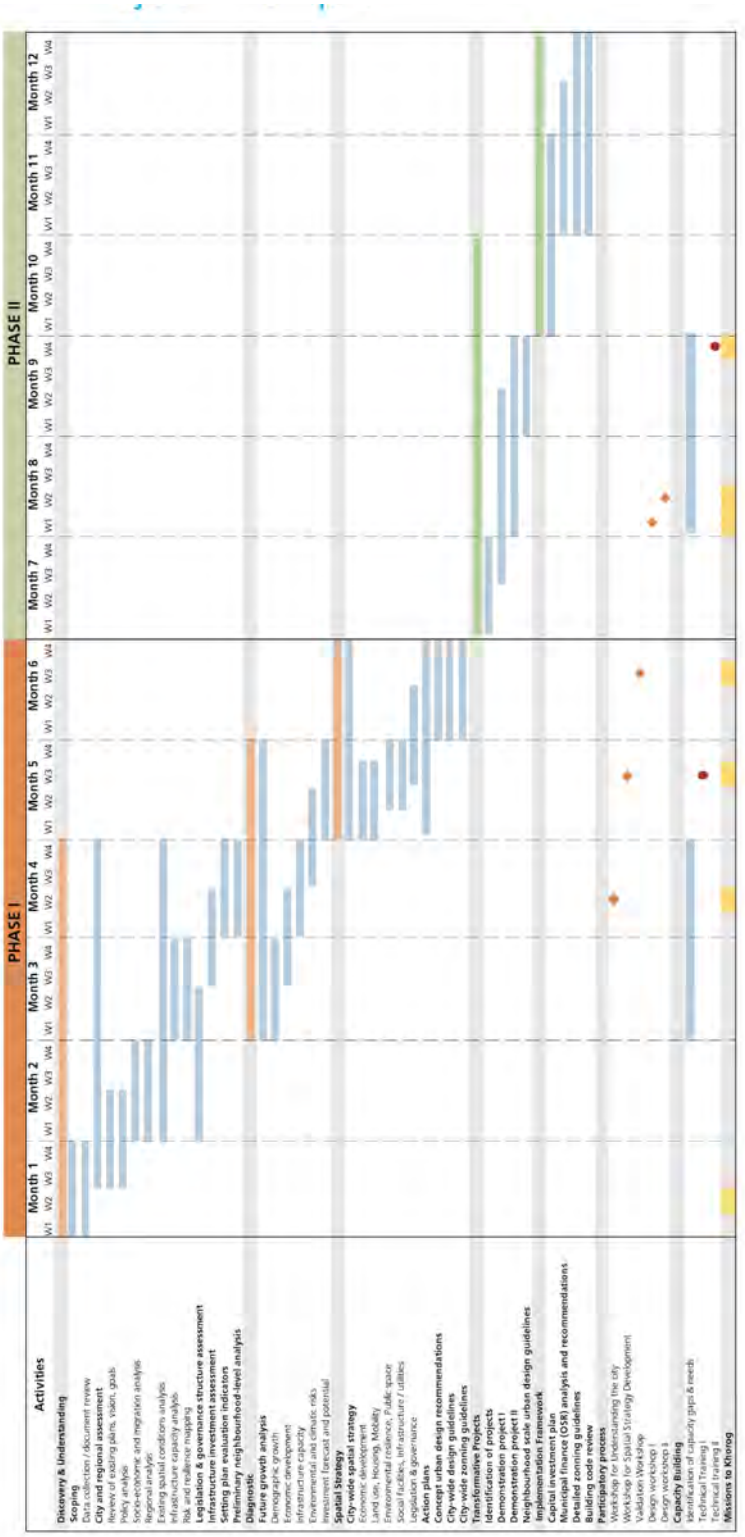
Thematic area		GIS data	"Soft" data, planning documentation	Stakeholder meeting	Community engagement
City Scale	**Housing, land and property (Land ownership analysis**	• Land ownership • Cadastre/plots - *Polygons should match satellite images*	• Household occupancy – by area and household types and land ownership (e.g. multi-family dwellings vs single occupancy, self-owned vs state owned) • Housing typology and plot typology	• Meeting with Khorog planning authority	+
	Urban fabric and urban morphology	• Urban footprint- *Data set should be visualised in polygons* • Urban footprint – change over time – urban growth • Planned and unplanned areas of the city, Formal vs informal structures • Unbuildable areas - *Data set should be visualised in polygons or areas* • topography/watershed - *Data set should be visualised in polygons or areas*	• Existing management or strategy for expansion		+
	Public space patterns	• Public space footprint (privately owned, state owned, un programmed, programmed, green and non-landscaped) - *Data set should be visualised in site plots.*	• Different types of use among the community (women, youth, PwD)		+
	Analysis of current infrastructure	• Current infrastructure projects - *Data set should be visualised in points.*		• Meeting with Khorog planning authority	+
	City Structure and Neighbourhood context	• Land Use category (Residential, Commercial, Mixed, Industrial, Governmental, etc.) – • Data needs to be visualised at the plot scale. Also, it must be the most recent version of the land use. In order to ensure this, the dataset must be compared with the current satellite image. In addition, the calculation requires the average number of square meters required to host a single employee for each land use type. This information will be provided by the local partner • • Buildings (Ownership (private or public), number of storeys, number of rooms, material, building age) - *Dataset should be visualised in plots or points*	• Structural change over time • Socio-economic and demographic data by neighbourhood • Neighbourhood investment data	• Meeting with Khorog planning authority	+

Table 4. Initial data requests

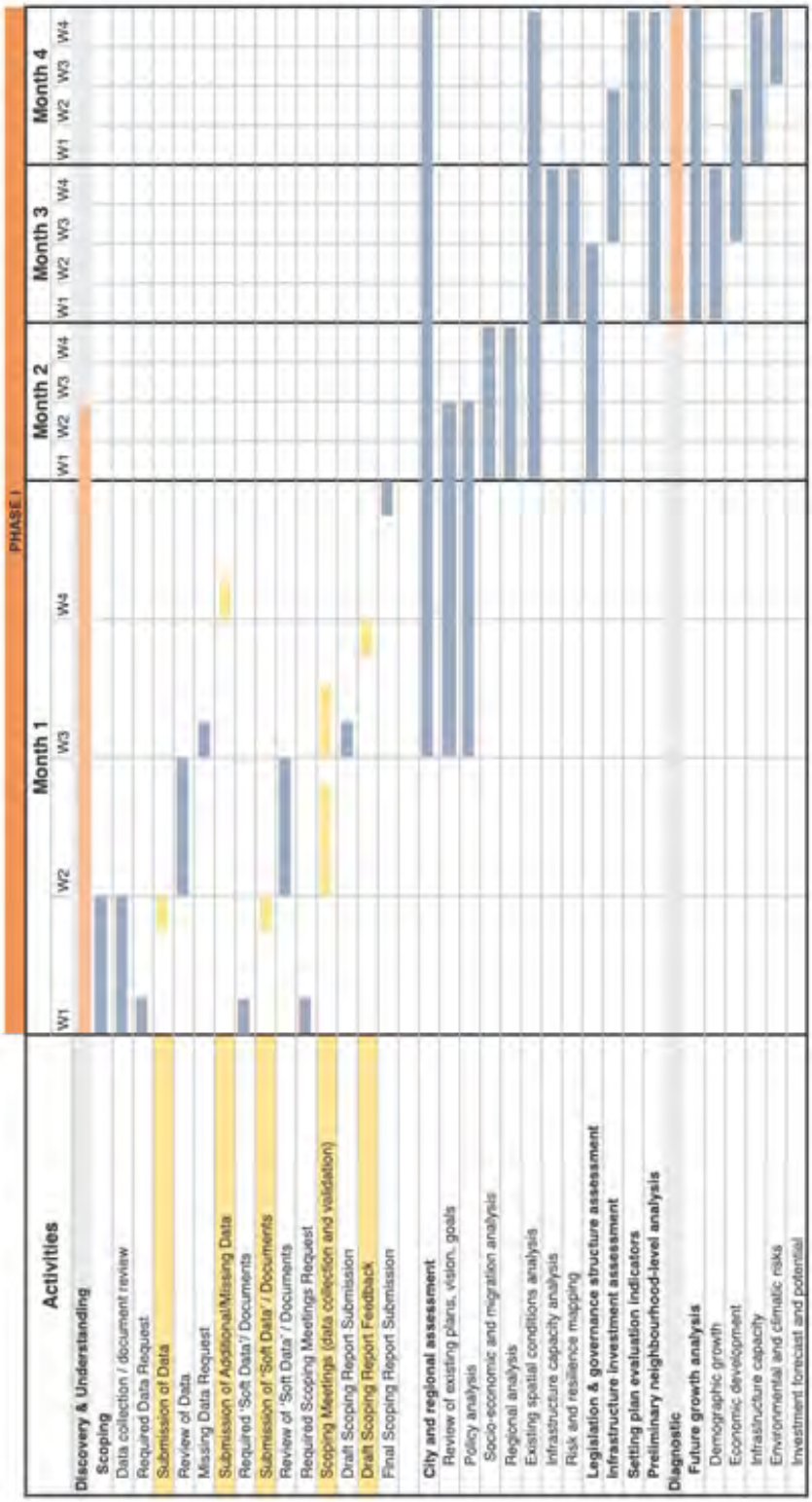
7

ANNEX

7.1. WORK TIMELINE; PROJECT OVERVIEW



7.2. DETAILED WORKPLAN



7.3. MAPPING REFERENCES (PROJECT BOUNDARIES)

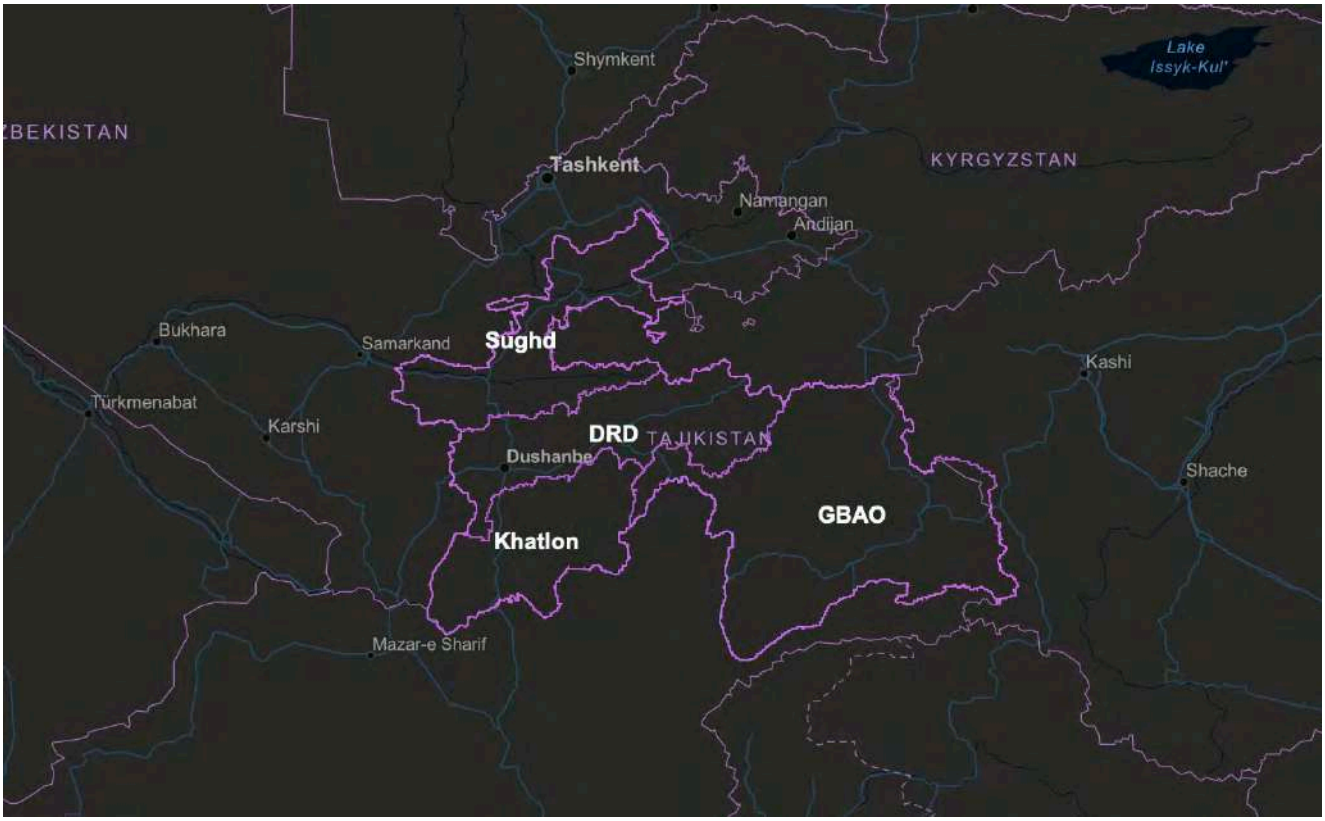


Fig 12. Map A. Tajikistan and Surrounding Area

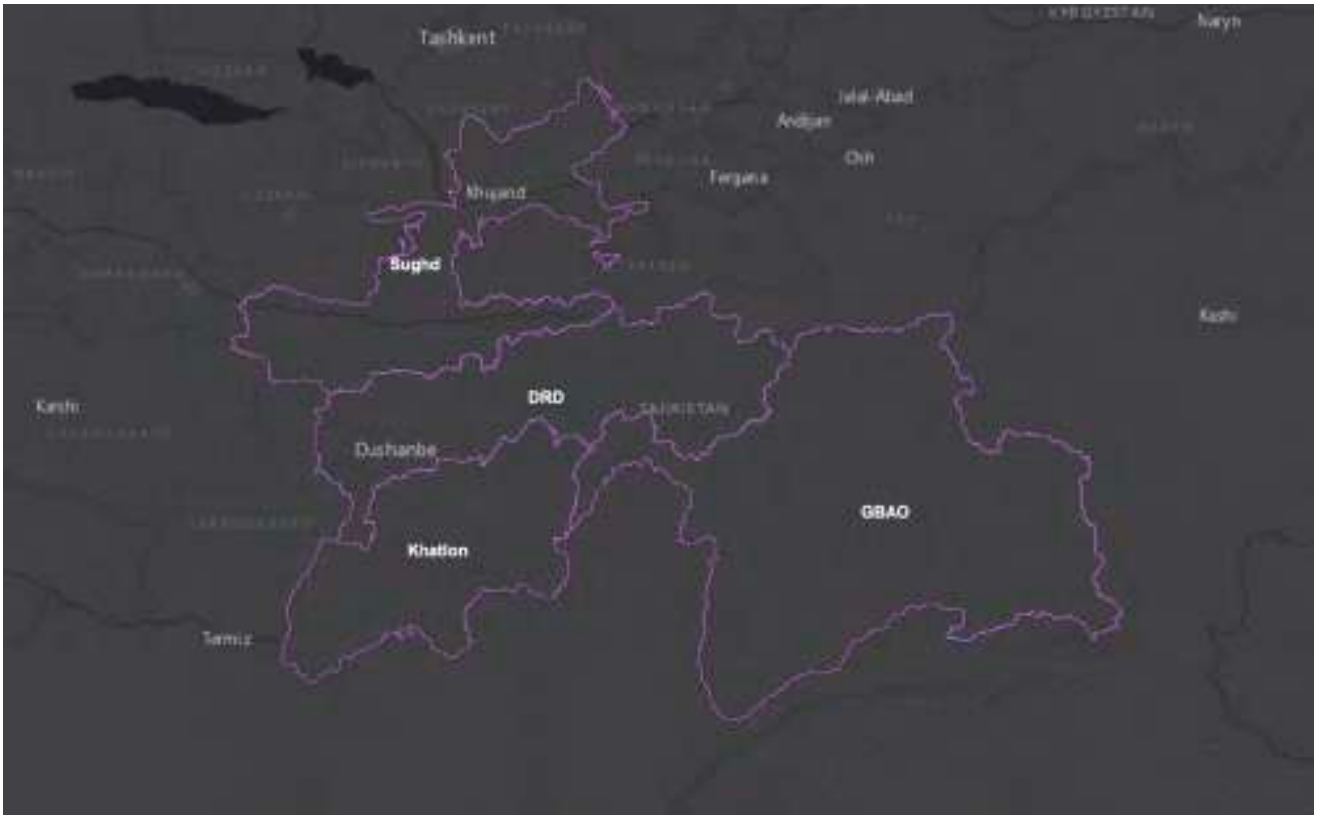


Fig 13. Map B. Tajikistan and Regional Boundaries

Fig 14. Map C. Khorog Location

Fig 15. Map D. Khorog City and Topography

7.4. SOURCES ANALYSED

Color legend:

Scale
Thematic
Useful Source
Relevant Source

Source	Date	Link
National and International Scale		
National Development Agenda		
World Bank Group. 2018. Tajikistan Systematic Country Diagnostic : Making the National Development Strategy 2030 a Success - Building the Foundation for Shared Prosperity. World Bank, Washington, DC.	2018	
Administrative & Governance system		
World Bank Group. 2018. Tajikistan Systematic Country Diagnostic: Making the National Development Strategy 2030 a Success - Building the Foundation for Shared Prosperity. World Bank, Washington, DC.	2018	http://documents.worldbank.org/curated/en/680151528479302248/pdf/TJK-SCD-WEB-v300518-06052018.pdf
Kryukov Konstantin. Deputy Dean of the Law Faculty Ural Institute of Humanities. Features of the local government in the Republic of Tajikistan.		
Mamadsho Ilolov, Mirodasen Khudoiyev. 2020. Local Government in Tajikistan. Developing new rules in the old environment.	2020	https://www.legal-tools.org/doc/6f8ec8/
Migration Context		
World Bank Group. 2018. Tajikistan Systematic Country Diagnostic: Making the National Development Strategy 2030 a Success - Building the Foundation for Shared Prosperity. World Bank, Washington, DC.		
Andrei Do□rre, Stefan Schu□tte.2020. Exchange Relations and Regional Development in Gorno-Badakhshan, Tajikistan. Centre for Development Studies (ZELF) Institute of Geographical Sciences Freie Universita□t,Berlin.	2020	https://www.geo.fu-berlin.de/geog/fachrichtungen/anthrogeog/zelf/Medien/download/BGP-50_GBAO_2_.pdf
Christine Oriol. 2018. Agricultural and Food Systems Transformation for Better Food Security and Nutrition in Eurasia. World bank & the Eurasian centre for food security.	x2018	https://ecfs.msu.ru/images/news/ECFS_Flagship_Country_study_Tajikistan.pdf
PRISE.2017. Migration, remittances and climate resilience in Tajikistan.	2017	https://carececo.org/eng_P2%20WP1%20Migration,%20remittances_FIN.pdf
Climate Change context		
OECD (2016) Financing Climate Action in Tajikistan; Country Study. "International Climate Finance for Eastern Europe, the Caucasus, and Central Asia (EECCA). Germany.	2016	https://www.oecd.org/environment/outreach/Tajikistan_Financing_Climate_Action.Nov2016%20rev%20Feb%202017.pdf
United Nations Development Programme Tajikistan (2014) Guidelines For Region-level Disaster Risk Assessment for Tajikistan Version 4.0.	2014	
United Nations Development Programme Tajikistan (2013) Recovery Framework Small Scale Disasters in Tajikistan Including Winter, Conflict and Gender Rapid Assessment Supplement. REACT Recovery Framework. Disaster Risk Management Program.	2013	[https://untj.org/wp-content/uploads/2019/09/recovery_framework_eng.pdf]
Kelly, C. (2013) Disaster Recovery Guide. DRMP UNDP. Tajikistan.	2013	[http://untj.org/files/Publications/DRMP/resource_page/government_recovery_guide_final_eng.pdf]
United Nations Development Programme (2012) Tajikistan: Poverty in the Context of Climate Change. Dushanbe.	2012	http://hdr.undp.org/sites/default/files/tajikistan_2013.pdf
General		
Statistical Agency under the President of the Republic of Tajikistan (TajStat)	Current	https://www.stat.tj/en/

Facts and Figures about Tajikistan (general)	Current	https://untj.org/?page_id=544
Ministry of Economic Development and Trade of the Republic of Tajikistan (2018) National Report on Implementation of Strategic Documents of the Country in the context of the Sustainable Development Goals, [online]. Available at:	2018	[https://untj.org/wp-content/uploads/2018/11/National-Report-ENG.pdf]
The World Bank Group (2014). Cities in Europe and Central Asia, [online]. Available at:	2014	http://documents1.worldbank.org/curated/en/470931511944745629/pdf/121732-BRI-P154478-PUBLIC-Tajikistan-Snapshot-Print.pdf
Regional/Oblast		
Urban Growth		
UN. (2019). World Population Prospects 2019. Department of Economic and Social Affairs of the United Nations Secretariat. [online]. Available at:	Current	https://population.un.org/wpp/
Samidoza, Kh. (2016) National Report on the development of human settlements of the Republic of Tajikistan for the UN World Conference on Human Settlements HABITAT III, [online]. Available at:	2016	http://habitat3.org/wp-content/uploads/%D0%A5%D0%B0%D0%B1%D0%B8%D1%82%D0%B0%D1%82ENG-V-format_Tajikistan.pdf
United Nations Economic Commission for Europe (2011) Country Profiles on the Housing Sector; Tajikistan. New York and Geneva.	2011	https://www.unece.org/housing-and-land-management/areas-of-work/housingcountryprofiles/country-profile-studies/tajikistan-2011.html
Pavel Parshin, The place and role of Gorno-Badakhshan Autonomous Region in the state system of Tajikistan, Centre for Global Studies, Institute for International Studies, MGIMO University, Moscow		
Location and Connectivity		
Environmental and social management framework (ESMF). 2019. Socio-economic resilience strengthening project, Tajikistan	2019	http://documents1.worldbank.org/curated/en/514111555482259487/pdf/Tajikistan-Socio-Economic-Resilience-Strengthening-Project.pdf
Social and Demographic		
Rival for Authority in Tajikistan's Gorno-Badakhshan". 14 March 2018.Crisis Group Europe and Central Asia Briefing No. 87.	2018	https://d2071andvip0wj.cloudfront.net/b087-rivals-for-authority-in-tajikistan.pdf
Glass Half Full, Poverty Diagnostic of Water Supply, Sanitation, and Hygiene Conditions in Tajikistan.2017. International Bank for Reconstruction and Development / The World Bank. Washington, DC.	2017	https://openknowledge.worldbank.org/bitstream/handle/10986/27830/W17023.pdf?sequence=2&isAllowed=y
ADB. (2018). Asian Development Outlook 2018: How Technology Affects Jobs. Manila: Asian Development Bank.6,7	2018	
ADB. (2016). Tajikistan: Country Gender Assessment. Manila: Asian Development Bank.	2016	
Land use		
Investigations on land cover and land use of Gorno Badakhshan (GBAO) by means of land cover classifications derived from LANDSAT 7 data making use of remote sensing and GIS techniques.2004. Diplomarbeit der Philosophisch-naturwissenschaftlichen Fakultät der Universität Bern	2004	
Ecological Framework		
Babagaliyeva, Z., Kayumov, A., Mahmadullozoda, N., & Mustaeva, N. (2017). Migration, remittances and climate resilience in Tajikistan. PRISE Working paper: Part I.	2017	http://carececo.org/eng_P2%20WP1%20Migration,%20remittances_FIN.pdf
Linking Natural Resource Management and Adaptation to Climate Change. Experiences from the Tajik Pamirs. 2012. GIZ Regional Programme. Sustainable Use of Natural Resources in Central Asia, Bishkek	2012	http://www.naturalresources-centralasia.org/assets/files/Climate_TAJ_low_quality.pdf
Urban and Rural Economy		
Price. R (2018) Economic development in Tajikistan. K4D Helpdesk Report 402. Brighton, UK:Institute of Development Studies.	2018	https://assets.publishing.service.gov.uk/media/5c6c383040f0b647ac8db276/402_Economic_Development_in_Tajikistan.pdf

Asadov, S., & Mogilevskii, R. (2018) Financial Inclusion, Regulation, Financial Literacy, and Financial Education in Tajikistan. ADBI Working Paper 847. Tokyo: Asian Development Bank Institute.	2018	https://www.adb.org/sites/default/files/publication/425991/adbi-wp847.pdf
World Food Programme (2018) Scoping Study on Social Protection and Safety Nets for Enhanced Food Security and Nutrition in Tajikistan.	2018	https://www.wfp.org/publications/Study-Social-Protection-Safety-Nets-Tajikistan
Claussen, J. (2018) Financial Analysis to Support SDGs Implementation in Tajikistan, Report. United Nations, Dushanbe.	2018	https://www.undp.org/content/dam/tajikistan/docs/Poverty%20Reduction/undp_tjk_Financial-analysis-to-support-SDGs-final-updated-Eng.pdf
World Bank Group. (2017) Tajikistan Country Economic Update, Fall 2017: Heightened Vulnerabilities Despite Sustained Growth. Washington, D.C.: World Bank.	2017	https://documents.worldbank.org/en/publication/documents-reports/documentdetail/963071514451761441/country-economic-update-2017
Khujamkulov, I. (2017). The Impact of Institutions and the Shadow Economy on Tax Revenue Collection in Tajikistan. Institute of Public Policy and Administration, Working Paper No.38, 2017. University of Central Asia.	2017	https://www.ucentralasia.org/Content/Downloads/UCA-IPPA-WP38-The%20Impact%20of%20Institutions%20and%20the%20Shadow%20Economy%20on%20Tax%20Revenue%20Collection%20in%20Tajikistan-Eng.pdf
World Food Programme in Tajikistan (2017) Standard Project Report. Country Programme - Tajikistan (2016-2020). Tajikistan.	2017	https://www.wfp.org/operations/200813-tajikistan-country-programme-2016-2020
Grigorian, D.A., & Kryshko, M. (2017). Deposit Insurance, Remittances, and Dollarisation: Survey-Based Evidence from a Top Remittance-Receiving Country. IMF Working Paper No. 17/132. Asia and Pacific Department. Washington, D.C.: IMF.	2017	https://www.imf.org/en/Publications/WP/Issues/2017/06/08/Deposit-Insurance-Remittances-and-Dollarization-Survey-Based-Evidence-from-a-Top-Remittance-44918
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Linking Natural Resource Management and Adaptation to Climate Change. Experiences from the Tajik Pamirs. 2012. GIZ Regional Programme. Sustainable Use of Natural Resources in Central Asia, Bishkek	2012	
Future Planned Infrastructure Bishkek		
See transport in city section*		
OECD Library - Sustainable Infrastructure for Low-Carbon Development in Central Asia and the Caucasus: Hotspot Analysis and Needs Assessment	Data from 2015-2019	http://citilink.ru
Development Potential		
Integrating climate change adaptation and water management in the design and construction of roads, Worldbank, META		https://roadsforwater.org/wp-content/uploads/2018/04/Tajikistan-report-WB-assessment.pdf
United Nations in Tajikistan (2016 - 2020) United Nations Development Assistance Framework (UNDAF) for Tajikistan, [online]. Available at:	2016	[https://untj.org/files/Publications/UNDAF_2016-2020_eng_final_web.pdf]
United Nations Economic Commission for Europe (2015). Innovation Performance Review of Tajikistan. Geneva, Switzerland: United Nations Economic Commission for Europe.	2015	https://www.unece.org/index.php?id=41877
Projects		
European Bank for Reconstruction and Development (2020) Tajikistan Country Strategy 2020-2025, [online]. Available at:	2020	file:///Users/maiasmillie/Downloads/tajikistan-country-strategy-1.pdf

World Bank Group (2015) Tajikistan - Social Safety Net Strengthening Project : restructuring. Washington, D.C.	2015	http://documents.worldbank.org/curated/en/819631506585235911/Tajikistan-Social-Safety-Net-Strengthening-Project-restructuring
City Context		
Legislation and Gov structure assessment		
See the Administrative & Governance system thematic area at the national scale		
B. Aminjonov. Jamoat as Anstitution of Local Self-Government in the Republic of Tajikistan.		
Previous/Current planning frameworks and unification of goals		
Aga Kahn Historic Cities Programme; Strategies for Urban Regeneration, [online]. Available at:		https://s3.amazonaws.com/media.archnet.org/system/publications/contents/6722/original/DPC3577.pdf?1384801262
University of Central Asia (2019) Annual Report, [online]. Available at: https://www.akdn.org/publication/2019-annual-report	2019	https://www.akdn.org/publication/2019-annual-report
Social and Demographic context and migration		
Molesworth, K, Sécula, F., Eager, R. A., Murodova, Z., Yarbaeva, S., & Matthys B. (2017). 'Impact of group formation on women's empowerment and economic resilience in rural Tajikistan'. The Journal of Rural and Community Development, 12(1), 1-22.	2017	
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Muller, K. (2010) SIL Electronic Survey Report; Language in Community-Oriented and Contact-Oriented Domains: The Case of the Shughni of Tajikistan	2010	https://eurasia.sil.org/ru/resources/archives/9232
Kanji, N. (2002) Trading and Trade-Offs: Women's Livelihoods in Gorno-Badakhshan, Tajikistan. Development in Practice. Vol. 12, No. 2, pp. 138-152	2002	
Climate change risk mapping		
United Nations Development Programme .2012. National Human Development Report. Tajikistan: Poverty in the Context of Climate Change. Dushanbe	2012	
Transport		
Dörre, A (2020) Exchange Relations and Regional Development in Gorno-Badakhshan, Tajikistan	2020	https://www.researchgate.net/publication/341072775_Exchange_Relations_and_Regional_Development_in_Gorno-Badakhshan_Tajikistan_Berlin_Geographical_Papers_50_edited_issue
Aminjonov, F. et al. (2019) BRI in Central Asia: Rail and Road Connectivity Projects. Central Asia Regional Data Review 21. 1–18.	2019	http://www.osce-academy.net/upload/file/CADGAT_21_BRI_Road_and_Rail.pdf
Asia Development Bank (2011) Developing Tajikistan's Transport Sector; Transport Sector Master Plan. Transport and Communications. Tajikistan.	2011	https://www.adb.org/sites/default/files/publication/28979/transport-taj.pdf
Water and sanitation/waste		
European Union (2019) Action Document for"Sebzor hydropower plant construction project", [online]. Available at:	2019	https://ec.europa.eu/international-partnerships/system/files/measure-financing-tajikistan-sebzor-annex-c-2019-5046_en.pdf
The World Bank Group (2017) Poverty Diagnostic of the Drinking Water, Sanitation and Hygiene Sector in Tajikistan. Washington, D.C	2017	https://documents.worldbank.org/en/publication/documents-reports/documentdetail/622731504073608228/main-report

The World Bank Group (2014) Assessment of household energy deprivation in Tajikistan : policy options for socially responsible reform in the energy sector. Washington, D.C	2014	https://documents.worldbank.org/en/publication/documents-reports/documentdetail/944321468341064427/assessment-of-household-energy-deprivation-in-tajikistan-policy-options-for-socially-responsible-reform-in-the-energy-sector;
Basic Urban Services		
See the source on the regional scale		
DHInfrastructure. Tajikistan Geospatial Electrification Analysis.		https://dhinfrastructure.com/project?pid=3015
Social infrastructure/public services		
University of central Asia (2020) Building a University Town in Khorog, [online]. Available at:	2020	https://www.akdn.org/publication/building-university-town-khorog
European Commission (2020) Youth Empowerment toward Sustainability and Change. Instrument Contributing to Stability and Peace (icsp), [online]. Available at:	2020	Report: [https://www.icspmap.eu/pdf/?format=]
Aga Kahn Development Network (2020) AKAH and partners launch key infrastructure projects in Tajikistan, [online]. Available at:	2020	https://s3.eu-west-2.amazonaws.com/akdn.org-files/s3fs-public/2020_0512_akah_-_construction_of_key_infrastructure_in_tajikistan_eng_0.pdf
D. Miskinzod (2020) Maternal Mortality in Tajikistan: Successes and Challenges. Int J Womens Health Wellness.	2020	https://clinmedjournals.org/articles/ijwhw/international-journal-of-womens-health-and-wellness-ijwhw-6-111.php?jid=ijwhw
Ahmed, T. Et al. (2019) Incentivising Quantity and Quality of Care: Evidence from an Impact Evaluation of Performance-Based Financing in the Health Sector in Tajikistan. Development Economics Development Research Group & Health, Nutrition and Population Global Practice. Policy Research Working Paper 8951.	2019	https://documents.worldbank.org/en/publication/documents-reports/documentdetail/612501564495857201/incentivizing-quantity-and-quality-of-care-evidence-from-an-impact-evaluation-of-performance-based-financing-in-the-health-sector-in-tajikistan
University of Central Asia (2018) Birth of a Development University, [online]. Available at:	2018	https://s3.eu-west-2.amazonaws.com/akdn.org-files/s3fs-public/media/publications/2018_0914_uca_-_birth_of_a_development_university_khorog_-_eng-rus.pdf
Aga Kahn Development Network (2016) Transforming Health Care, [online]. Available at:	2016	https://www.akdn.org/publication/transforming-health-care
World Health Organisation, Regional Office for Europe (2015) Situational Analysis; State of Rehabilitation in Tajikistan. Denmark. World Health Organisation, Regional Office for Europe (2019) Assistive Technology in Tajikistan. Denmark.	2015 & 2019	https://www.euro.who.int/__data/assets/pdf_file/0009/276480/State-Rehabilitation-Tajikistan-Report-en.pdf https://apps.who.int/iris/bitstream/handle/10665/312313/9789289054102-eng.pdf?sequence=3
Aga Kahn Development Network (2014) Enabling Development and Transforming Lives; A review of Pamir Energy's cross-border energy programme in Bashor, Afghan Badakhshan, [online]. Available at:	2014	https://www.akdn.org/publication/akdn-enabling-development-and-transforming-lives-review-pamir-energys-cross-border
Local Economic activity		
Ryazantsev. S et al. (2019) Cross-border trade and migration in the context of Tajikistan's international economic cooperation with neighbouring countries. Advances in Social Science, Education and Humanities Research, volume 374 .	2019	file:///Users/maiasmillie/Downloads/125925300-1.pdf
Social and religious services		
Aga Kahn Development Network, the Ismaili Centre, [online]. Available at:	Current	https://the.ismaili/news/jamatkhana-and-khorog-opens-its-doors-jamat
Mobility		
See the components on transport and connectivity		

Housing Land Property		
Rangina Nazrieva. 2016. Real estate registration project social assessment report. Dushanbe	2016	
An Analysis of Existing Legislation and Land Reform Policy in the Context of Protection of Equal Rights to Land Tenure. International public organisation 'Rights and Prosperity' with UNIFEM support and in cooperation with the Agency of Land Tenure, Geodesy and Cartography and the Committee for Women's Affairs. 2008, Duahnbe	2008	
Urban fabric and morphology		
Levi-Sanchez, S. (2017) The Afghan-Central Asia Borderland: The State and Local Leaders. Routledge.	2017	https://www.taylorfrancis.com/books/9781315691718
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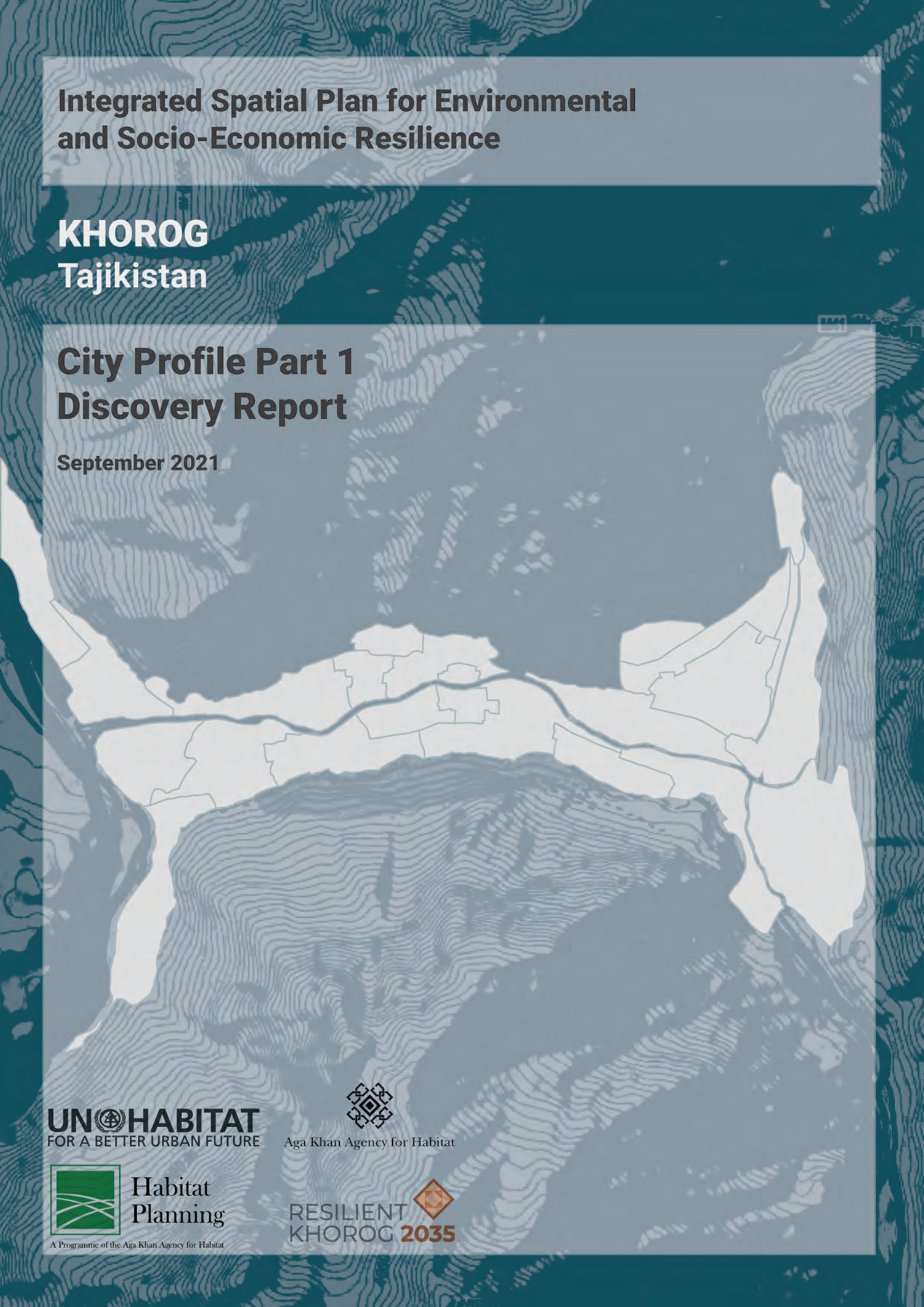
Integrated Spatial Plan for Environmental and Socio-Economic Resilience

KHOROG
Tajikistan

City Profile Part 1
Discovery Report

September 2021



UN HABITAT
FOR A BETTER URBAN FUTURE

Aga Khan Agency for Habitat

Habitat Planning
A Programme of the Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience
Khorog, Tajikistan

City Profile Part 1: Discovery Report

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UN-HABITAT FOR A BETTER URBAN FUTURE
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Integrated Spatial Plan for Environmental
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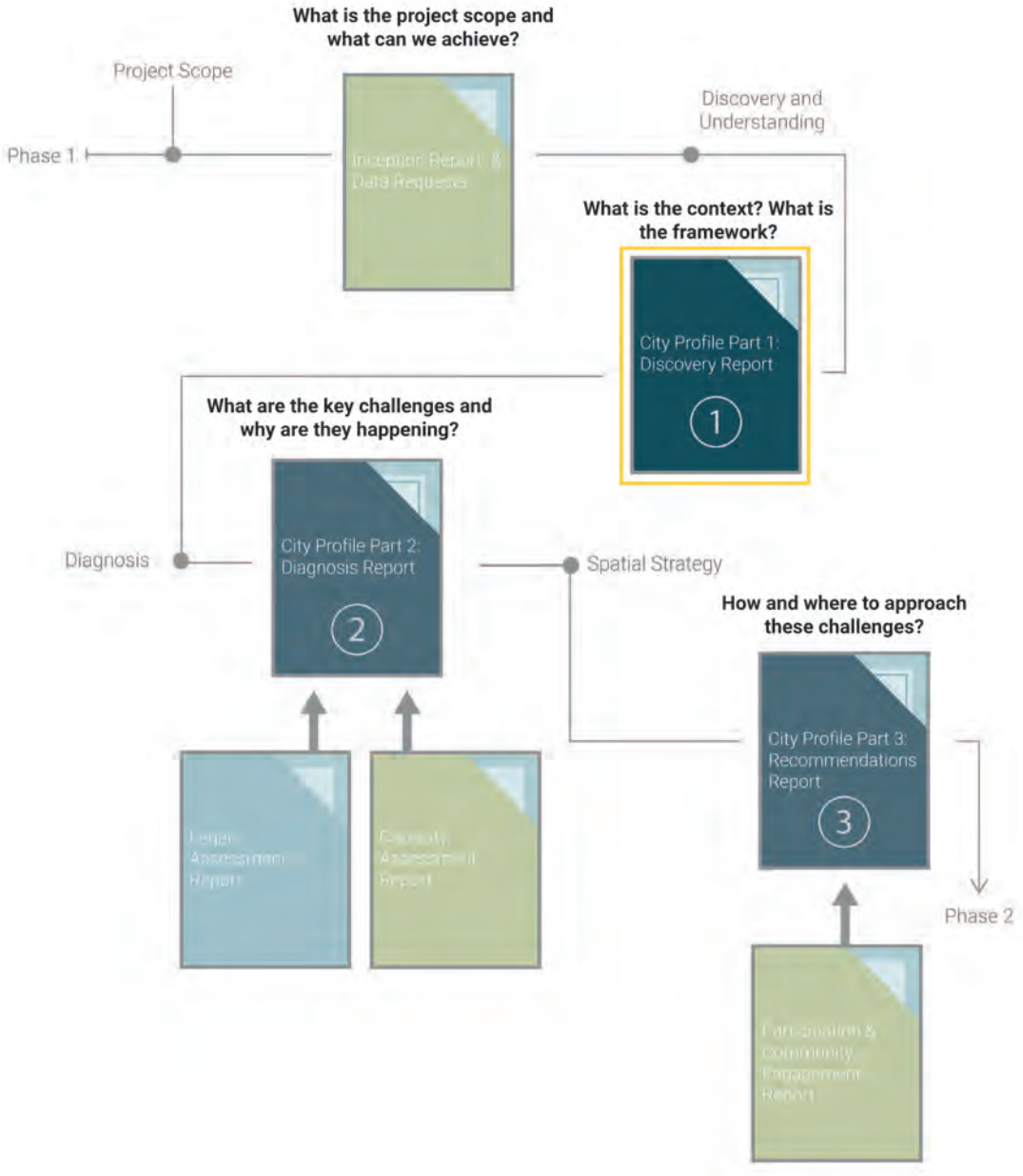
City Profile Part 1
Discovery Report



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1

INTRODUCTION

1.1. INTEGRATED SPATIAL PLAN FOR ENVIRONMENTAL AND SOCIO-ECONOMIC RESILIENCE

UN-Habitat has partnered with the Aga Khan Agency for Habitat and the government of Tajikistan, through the Aga Khan Development Network, for the 'Integrated Spatial Plan for Environmental and Socio-Economic Resilience' in Khorog Tajikistan. UN-Habitat's Urban Lab, in a collaborative process with other units and branches within the Planning Finance and Economy Section and the Urban Practices Branch, aims to provide planning direction that can improve resilience and social stability for existing communities and sustainably accommodate the growing population in Khorog through:

- developing strategies, masterplans, interventions, and regulations.
- knowledge creation, capacity building, and guidelines.

More specifically, the project aims to provide environmental, legal, economic, spatial and infrastructure policies and projections, governance and management frameworks, with recommendations for transformative projects, and technical capacity building for stakeholders in planning. UN-Habitat provides planning expertise to guide the growth of Khorog, drawing on existing methodologies, toolkits and best practices in a collaborative and integrated way.

This project is one of several outcomes from an assessment of resiliency that was undertaken for Khorog in 2017 and 2018 by the Swiss State Secretariat for Economic Affairs (SECO) and Holinger, with partnerships from the international community that include the European Union for resilient infrastructure, the Government of Japan, the IFC and World Bank.

The work of UN-Habitat in collaboration with AKAH is part of The Khorog Urban Resilience Planning and Proof of Concept Initiative, supported by SECO to drive resilient infrastructure investment and access to basic public services, intended to reduce risk, ensure more reliable infrastructure and a safer environment. This will, in turn, improve economic growth and wellbeing. This project has been undertaken in parallel with other initiatives for Khorog, such as the EBRD and SECO funded phase 1 and 2 water infrastructure projects.

AKAH looks to UN-Habitat to support the Revised Town Planning process in a way that can ensure alignment of the town plan to UNDRR resilience principles and best practices. The integrated plan for environmental and socio-economic resilience in Khorog will integrate the disaster risk reduction approaches within the planning processes of identified projects.[01]

The project will promote Khorog as a model example of a resilient city in the country and localize the national commitment to the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction, the Paris Agreement on Climate, and the Dushanbe Declaration for the International Decade on Water Action.

1.2. APPROACH & METHODOLOGY

1.2.1. Structure of the City Profile

Phase 1 of the 'Integrated Spatial Plan for Environmental and Socio-Economic' includes three main actions: Discovery and Understanding, Diagnosis and Community Engagement, and Spatial Strategy. The City Profile Part 1, Discovery and Understanding, has been developed in a collaborative process of data collection and desktop research with AKAH and provides a basis of understanding from which Part 2: Diagnosis and Community Engagement and Part 3: Spatial Strategies, can be developed. The structure has been designed to ensure that resilience is considered the fundamental driver of assessment and, as such, is carried forward as a framework for diagnosis that takes existing frameworks and their definition of urban resilience into account in its deployment. The following resilience categories are assessed in this report:

- Institutional resilience: defined as the "Software" or enablers of resilience. This includes processes and structures that allow all actors to participate in the decision-making process and influence strategies for improved urban planning, management and development. This aspect focuses on the relationship between cities and governments and requires adequate and efficient laws, policies, and administrative, operational frameworks.
- Socio-economic resilience: mechanisms and activities that allow countries, regions and cities to become drivers of socioeconomic development by creating jobs, increasing household income, generating investments, reducing social tensions and crime, increasing equality and inclusion, creating opportunities for social cohesion, and enhancing security and safety.
- Spatial and environmental resilience: defined as the "hardware" of resilience. This includes all aspects related to planning and design of the urban space, the quality of the natural environment, public/green spaces, and provisions to combat climate change and its related hazards or risks.
- Resilient Infrastructure and basic services: an extension of the "hardware" of resilience. This includes ensuring equal access to basic services and infrastructures in times of natural or other disasters and promoting disaster-proof structures to meet vital needs of urban populations. Such infrastructures include streets and roads, bridges, drainage, water and electricity supply, sanitation and solid waste management, hospitals, schools, and telecommunications.

Furthermore, within this structure, 'question boxes' at the end of each chapter of the report identify areas of further study required. This report has provided a basis from which to build a stronger diagnosis and assessment of the city in later phases.

1.2.2. Existing frameworks

To develop the City Profile, established thematic and practical frameworks from UN-Habitat were referenced and utilized to guide the design of an urban planning processes, define urban resilience, provide diagnostic tools, and propose mechanisms to build and maintain urban resilience and disaster risk reduction. These frameworks vary in content and structure, demonstrated in the following examples:

Habitat Planning Framework

The core framework to be incorporated into the project process is the **Habitat Planning** Framework developed by AKAH, in conjunction with the Resilience Framework for Action. AKAH is an umbrella agency for legacy organisations including the Aga Khan Planning & Building Services, Focus Humanitarian Assistance, the Disaster Risk Management Initiative, the Portfolio Management Office (PMO), and the Prince Sadruddin Aga Khan Fund for the Environment (PSAKFE) as well as the habitat-related activities of the Aga Khan Rural Support Programme (AKRSP) and the Mountain Societies Development Support Program (MSDSP). AKAH is part of the wider Aga Khan Development Agency. It's mission statement is:

"To address the increasing threat posed by natural disasters and climate change, the Aga Khan Agency for Habitat (AKAH) works to ensure that poor people live in physical settings that are as safe as possible from the effects of natural disasters; that residents who do live in high-risk areas are able to cope with disasters in terms of preparedness and response; and that these settings provide access to social and financial services that lead to greater opportunity and a better quality of life."

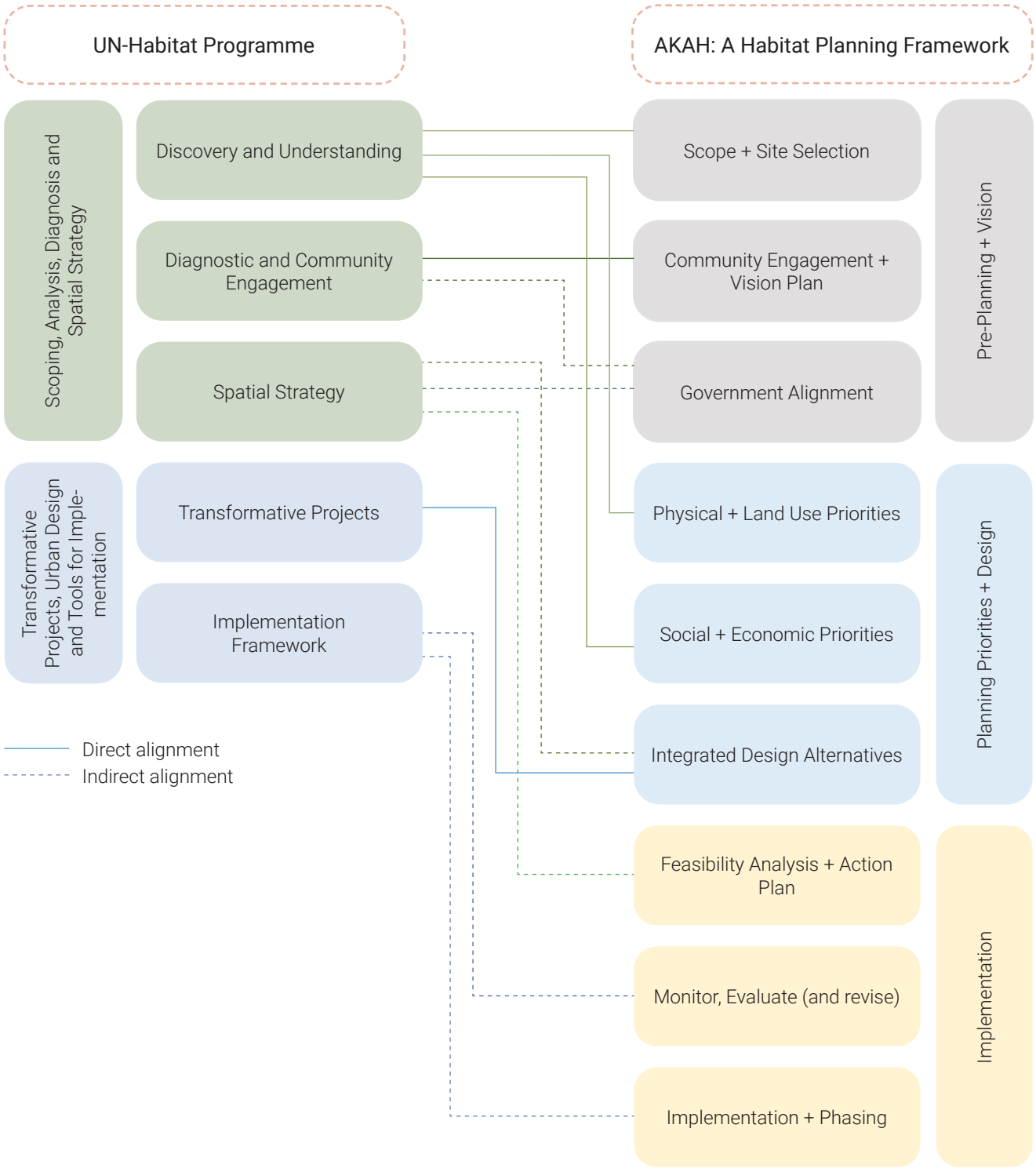


Fig 2. Alignment of UN-Habitat and AKAH's Habitat Planning Framework (using K. Intrator. Overview of Proposed Habitat Planning Process for AKAH, Version 2.0 August 2021)

The Aga Khan Agency for Habitat (AKAH) was created to address the increasing threat of natural hazards due to the effects of climate change, coupled with rapid manmade changes and insecurities have severe impacts on mountain and urban communities. AKAH created the Habitat Planning Framework in 2018 - an eight step process for assisting state or institutionally implemented mountain and rural urban planning projects through participation, data-driven decision making, design and implementation.

AKAH's eight-step process aims to assist urban planning projects in achieving the balance between the strategic planning and community action planning approaches outlined above. It also aims to set an example of enhancing the capacity of local institutions in both participatory and data-driven decision-making processes. When establishing the process AKAH reviewed the Village Development Plans (VDP) and Village Disaster Mitigation Plan (VDMP) methods used in the core target countries: Afghanistan, Tajikistan, and Pakistan. Existing spatial and nonspatial data in Afghanistan, Tajikistan and Pakistan were also analysed to understand how the process could build capacity for incorporating data collection and data-driven decision making into the method.

Pluralistic planning mechanisms and processes are required to reduce vulnerability and create a needs based planning system that will increase quality of life. This is addressed by both the Habitat Assessment and stage 5 - Integrated design alternatives.

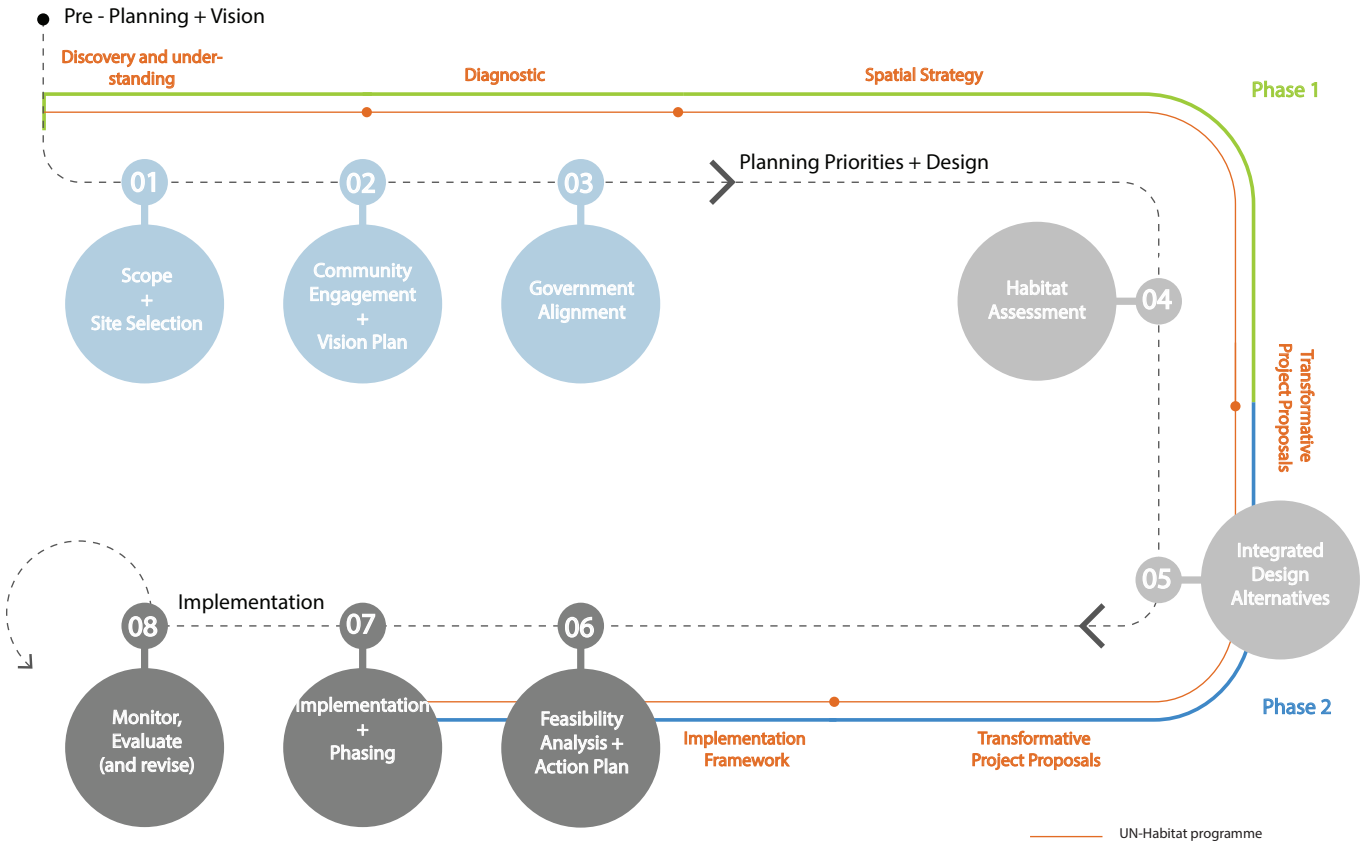


Fig 3. Planning framework (diagram built upon K. Intrator. Overview of Proposed Habitat Planning Process for AKAH, Version 2.0 August 2021)

In addition, Figure 4 shows part of the Habitat Assessment process, including the use of data collection in the capacity building and decision making processes that will be incorporated in Phase 2 of the Project. The engagement of data driven decision making with the community's input addresses the long term local planning goals that are co-defined between the community and local authorities and can therefore be aligned and incorporated into wider urban plans. The process of using data in such a decision-making process also enhances community and institutional capacity to use data to support monitoring, evaluation, and future initiatives.

UN-Habitat's project outputs are heavily based on the knowledge and data collected by AKAH's planning team, contributing to the phases and steps of the AKAH's Habitat Planning Framework to ensure a unified, comprehensive strategic vision among all stakeholders. Figure 2 outlines the key elements of the Habitat Planning Framework, alongside the 'Integrated Spatial Plan for Environmental and Socio-Economic Resilience', to highlight the integration of approaches. Using an evaluation of both approaches, UN-Habitat's progress will be monitored against this framework to ensure alignment throughout the project timeline.

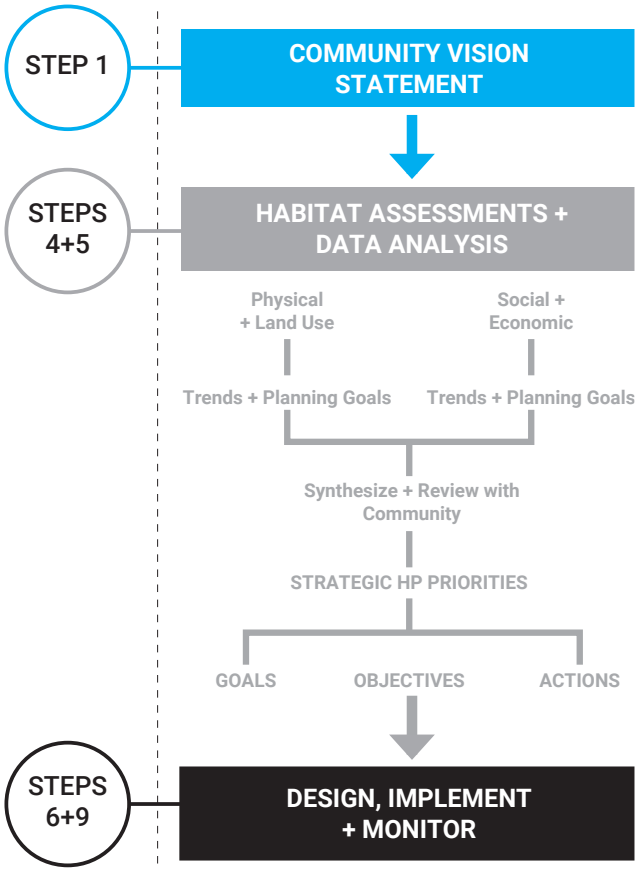


Fig 4. Strategy for developing Habitat Planning Priorities

Fig 5. View on The Ismaili Center, May 2021

Participatory Incremental Urban Planning Toolbox

The Participatory Incremental Urban Planning (PIUP) Toolbox, developed by UN-Habitat, is a step-by-step methodology to assess, design, operationalize, and implement urban planning processes. The toolbox provides flexibility to adapt the methodology to various contexts, based on different necessities and focus areas. By structuring a timeline of phases, blocks and activities, the toolbox helps urban stakeholders to better understand urban planning processes. It ensures stakeholders are engaged in a meaningful way, safeguarding the ownership of completed projects and potential for ongoing, multi-stakeholder collaboration.

The toolbox consists of four phases, 15 blocks, and 69 activities, as illustrated below. Each block focuses on a specific topic and is further broken down into activities to enhance the adoption of participatory, inclusive and sustainable practices. The activities are supported by innovative tools and complementary materials produced by UN-Habitat.

1.2.3. Applied Tools

As well as the planning framework and PIUP, additional tools will be engaged to align the project to best practices, processes and guidelines. These can also be found in the annex and include the following:

- City Resilience Profiling Tool
- City Resilience Action Planning (CityRAP)
- Making Cities Resilient and the "Ten Essentials for Making Cities Resilient"
- Disaster Resilience Scorecard for Cities
- UNDAF

1.3. ALIGNMENT WITH GLOBAL FRAMEWORKS

While all measures proposed within the programme are targeted for implementation at city level, it is envisioned that such priorities could be replicated to address similar challenges in other cities, and further scaled to regional and national levels. As such, the project is further strategically aligned to various international frameworks, while localizing actions and recommendations.

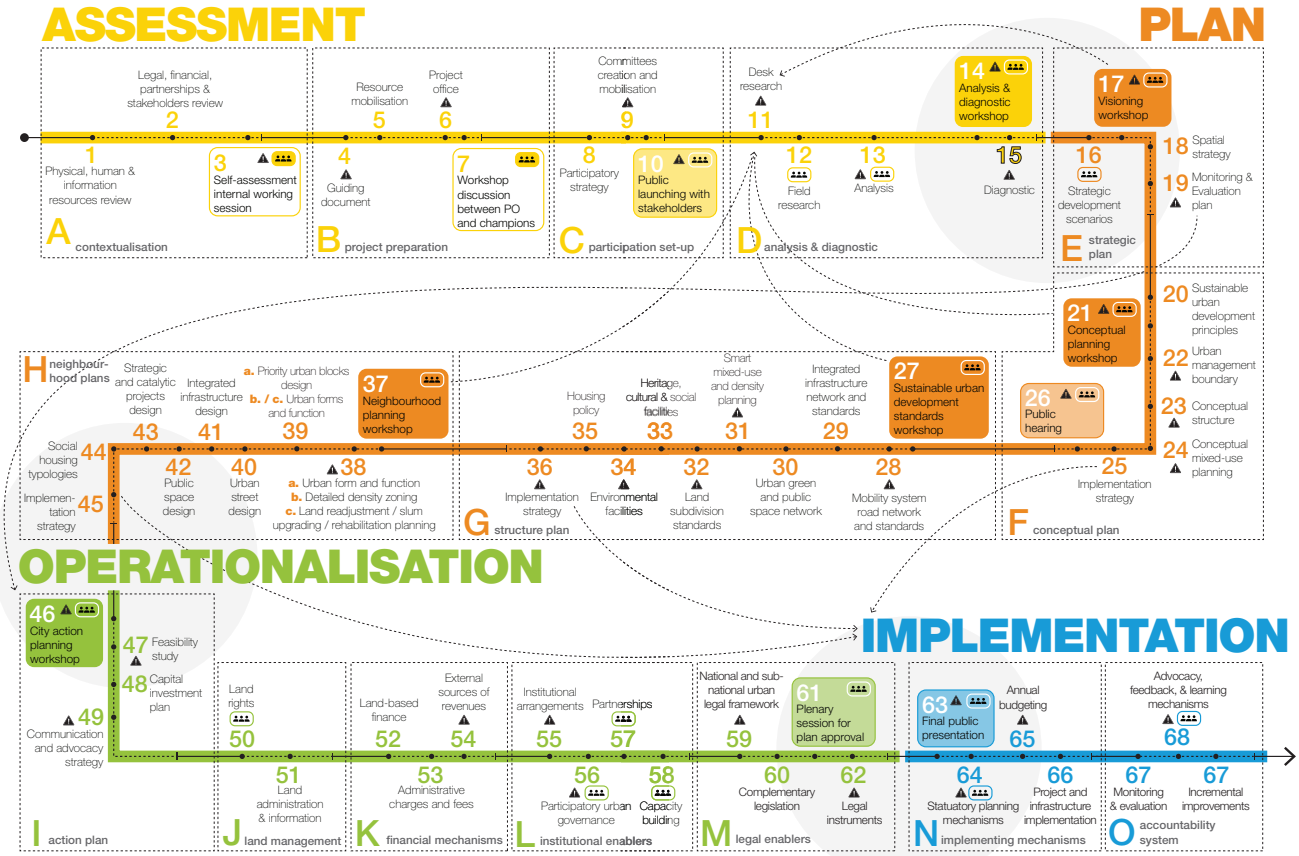


Fig 6. PIUP's phases, blocks and activities

1.3.1. Sustainable Development Goals

Through transformative strategies, the Khorog programme directly supports the realization of SDG 11 on sustainable cities and communities, with particular reference to the following targets:

- 11.1: provide access for all to adequate, safe and affordable housing and basic services.
- 11.2: provide access to safe, affordable, accessible, and sustainable transport systems; improving road safety, notably by expanding public transport.
- 11.3: enhance capacity for participatory, integrated and sustainable human settlement planning and management.
- 11.4: strengthen efforts to protect and safeguard the world's cultural and natural heritage.
- 11.7: provide universal access to safe, inclusive and accessible, green and public spaces.
- 11.A: support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
- 11.B: increase number of cities adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement holistic disaster risk management at all levels.

In addition, the program also supports SDG 9 on resilient infrastructure, industry and innovation, SDG 12 on sustainable consumption and production, SDG 13 on climate action and SDG 17 on partnerships, most notably with reference to the following targets:

- 9.1: develop quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being, with a focus on affordable and equitable access for all.
- 12.8: ensure that people everywhere have the relevant information and awareness of sustainable development and lifestyles that can exist in harmony with nature.
- 13.1: strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
- 13.2: integrate climate change measures into national policies, strategies and planning.
- 17.16: enhance global partnerships for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, in order to support the achievement of the sustainable development goals in all countries, and in developing countries in particular.
- 17.17: encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies that these can bring.

1.3.2. NUA

Tajikistan is a signatory of the New Urban Agenda, with specific commitments that are manifested in the recent adoption of the National Development Strategy until 2030, which tackles new and traditional challenges that the country is faced with. Tajikistan has built on these commitments through the adoption of the 2030 Agenda for Sustainable Development, the SDGs, the Addis Ababa Action Agenda of the Third International Conference on Financing for Development, the Paris Climate Agreement and the Sendai Framework for Disaster Risk Reduction 2015-2030.

This specific programme in Khorog aligns with the Habitat III New Urban Agenda in meeting "the challenges and opportunities of present and future sustained, inclusive and sustainable economic growth". It also aims to provide the strategic spatial framework to "adopt and implement disaster risk reduction and management, reduce vulnerability, build resilience and responsiveness to natural and human-made hazards, and foster mitigation of and adaptation to climate change".

1.3.3. Sendai Framework

The Sendai Framework for Disaster Risk Reduction 2015-2030 outlines seven clear targets and four priority actions to prevent new disasters and reduce risk posed by those that are existing. The Khorog program is well aligned to the four priority areas and their key actions. It addresses priority 1; understanding disaster risk by promoting collection, analysis, management and use of relevant data to assess disaster risks, vulnerability, exposure, hazard and their possible sequential effects through the use of technological innovation and collaboration. The program analysis of the current governance structure addresses priority 2; strengthening disaster risk governance. The program's focus on financing and capital investment planning will ensure that prioritized measures are cost-effective and instrumental to save lives, prevent and reduce loss, and ensure effective recovery and rehabilitation. The latter point is further aligned to priority 3; investing in disaster risk reduction for resilience. Finally, through the development of building codes and demonstration projects, priority area 4 is addressed; for effective response and building back better in times of recovery, rehabilitation and reconstruction.

1.3.4. Paris Agreement on Climate Change

The program's focus on resilience aligns to the Paris Agreement on Climate Change by way of increasing Khorog's resilience in an ability to adapt to the adverse impacts of climate change. Within the Khorog context, this relates directly to the adverse impacts of flooding, droughts, avalanches and landslides. Such disasters have become more frequent in the area, with growing impact.

1.3.5. Paris Dushanbe Declaration for the International Decade on Water Action

The Declaration of The Decade for Action on "Water for Sustainable Development, 2018-2028", was launched in an event in Dushanbe in 2018. This event and resultant declaration highlighted the importance of water access and management for the achievement of sustainable development. This challenge is of particular importance to Tajikistan, as it will affect the country's ability to create resilience in the face of natural hazards, climate change and political vulnerabilities associated with resource ownership and management. The Declaration for the International Decade on Water Action is aligned with the focus on resilience in Khorog in such a way as to facilitate the realization of Sustainable Development Goal 6; to "ensure availability and sustainable management of water and sanitation for all".

Fig 7. Residential development along the river in Khorog, May 2021

Fig 8. Street in the central area of Khorog, May 2021

1.4. HISTORICAL CONTEXT

The territory of present-day Tajikistan has been a crossroads for various tribes and ethnic groups that had control over Central Asia over the past 3000 years. From 500 BC until the Arab invasion in the 7th century, Central Asia was under Persian rule. While Central Asia was invaded successively by the Arabs during the Umayyad and Abassid dynasties, the Persian influence remained strong in the region. The region was also influenced by the Chinese expansion, and the combination of both influences led to a flowering of Islamic thought and philosophy.

Until the mid-18th century, Tajikistan was part of the emirate of Bukhara. Russian conquests in Central Asia controlled parts of Tajikistan, notably the Zeravshan and Fergana valleys, while the emirate of Bukhara became a Russian protectorate in 1868.

After the Russian Revolution that took place in 1917, the Turkestan A.S.S.R was established in April 1918 and included a large portion of Tajikistan. Tajikistan was later the scene of the Basmachi revolt in 1922-1923, a strong resistance movement organized by indigenous, Muslim tribes against the Russian Imperial and Soviet rule. The Central Asian political borders were changed in 1924. The Tajik A.S.S.R was created as an autonomous republic as part of this change, due to ethnic principles. The Soviet state also faced opposition from Britain, and that same year, the Soviet Union formally created the Gorno Badakhshan Autonomous Region (GBAO), mindful of its strategic importance near the borders with China and Afghanistan. Khorog was officially named the capital of the GBAO in 1925 and grew with Soviet Union efforts to attract migrants to the area.

In 1929 the status of the Tajik A.S.S.R. was raised to that of a Soviet Socialist Republic (S.S.R), marking the first recognition of a Tajik state. Soviet Union membership led to social and economic transformation in the country through infrastructural investment. Dams were constructed for electric power generation and irrigation and Dushanbe was transformed into a modern capital city. A number of structural changes led to greater connectivity, affecting the accessibility in Gorno Badakhshan in particular, with the construction of the first highway and flight route. This connected the region to the capital, opening for transportation of coal and food supplies and facilitating the establishment of pharmaceutical and textile factories.

The disintegration of the Soviet Union in 1991 led to a declaration of full independence for Tajikistan on 9 September in the same year. However, the breakdown of the centrally planned Soviet economy led to subsidy withdrawals and the disruption of former guaranteed markets, which presented economic challenges to Tajikistan. Turmoil plagued the country as communists fought to retain power. The presidential election of November 1991 was won by the former communist Rahman Nabiyev, which led to nonviolent protest in Dushanbe in March 1992. The election result brought forward and escalated ethnic and regional tensions that had been part of the Soviet Union legacy and violence soon spread to the rest of the country. The preconditions for the civil war in Tajikistan were numerous, including a difficult economic situation that continued the disparity between the poorly developed regions of the south and those in the north that had endured during the Soviet era. The communal way of life of the Tajiks and their high degree of religiosity later manifested in the emergence of an Islamic democratic movement in the Tajik SSR. The Islamic Renaissance Party (IRP), the Democratic Party of Tajikistan (DPT) and a number of other movements emerged in resistance to communist rule. The confrontation between the former communist elite and the national democratic and Islamic forces thereby came to align the political sphere with ethnic and regional identities. The invasion of neighbouring Afghanistan in 1979 by the Soviet Army further exacerbated the situation as the number of unregistered arms in Tajikistan increased.

By the mid-1990s, fighting had left thousands dead and had displaced at least half a million people. Many people fled to nearby countries, including Afghanistan. At the height of the civil war in 1993, the Gorno-Badakhshan parliament decided to declare the Oblast an independent republic and seek re-incorporation into Russia. In 1994, government and opposition reached a cease-fire agreement, but fighting continued until June 1997. One article, written in 2013 in The Atlantic observes, "the civil war compounded the economic disruption caused by the break-up of the Soviet system and the people of Gorno-Badakhshan and the Karategin/Rasht valley found themselves physically and politically isolated."

On June 27, 1997, at the ninth meeting in the Kremlin, a final peace agreement was signed between representatives of the Government of the Republic of Tajikistan and the United Tajik Opposition, with mediation from the United Nations.

An annex to the agreement contained the Provision on a Commission for National Reconciliation to address the political, legal, military and civil issues arising from the conflict and to develop solutions. This commission guided the reintegration of opposition military units into

the national army, the return of refugees to their homes and the incorporation of opposition representatives into the Tajikistan government . In addition, the commission also drafted constitutional amendments, which became the basis for a draft law submitted to parliament by the president.

These amendments were subsequently passed by a national referendum held on 27 September 1999. Emomali Rakhmonov remained the president of Tajikistan (based on the results of the 1999 presidential elections), and the opposition won seats in parliament, administrative posts and director posts in a number of large enterprises. As of 1998, a "Day of National Unity" is observed as a public holiday on June 27 .

The Aga Khan Development Network has been operating in Tajikistan since 1992 to support the vision of an economically dynamic, politically stable, intellectually vibrant and culturally tolerant Tajikistan. Since then, they have contributed to stability in GBAO and helped the reintegration of former fighters into civil society as farmers or small business owners.

Despite this, unrest has occurred in GBAO more recently, whereby on 24 July 2012 the Tajik government sent heavily armed troops, armoured vehicles and helicopter gunships to Khorog after the murder of a top security forces official. A full-scale assault was launched in Khorog and its districts, in which the alleged murderers were suspected to be hiding. At least 42 people, including 12 soldiers and 30 rebels, were killed, however, other sources state the death toll as comprising 100 military personnel and 100 civilians. Residents of Khorog stated that the town resembled a warzone. Communications in GBAO were cut during that period. A halt to operations was ordered by the president the following day.

The most recent cases of unrest took place in 2018, when security forces were mobilised to address illegal activities in the city, associated particularly with drug trafficking. This created friction that built on the delicate history and role of the national government within the autonomous region.

1.5. IMPACT OF COVID-19

A report by UNDP on socio-economic impacts of COVID-19 in countries in Central Asia reveals that the economy of Tajikistan remains vulnerable to COVID-19, particularly as a result of overreliance on commodities, migrant labour, low levels of diversification, dual labour markets and inefficient social protection systems. The impact of the border closure and economic downturn in Russia has implications for Tajikistan, where approximately 500,000 labour migrants are reported to be returning home from Russia resulting in a sharp fall in remittance inflows. The currency also weakened, which made imports - especially of food products - expensive, impacting household budgets. Large gatherings were not suspended, although foreign travel into the country was limited. This includes air travel as well as border crossings, though 6 crossing points with Kyrgyzstan and Uzbekistan remained open for cargo.

TAJIKISTAN

9,321,018
Inhabitants

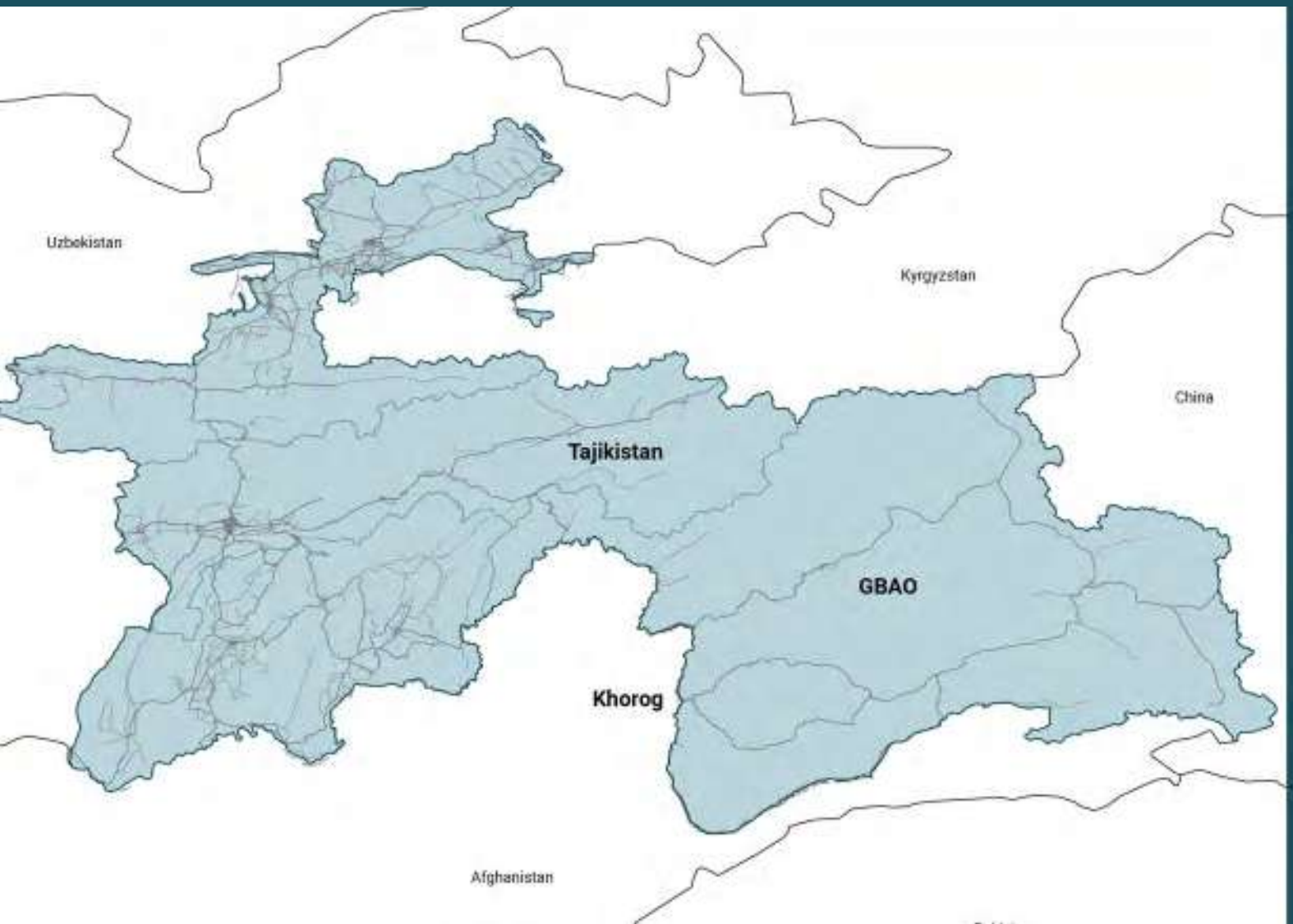
26.7%
Urban

73.3%
Rural

66% under 30

40.6% under 18

49% female



2

SNAPSHOT

2.1. TAJIKISTAN

The Republic of Tajikistan is a landlocked country located in Central Asia. Mountains occupy over 93% of its territory. The population of Tajikistan is 9.321 million. Tajikistan has one of the youngest populations in Central Asia.

In 2020, Tajikistan ranked 76th in the Human Capital Index (HCI) among 130 countries, 125th in the Human Development Index (HDI) among 189 countries in 2019, and 70th in the Gender Inequality Index (GII). The country ranked 100th among 127 countries in the Global Innovation Index (GII) in 2019 and 104th among 134 countries in the Global Competitiveness Index (GCI). Tajikistan ranks 114th in the Environmental Performance Index (EPI).

From 1997 to 2017, the economy of Tajikistan grew at an estimated 7.2% per annum, largely driven by development in the agriculture and service sector. Over the past decade, remittances of emigrated Tajiks along with state investments in industry and the construction sector have also been important sources of economic growth and poverty reduction in Tajikistan. According to the National Development Strategy of the Republic of Tajikistan for the period up to 2030, the country is expected to double its GDP in that period.

The landlocked geographic location of Tajikistan with limited land resources contributes to the country's vulnerability. Tajikistan is especially vulnerable to environmental shocks and is one of the most disaster-prone countries in the world.

Gorno-Badakhshan Autonomous Region (GBAO) is situated in the eastern part of Tajikistan, occupying approximately 64.1km2, or 44.9% of the total country area. The region has a population of 228,900 as of July 2020, making up approximately 2.4% of the total country population. GBAO is a rural region with 13.3% of its population living in the capital city of Khorog.

GBAO (Gorno-Badakhshan Autonomous Region)

228,900
Inhabitants

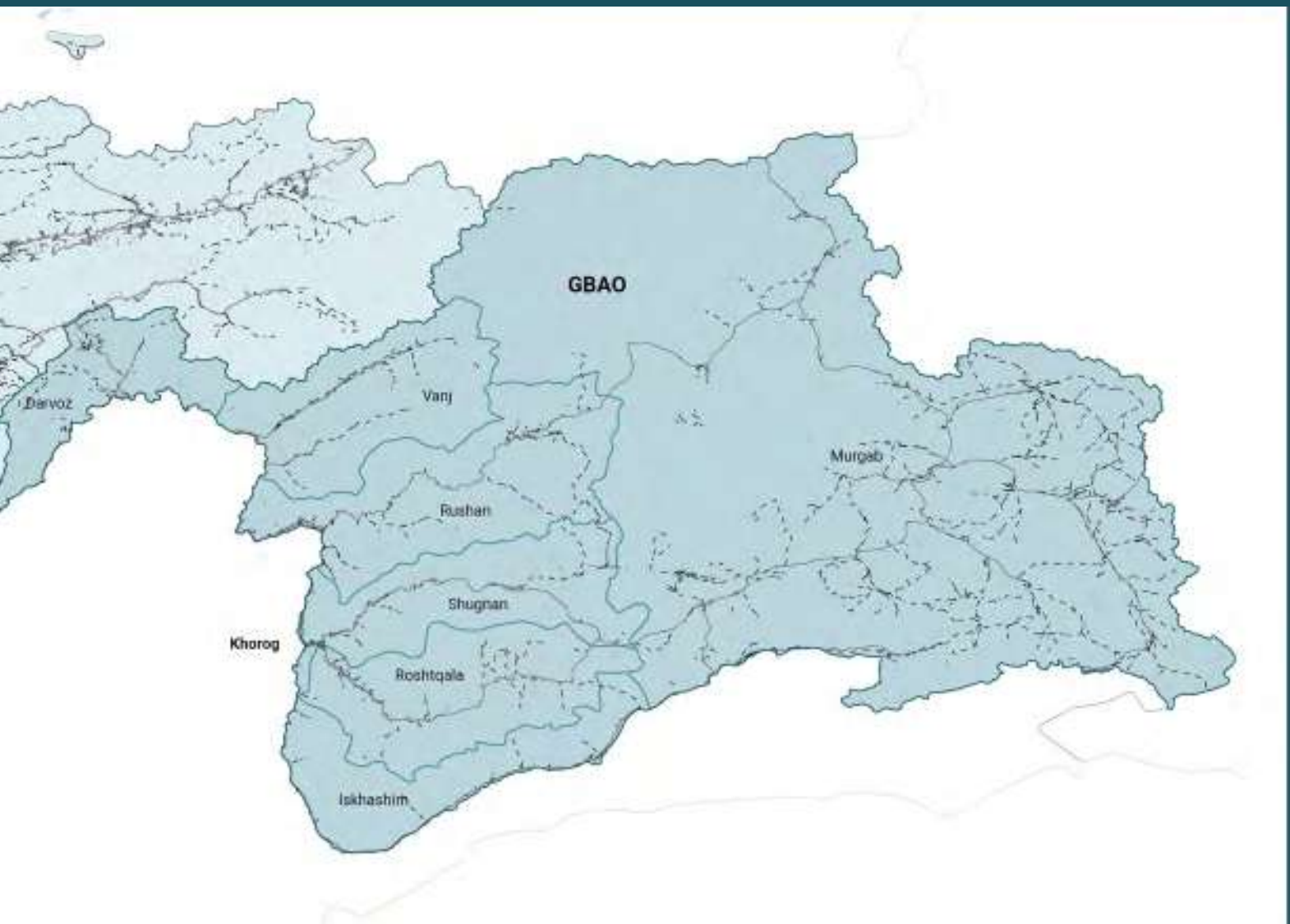
13.3%
Urban

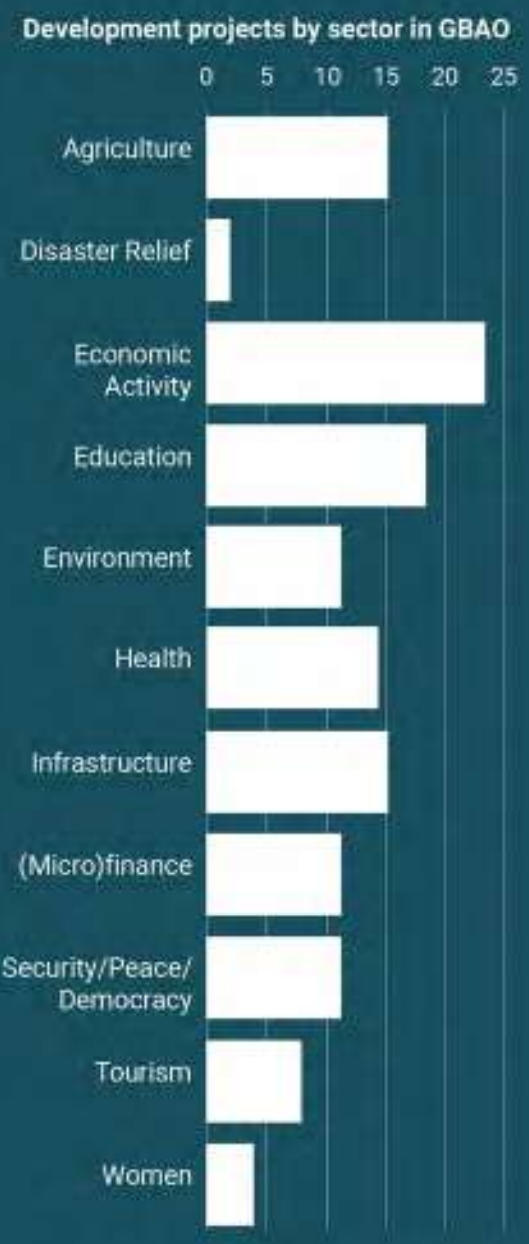
86.7%
Rural

53% under 30

29.2% under 15

48.6% female





2.2. GBAO

The administrative division of the GBAO, founded on the 2nd January 1925, has two levels: one city of regional subordination and seven districts further divided into Jamoats. Khorog, the only city in GBAO, is the centre of the region with no other urban settlements.

GBAO is home to the Pamir mountains, which are one of the highest mountain systems in the world, extending to the boundary regions of China, Afghanistan and Kyrgyzstan. GBAO is geographically divided into the Western and Eastern Pamirs. The Eastern Pamir is dominated by an arid high plateau, whereas high and steep valleys characterise the Western Pamir.

More than 50% of land in GBAO is bare soil and rock surface, limiting urban growth and settlement formation. Approximately 20% is covered by sparse vegetation, limiting agricultural production for both consumption and economic activities.

GBAO plays a strategically important role in the region, serving as the country's entry and exit points for trade and travel to neighboring countries. The region has become a niche tourism destination for mountaineers, trekkers, and wildlife admirers.

The region faces many challenges in connectivity, infrastructure provision and socio-economic vulnerability. As such, the region has attempted to address these issues through development projects. The graph highlights the number of development projects taking place in Gorno-Badakhshan.

With approximately 2.2% of the country population, Khorog has been the administrative centre of GBAO since 1925. Khorog is located on the border of Afghanistan within the Shugnon district. Khorog's population of approximately 30,500 people, comprises 80% of the district population, whilst covering only 0.3% of the district's total land area (17.5 sq km).

KHOROG

30,500
Inhabitants

0.1%
Population growth Annual)

13.3%
Of GBAO's population lives in Khorog

6/10
Adults have a source of income

2.3. KHOROG

At an elevation of nearly 2,200 meters, Khorog remains one of the highest-altitude peri-urban settlements in Central Asia. As much of its infrastructure was constructed in the 1960s and 1970s, Khorog was designed to accommodate a population base of only 15,000.

The city is located within a valley between mountains and is spatially defined by the valley topography. The Gunt and the Shakhdara rivers meet on the Eastern side of the town and flow through it, joining with the Pyandzh river in the West. The city is built around this wide river, a water source upon which the city's energy relies, notwithstanding varying water levels and freezing during winter.

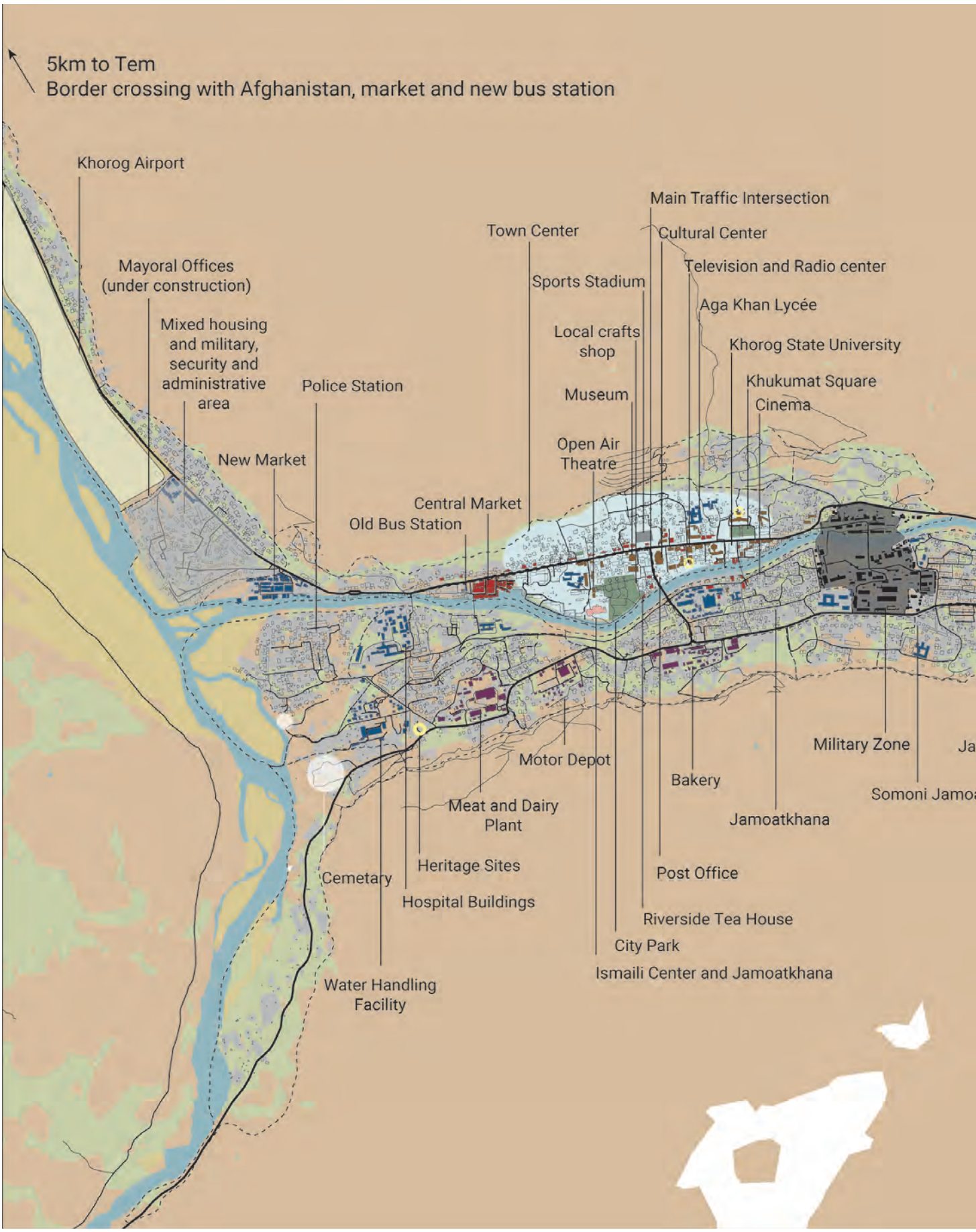
The linear city structure designed around these topographical features and associated natural hazards, limits land availability. Notwithstanding these limitations, new developments have taken place within Khorog, due in part to international aid, and have provided high quality social services and facilities, including large scale developments by the AKDN. The city is therefore, not only an administrative hub, but also a health and education center for the whole region.

Within the last 10 years, the nearby town of Tem was officially amalgamated into the city boundary. This town is located approximately 5km North of the main city centre, beyond the Airport. Tem plays an important role for the city of Khorog. The first bus station before entering the city is located there, on the line from Dushanbe to Khorog . Tem also has a bridge crossing on the border with Afghanistan. As well as providing a crossing point, predominantly for work migrants, this bridge incorporates an international market space for goods trades from both countries.

There is one central node to the city, or 'town center' that accommodates the public authority buildings, schools, and two major AKDN projects; the Ismaili Center, and City Park. A second large park, the Botanical Gardens, is located on higher ground in the East of the city. The AKDN have also initiated the first phase of the Khorog branch of the University of Central Asia (UCA) campus, alongside a new medical center.

A central market in Khorog and New Market are located alongside the main entry road into the city. Industrial facilities are located predominantly on the Southern side. Energy facilities are located on the Eastern side of the city, though a new powerplant is being built in the South Eastern side. A large military area, surrounded by a wall is located in the centre, which interrupts the city fabric.

Challenges that the city faces such as land scarcity, unplanned construction, hazard risk, climate change and economic and resource vulnerability are interlind, therefore, exacerbate each other.


5km to Tem
Border crossing with Afghanistan, market and new bus station
Khorog Airport
Mayoral Offices (under construction)
Mixed housing and military, security and administrative area
Police Station
New Market
Old Bus Station
Central Market
Town Center
Main Traffic Intersection
Cultural Center
Television and Radio center
Sports Stadium
Aga Khan Lycée
Local crafts shop
Khorog State University
Museum
Khukumat Square
Cinema
Open Air Theatre
Military Zone
Motor Depot
Bakery
Meat and Dairy Plant
Jamoatkhana
Cemetary
Heritage Sites
Hospital Buildings
Post Office
Riverside Tea House
City Park
Ismaili Center and Jamoatkhana
Water Handling Facility

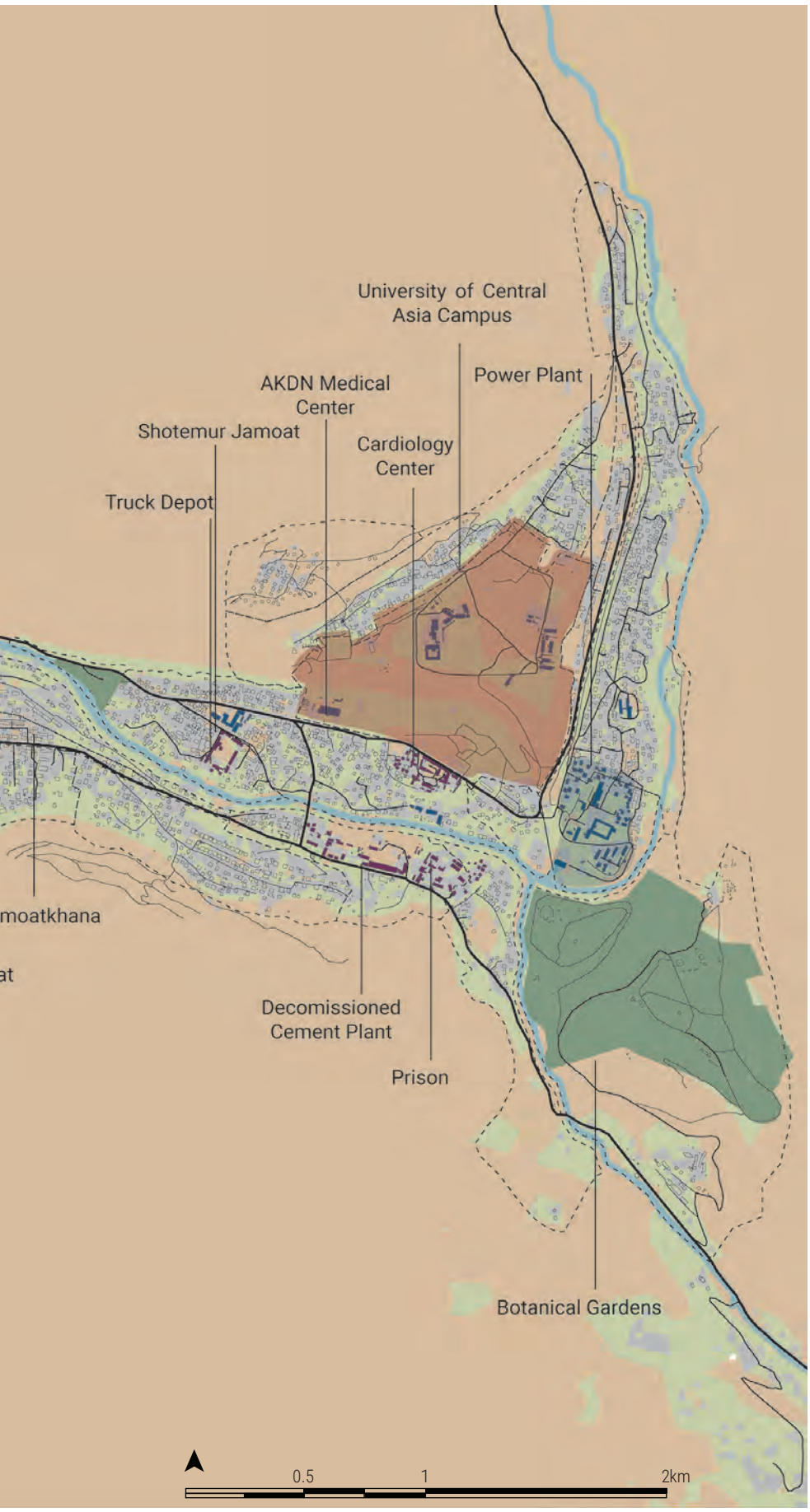


Fig 9. General Map of Khorog

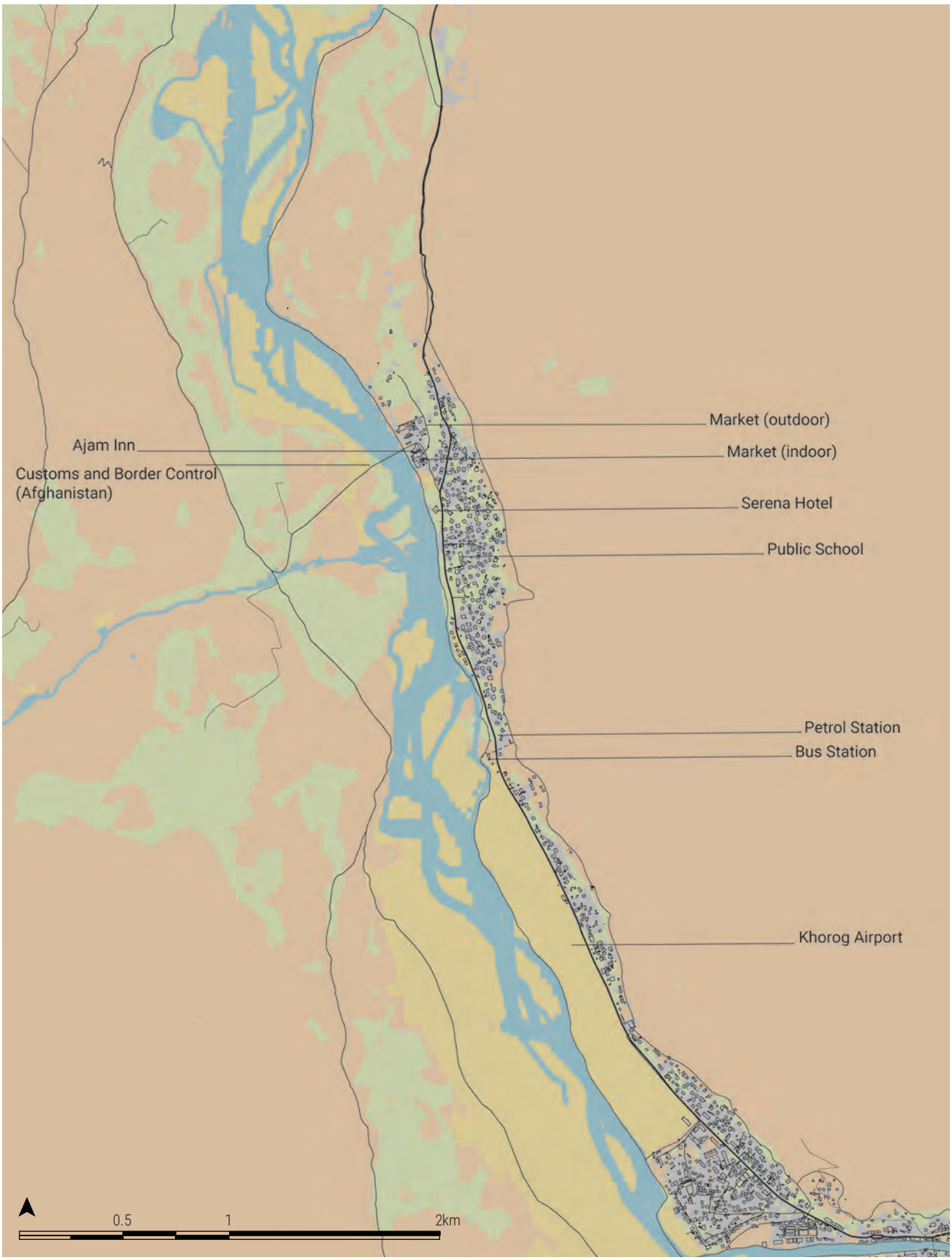


Fig 10. Map of Tem, a village that was integrated within the boundaries of Khorog within the last 10 years and plays an important role in cross-border trade and migration with Afghanistan

3

INSTITUTIONAL RESILIENCE

3.1. ADMINISTRATIVEDIVISIONOFTAJIKISTAN

Three different tiers of territorial government comprise Tajikistan's administrative-territorial division. The authority to dissolve or amend administrative-territorial boundaries is vested in the Upper House of Parliament. Subordinate to the national government and marking the 1st territorial administrative tier after the federal administration are five Oblasts (territories):

- Gorno-Badakhshan Autonomous Region (GBAO);
- Sughd Oblast;
- Khatlon Oblast;
- Town and Districts of Republic Subordinate; and,
- The Capital City Dushanbe.

Rayons and city administrations mark the 2nd territorial administrative tier at the district level. Rayons are subordinated to the according Oblasts, except for four districts of Dushanbe and 13 additional Rayons (Towns and Districts of Republican Subordination (TDRS)), which are directly subordinate to the national Government.

The 3rd territorial administrative tier is comprised of village and town governments, also called Jamoat, Shakhrak or Dekhot, depending on their population and geographic location. Jamoats, Shakhraks or Dekhots are subordinated to Rayons, with a financial dependency from the Oblasts, but are otherwise self-governing bodies.

Overall, Tajikistan is comprised of 62 Rayons. These are divided into 58 rural districts and the four capital city districts of Dushanbe. The GBAO is subdivided into seven rayons and one city, the Sughd Oblast into 14 Rayons and eight cities and the Khatlon Oblast into 24 Rayons and four cities. In total, there are 22 cities, 47 towns, 354 villages, and 3570 settlements.

Based on size, the urban settlements in Tajikistan are divided into four categories: huge (with 100,000 inhabitants or more), big (inhabitants between 40,000 and 100,000), medium-sized (between 10,000 and 40,000 inhabitants), and small-sized settlements (less than 10,000 inhabitants).

The heads of the regional, city or district state administration (also known as Khukumat) simultaneously exercise executive authority, while acting as a local council chairperson. These heads are appointed and dismissed by the President and presented to their respective councils for approval.

Towns, villages and settlements are governed by the Jamoats or Mahallas. Both Jamoats and Mahallas are local self-government bodies and the first point of contact for local communities.

3.1.1. Dushanbe – The Special Status of the Capital City

TDushanbe is the only city divided into four subordinate districts. Consequently, the council and local administration have the status of an Oblast Government. The 'Law on the Status of the Capital City' details the organisational, legal, economic and social requirements for the performance of local government functions in the capital city. The Dushanbe government institutions ensure the necessary conditions for national and international events, establish representative offices abroad, and provide for the establishment of representative offices of oblasts, cities and rayons in Dushanbe, as well as those of foreign partner cities.

Expenditures of Dushanbe's local Government are compensated from the national budget through payments for services provided by the city and fees

paid by the embassies of foreign countries and representative offices of international organisations in Tajikistan. The city of Dushanbe leases municipally owned buildings and facilities to various Tajik government institutions, as well as to representative offices of the GBAO, oblasts and rayons, as established by legislation.

3.1.2. Special Status of the Autonomous Region of Gorno-Badakhshan

TAccording to the Constitution, the Gorno-Badakhshan Autonomous Region (GBAO) is an integral and indivisible component of the Republic of Tajikistan. Despite other Majlis (assemblies), The Majlis of People's Deputies of GBAO has the right to form legislative initiatives and is granted extended social, economic and cultural competence. Tajik is the official language of the region, however, the state fosters conditions for the free use and development of the Shugnan, Rushan, Vakhan, Yazguliam, Russian and Kyrgyz languages in secondary schools and mass media within the territory.

The chairperson of the Gorno-Badakhshan Autonomous Region is appointed and dismissed by the President. The candidates are presented for approval by the Majlises of People's Deputies of GBAO. The chairperson is responsible to the higher executive authority and the corresponding Majlis of people's deputies. Furthermore, a deputy chairperson of the Tajik National Assembly shares roles as a member of the GBAO Assembly, and, similarly, one judge of Constitutional Court is also a formal representative of the GBAO.

The region consists of seven districts (subdivisions) and the city of Khorog. The subdivisions include Darvoz, Vanj, Rushon, Shughnon, Ishkoshim, Murgob, and Rostkala. Within these districts, there are 4 villages and 42 rural jamoats.

3.1.3. Khorog, Capital City of the GBAO

Khorog is divided into two settlements and urban authorities separated laterally by the river; the Ismaili Somoni Jamoat and Shirinsho Shakhtemur Jamoat. Jamoat Ismoilo Somoni lies south and Shirinsho Sholermur Jamoat lies on the north side. There are a total of 15 sub-districts, and 12 mahallas. The three areas within the city that do not have Mahalla status are: Energetik, an area devoted entirely to hydropower infrastructure, the Military Area (which is inaccessible to citizens), and the botanical garden of Botsad.

Fig 11. The area of the former bread factory, May 2021

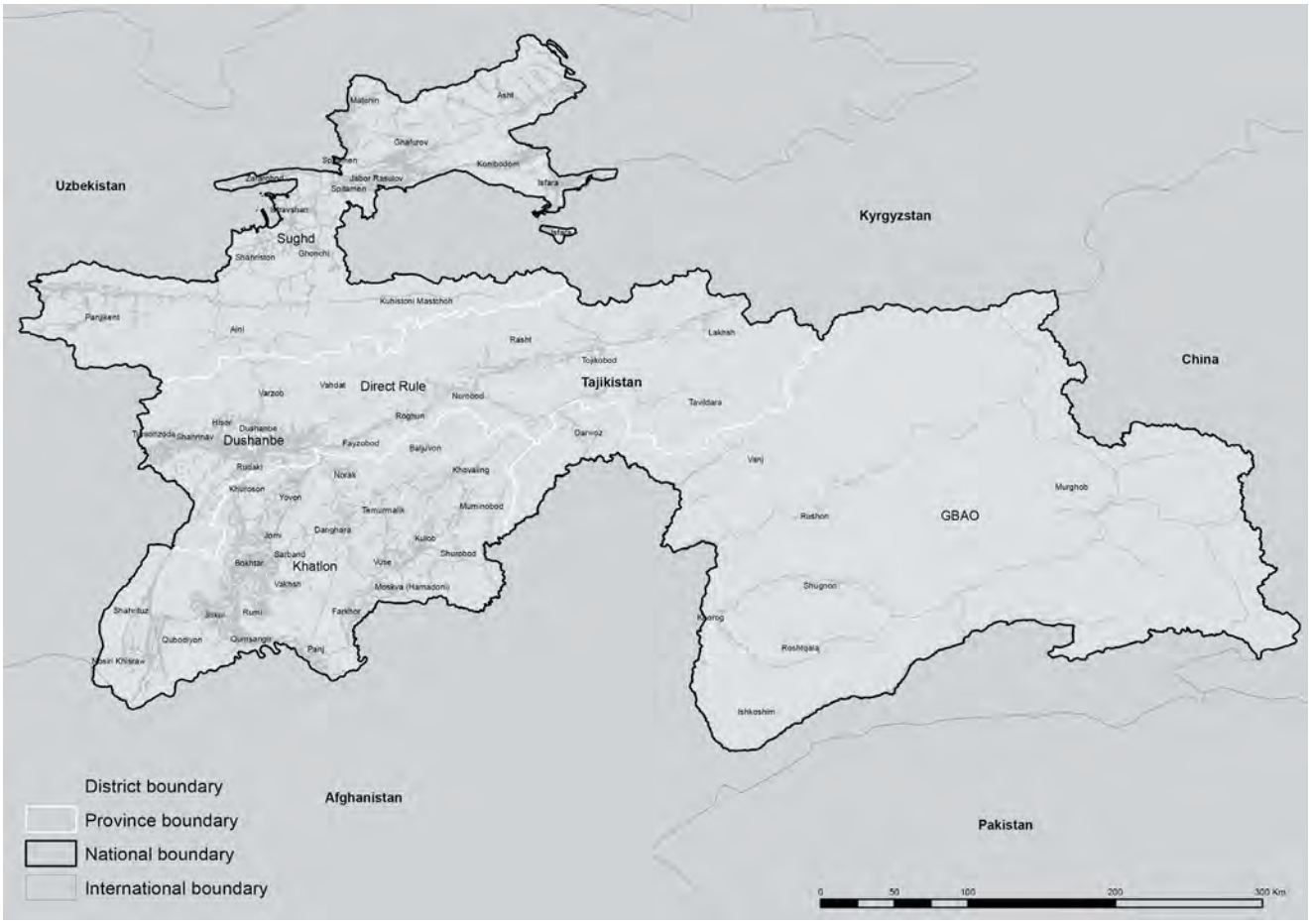


Fig 12. Tajikistan's administrative boundaries

	1st administrative level	2nd administrative level	3rd administrative level
National Government	Oblast	Districts / Rayons	Jamoats, Shakhraks, Dekhots
	Dushanbe (capital city)	4	
	Sughd	14	7
	Khatlon	24	4
	Gorno-Badakhshan Autonomous Region (GBAO)	7	42
	Towns and Districts of Republican Subordination (TDRS) (13)		

Table. 1. Tajikistian's territorial-administrative division

Urban settlements	Huge	Big	Medium	Small	Total
Total urban settlements	4	6	39	29	78
Inhabitants	1,265,200	311,800	739,600	122,300	2,438,900
Total cities	4	6	8		18
Inhabitants	1,265,200	311,800	164,200		1,741,200
Total villages			31	29	60
Inhabitants			575,400	122,300	697,700

Table. 2. Urban settlements in Tajikistan

3.2. NATIONAL DEVELOPMENT AGENDAS

Tajikistan has two main long-term development strategies, the National Development Strategy for the period to 2030 and the Sustainable Development Transition Concept (2007-2030). Tajikistan could benefit from an overarching strategy defining the country's development objectives up to 2050 in the context of the Paris Agreement, which Tajikistan ratified in 2017. A mid-century strategy against which shorter-term documents could benchmark their objectives could help Tajikistan avoid costly lock-in to unsustainable development pathways, such as the recent pivot towards coal-fired power plants intended to diversify its electricity generation capacity.

The 2003 Law on State Forecasts, Concepts, Strategies and Programs of Socioeconomic Development defines a hierarchy of documents ranging from long-term socio-economic development "concepts" (15 years, adjusted every 5), strategies (10 years, adjusted every 5) and programs (3-5 years). In practice, however, the timelines aligned with the categories of 'concept', 'strategy' and 'program' seem to vary. For example, The Sustainable Development Transition Concept (2007-2030) covers a 24-year period, while the 2016 National Development Strategy for the period until 2030 covers 15 years. A well-defined hierarchy that structures an interrelationship between long-term concepts and medium to near-term programs and plans, allows goals outlined in lower-level documents to be clearly linked with longer-term objectives. In Tajikistan's existing strategic documents, these links appear not to be articulate. For example, the National Development Strategy does not refer to the Sustainable Development Transition Concept, despite several overlapping goals.

The National Climate Change Adaptation Strategy to 2030, was approved by the national government of Tajikistan in 2019, however, Tajikistan lacks a dedicated environment ministry. The Committee on Environmental Protection, which is not an integral part of the government but rather, a body subordinate to it, is responsible for writing environment-related policy. The Committee lacks the authority to influence coordination bodies to facilitate consultations on policies and strategies with environmental impacts. This is reflected by low levels of integration of ecological concerns across sectoral documents.

3.2.1. Country Programmes Developed with the Involvement of UN Agencies

Tajikistan joined the United Nations in March 1992 and subsequently established cooperation with several United Nations (UN) bodies. The country became a member of the United Nations Economic Commission for Europe (UNECE) and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and collaborates with the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF). Tajikistan has also signed agreements with international financial institutions, including the Asian Development Bank (ADB) and the World Bank (WB). Tajikistan is a member of several regional and sub-regional organisations and forums, including the International Fund for Saving the Aral Sea (IFAS), the Interstate Commission for Water Coordination (ICWC), the Interstate Commission on Sustainable Development (ICSD), and the Economic Cooperation Organization (ECO). In general, these organisations or forums include Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

In 2007, the Government adopted the Concept of Transition towards Sustainable Development for the period 2007–2030. The Concept defines overall priorities, strategic objectives, tasks and implementation stages for the achievement of the Sustainable Development Goals. The Concept's core deals with poverty reduction, energy security, food safety, social security, environmental sustainability, and good governance. Tajikistan also works on sustainable development in partnership with the other Central Asian countries through the Interstate Commission on Sustainable Development (ICSD).

In 2016, Tajikistan developed and adopted its National Development Strategy 2030 (NDS-2030) for further implementation of the SDGs in Tajikistan. The NDS-2030 sets out to improve the living standards and welfare of the population as its top goal for the long-term development of the country. It employs the "Concept 4+1" to define the structure of the strategic national goals and priories listed as follows :

1) ensuring energy security and efficient use of electricity;
2) overcoming communication deadlocks and transforming Tajikistan into a transit country;
3) ensuring food security and population access to quality nutrition; and
4) expansion of productive employment.

Due to Tajikistan's limited human and financial resources, the implementation of Multilateral Environmental Agreements (MEAs) depends largely on external cooperation and support. Foreign investments are also essential to assist the country in dealing with environmental challenges.

Main strategic documents	Status	Time Horizon	Sectoral Coverage	Main objectives
First Nationally Determined Contribution (NDC)	Submitted in 2017	2017-2030	Economy, Water, industry, Transport, Energy	• Unconditional target: not to exceed 80-90 per cent of the 1990 level of greenhouse gas emissions by 2030, 1.7-2.2 tons in CO2e per capita • Conditional target: target of 65-75 per cent of the 1990 level of greenhouse gas emissions by 2030, 1.2-1.7 tons in CO2 per capita • Primary adaptation tool: strategic documents outlined in this table
National Development Strategy	Adopted in 2016	2016-2030	Governance, planning, transport, energy, water, industry	• Industrial development through the implementation of infrastructure projects and promoting the rational use of land, water and energy resources • Develop an effective public administration system • Human capital development, focusing on improving education levels, science, health, social protection, living environments and social equality • Improve investment climate and promote growth in the financial sector • Increase access to water supply systems and sanitation, and electricity generation • Improve connectivity, especially to neighbouring countries and key markets, by developing transport and telecommunications
Improving Access of the Population to Clean Drinking Water	Adopted in 2006	2008-2020	Water	• Rehabilitate existing water systems and construct new centralized water supply with the use of modern technology • Construct local water supply systems • Introduce modern methods of water disinfection • Promote a more efficient use of water resources
Water Sector Reform	Adopted in 2015	2016-2025	Water	• Implementation of integrated water resource management • Institutional reforms in the water sector to promote transparency and create accountable structures • Transition from administrative-territorial water resource management to management within hydrological and hydrographic zones
Programme of transport Development	Adopted in 2011	2011-2025	Transport	• Develop a set of measures that promote consistent development of transport infrastructure • Create a national transport network, in compliance with established safety standards • Promote free competition in domestic and international transport service markets
State Policy for Attraction and Protection of Investment	Adopted in 2012	No defined timeframe	Governance, Industry	• Increase investment in infrastructure projects • Modernise production processes by updating material and technical base • Improve effectiveness of the regulatory policy within the investment sphere
Concept of Transition to Sustainable Development	Adopted in 2007	2007-2022	Governance, planning, transport, energy, water, industry	• Establish an effective form of governance • Ensure energy security, as well as social security • Promote environmentally sustainable production
Concept of Environmental Protection in the Republic of Tajikistan	Adopted in 2008	No defined timeframe	Governance, energy, water, industry	• Promote environmentally friendly practices across all economic sectors • Develop an environmental monitoring system • Protect and promote the rational use of land and water resources • Improve the welfare of the population

Table. 3. Main strategic documents in force in Tajikistan

3.3. GOVERNANCE

3.3.1. National Actors and Roles

After the collapse of the Soviet Union and Tajikistan's declaration of its independence on 9th September 1991, the Constitution of the Republic of Tajikistan was approved in November 1994. The laws on local government and on local government bodies, adopted by the parliament initiated the reform of governance structures according to the new Constitution.

The law on local self-government and local finance, passed on 23rd February 1991 by the Supreme Soviet of the Tajik Soviet Socialist Republic, initiated the establishment of local self-government and the revision of the administrative-territorial structure according to principles of decentralisation. The resulting organisation was based on Soviet legal traditions. In accordance, in December 1994, Parliament adopted the Constitutional Law on Local Public Administration and the Law on Self-Governance in Towns and Villages. The objectives of the reform were:

- The abolition of Soviet power;
- Decentralisation of management for the needs of the population;
- A clear definition of the role of territorial centres;
- Development of mechanisms for resolving conflicts without infringing on the interests of various levels of Government; and,
- Functional separation of representative and executive bodies at each government level, with improved interaction and accountability.

The new Constitution established norms for the division of power at the local government level. The role of local councils today, includes approving local budgets, reviewing budget execution reports, determining the direction of social and economic development within the territory, setting local taxes and fees and managing communal property.

The new Constitution set out Tajikistan's presidential system of power. The president of Tajikistan simultaneously acts as government chairman and appoints the prime minister and other members, to be approved by parliament. The Republic of Tajikistan has a bicameral Parliament, composed of a lower house, the Majlisi Namoyandagon (Assembly of Representatives), and an upper house, the Majlisi Milli (National Assembly). The Assembly of Representatives acts on a permanent and professional basis and is elected in ananym, universal, equal and direct votes.

The National Assembly is constituted differently. Three-fourths of the members are elected indirectly at local council meetings of the GBAO and its cities and districts, the regions and their cities and districts, Dushanbe and its districts, and the cities and districts of national subordination. The three oblasts and the city of Dushanbe (which has oblast status), all have equal numbers of representatives, regardless of population size. The remaining quarter of the National Assembly is appointed by the President directly.

The state structure directly influences multi-level coordination which is highly important to balance decision making processes. The National Government authorities approve the general plans of the provincial capitals (such as Khorog), the city of Dushanbe, and cities and districts of the Region of Republic Subordination. It is also responsible for submission of the State Complex Administrative Territorial Division Scheme and local administrative territorial division plans for approval to the Majlisi Milli Majlisi Oli (the Upper Chamber of Parliament). Local-level management takes place in parallel with the national government. A significant part of national development for the Republic of Tajikistan is currently assigned to local state governing bodies and local self-government institutions of townships and villages, as outlined in the 2015 Concept of Local Development Management in the Republic of Tajikistan for the period up to 2030. The purpose of this document is to provide adaptation to rapidly evolving strategic development objectives and territorial governance of local management through the formulation of the main directions and political, organizational and legal foundations. It brought local bodies into a national approach to development and implementation of medium- and long-term programs and plans via local socio-economic development.

Although some efforts have been made on decentralization, the tiers of urban planning governance are still somewhat dominated by vertical coordination, outlined as follows:

There are a series of superior organizations that govern issues of urban and climate planning at the state level. Those are the Committee for Architecture and Construction and the Committee for Environmental Protection which fall under the Government of the Republic of Tajikistan. These bodies have their representative offices and departments in each region

and city of Tajikistan, which regulate the tasks entrusted to them by executive orders, decrees, etc.

The structure of the central office of the Committee for Architecture and Construction under the Government of the Republic of Tajikistan includes:

- Headquarters management;
- Urban Development Department;
- Department of Science and Regulatory Regulation in Construction;
- Construction management and integration process;
- Department of Industry, Transport and Energy Programs;
- Case management;
- Planning and accounting department;
- Legal department;
- Human Resources Sector.

The powers of this body include implementation of state policy in the field of architecture and urban planning, such as construction of facilities, cities and villages, development and maintenance of an urban planning cadastre, development of state programs for architecture and urban planning, project concepts based on scientific research, control over the implementation of the state complex territorial organizational plan of regions and other administrative-territorial units of the Republic of Tajikistan, General plans of cities and settlements etc.

The structure of the Central Office of the Committee for Environmental Protection under the Government of the Republic of Tajikistan includes:

- Headquarters management;
- Monitoring and Environmental Policy Department;
- Management of affairs (sectors general, personnel, legal, special work and economic);
- Department of Planning, Accounting and Finance;
- Department of State Control over the Use and Protection of Water Resources;
- Department of State Control over the Use and Protection of Flora and Fauna;
- Department of State Control of the Use and Protection of Atmospheric Air;
- Department of State Control over the Use, Protection of Lands and Waste Management;
- Sector of International Relations;
- Hydrometeorology Sector.

Fig 13. GBAO administrative boundary

The powers of this body include implementation of a unified state policy in the field of environmental protection, hydrometeorology, rational use of natural resources and the exercise of state control over environmental protection and natural management.

3.3.2. Regional (GBAO) Actors and Roles

Gorno-Badakhshan Autonomous Region was first described as an autonomous region/oblast in the 1924 Tajikistan constitution. However, near absolute autonomy was afforded as a result of the civil war in 1997. The GBAO Assembly is the only legislative body in this territory; it initiates legislation within its territory, and consent is required for any administrative or territorial restructuring in the GBAO.

As explained in the chapter 3.1.2, the heads of regional, city or district state administration (khukumat) wield executive authority and act as local council chairmen. These heads are appointed and dismissed by the president and presented to their respective councils for approval. The GBAO administration operates through boards, committees, departments, sections and similar divisions. The GBAO Chairman has the right to issue and cancel licenses for private institutions in the education and health sector, in coordination with the government of the Republic of Tajikistan. The city's mayoral position is currently held by Alisher Mirzonabot. In August 2020, the chairman of GBAO was replaced.

The powers of GBAO are regulated by the national laws of the Republic of Tajikistan and in the field of architecture and urban planning include the following:

- Monitor compliance with legislation on urban planning and ensure the safety of housing stock and public and industrial facilities;
- Resolve issues of resettlement
- Development of engineering, transport and social infrastructures;
- Perform the role of a customer of the creation of urban planning documentation, for the construction of objects of local importance, as well as to provide their financing;
- Make decisions on construction of buildings and other structures;
- Restrict, suspend and prohibit local urban planning activities if they do not meet the requirements of legislation (through judicial proceedings, except for cases of restriction and suspension of activities for a period not exceeding 10 working days in connection with the prevention of emergencies and other real threats to the life);
- Develop general plans for cities and regional centres of the respective territories and, in accordance with established procedure, submit them for approval by the Government of the Republic of Tajikistan;
- Approve general plans for urban and rural settlements, projects of detailed planning, building areas and other structural elements of settlement planning in agreement with the authorized state body in the field of urban planning to be submitted for approval to the relevant Majlis of People's Deputies;
- Carry out the development and implementation of planning schemes for the territories of the Gorno-Badakhshan Autonomous Region, including schemes and projects for the development of engineering, transport and social infrastructures, as well as municipal improvements;
- Approve planning designs of the district (groups of districts);
- Establish the special regulation boundaries of objects of urban planning activities of local importance and the procedure for regulating urban planning activities in the territories of the corresponding objects;
- Provide financing for, and development of urban planning documentation for settlements, scientific research in the field of urban planning, maintaining a state urban planning cadastre, monitoring urban planning facilities, conducting comprehensive engineering surveys, compiling seismic zoning maps for settlements, monitoring the implementation of urban planning documentation with appropriate expertise;
- Regularly inform the population about the decisions taken regarding urban planning activities.

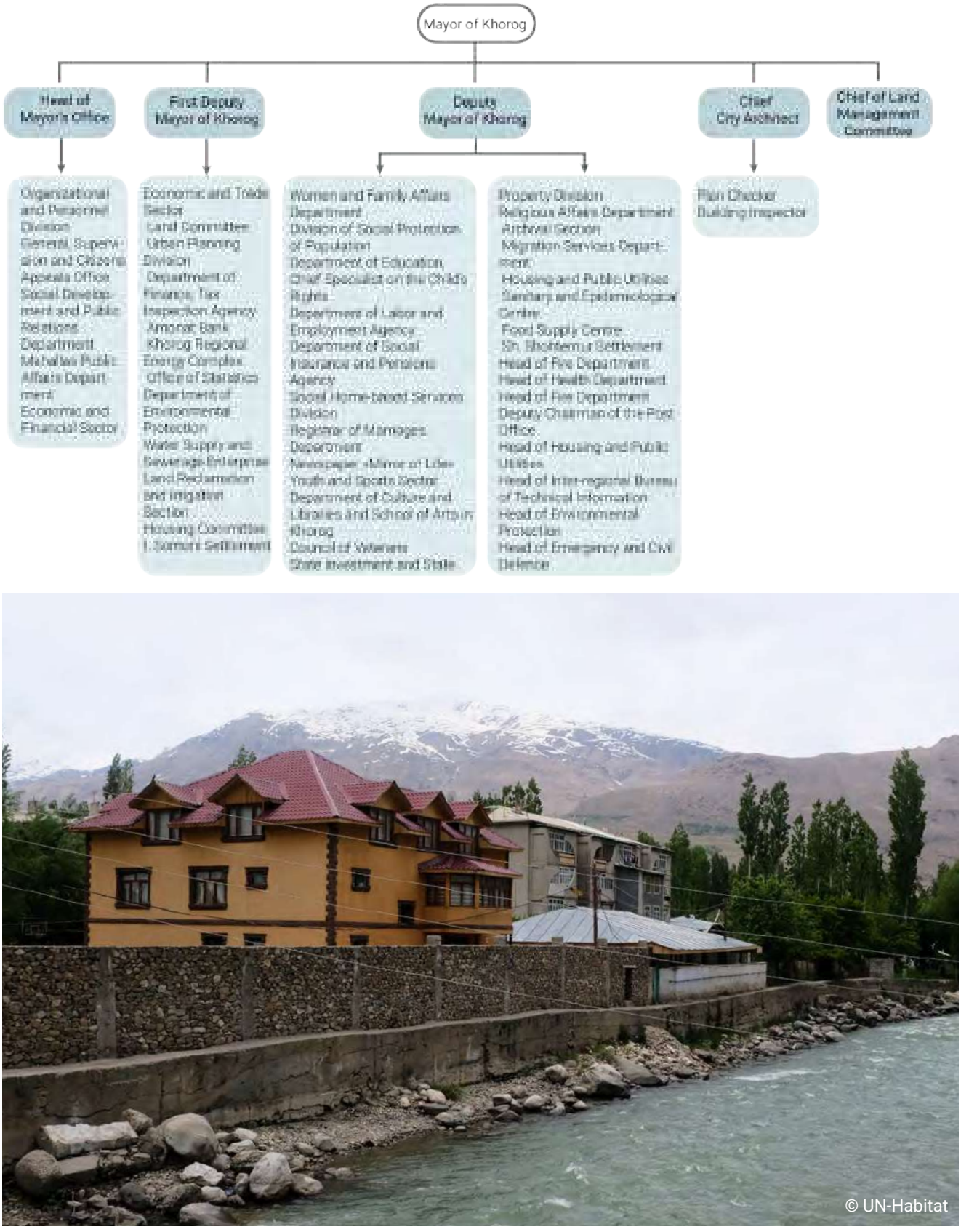


Fig 15. Housing along the riverfront, May 2021

3.3.3. Local (Khorog) Actors and Roles

Khorog's governance system is a three-tiered system organized between governing bodies of the central government, the GBAO, the rayon authority, the city Khukumat and local Jamoat. The current chairman of the local executive body, or city Khukumat in Khorog was elected in 2018, after a period of instability. The appointment and dismissal of this position is the responsibility of the national President, after which it is approved by the relevant local council. The city Khukumat falls under the authority of both the central government and the chief of staff at the GBAO level. The local council may be replaced by a higher council or can disband voluntarily. Elections of local council members and official positions are open to all political parties and community organizations, ethnicities, gender, education, religion, and occupation above the age of 18, according to the 1999 Law on Local Council Elections.

The local branches of executive power (khukumats) are responsible for the elaboration of administrative territorial division schemes, general plans and detailed urban development plans together with the Committee for Architecture and Construction . The former is also responsible for allocation of land plots for construction projects in accordance with the Land Code.

Three legal frameworks lay the foundation for local governments; the Constitution, the Law on Local Public Administration as well as the Law on Local Self-government in Villages and Towns. These laws provide local governments with independent budgets. The constitution grants local governments sovereignty over budget generation mechanisms such as local fees, taxes and duties, and spending allocation.

The Jamoat chairman is nominated by city or Rayon chairman and elected by the Jamoat. The chairman's decisions may be appealed by the city or Rayon council. Jamoat responsibilities include both the implementation of the National Constitution, national and local government policies, and programs and projects to improve quality of citizen life. Local self-governments resolve issues within their competence directly or through their representatives.

Jamoats have been formed to address issues directly affecting the interests of the population in their respective territories. Although it is not an official public body, the head of the Jamoat is selected by the district chairperson. Both Khukumats and Jamoats play a critical role in developing and applying tools for land-use planning and zoning, land management, environmental compliance and standards, infrastructure development, investment promotion and awareness campaigns.

Barriers to the exercise of city Khukumat and Jamoat authority over certain sectors may be a result of a low level of integration between the three-tier governance system. This highlights the challenges associated with the government's decentralisation as well as integration between local, regional and national bodies. This is due in part to a history of ineffective technical and capital management and planning by Jamoats and city Khukumat. There appears to be some absence of participatory processes in decision making of these entities that relates to development priorities, resource allocation and local government accountability for public service delivery. However, other sources suggest that some collaboration between local and Jamoat governing bodies exists, particularly the appointment of Jamoat representatives, territorial planning and socio-economic programs. Furthermore, citizen participation can take place in a public appeal of decisions made by the council chairman.

In addition to Jamoats, there are some important grass-roots organizations that are not recognised in the governance structure of Tajikistan, such as mahalla committees, micro-rayon councils, apartment block councils, kishlak organizations in the Pamirs and local citizens associations such as Guzar and Tabagy. The Aga Khan Foundation has launched a program to support mountain communities by creating village-based organizations to stimulate self-government in mountain villages, particularly in GBAO. These groups help to implement the European Charter of Self-government (15 October 1985) and the Model Legal Act of the Interparliamentary Assembly of CIS Countries on Common Principles of Local Self-government Organization (24 November 1995) within the country.

According to the Law on Local Public Administration, *"Local self-governments are institutions of legislative and executive authority, elected by the citizens of a given administrative territory. These institutions freely and independently govern the community, serving the needs of the local population following the constitution and legislation. The main principles of local self-governance include the coordination of local and national interests; the direct participation of the citizen in local council elections, referenda and public hearings; accountability of local self-government institutions and to the population and ensuring the legality, social justice as well as local financial autonomy. Local governments possess own authorities in addition to those delegated by the central Government, and autonomously propose initiatives, make decisions and implement activities."*

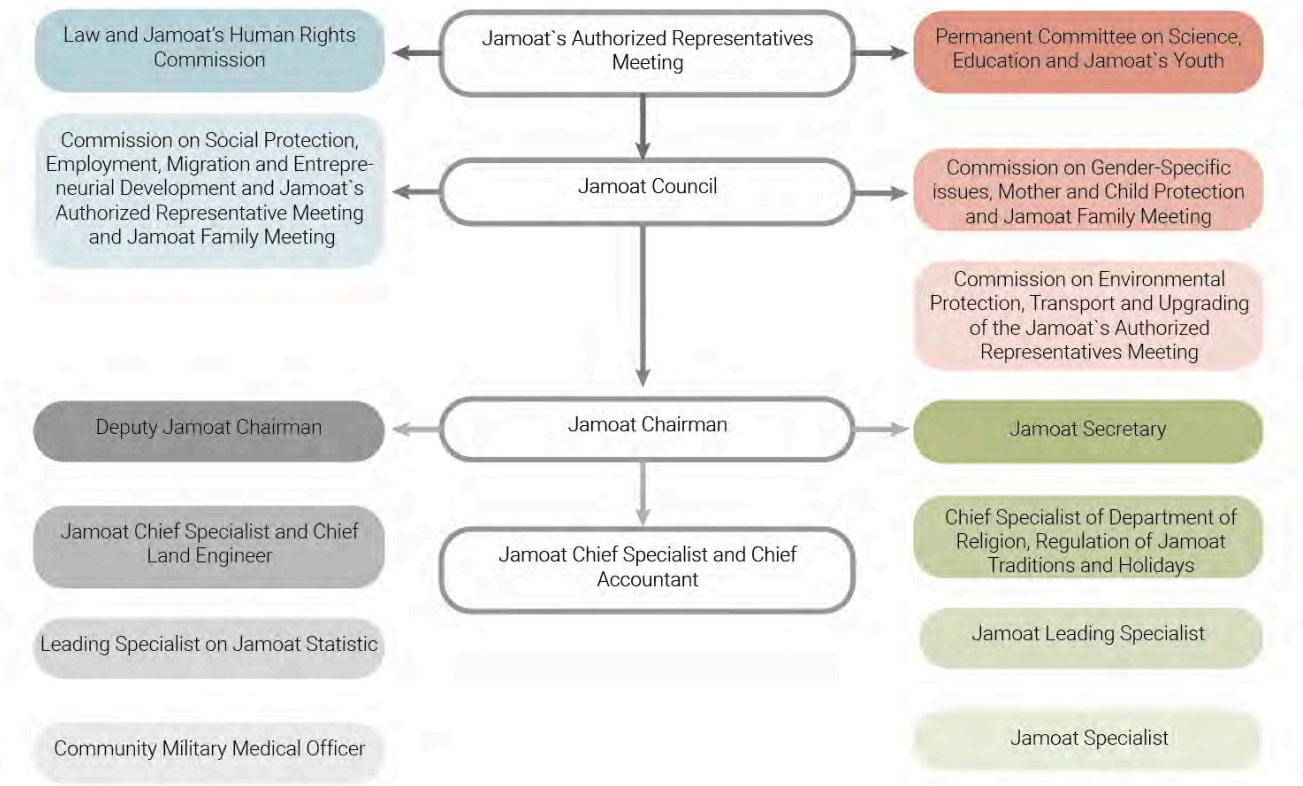


Fig 16. Jamoat's structure

The most relevant of these self-governing groups for Khorog are Mahallas. Mahalla translates to "neighbourhood" and embodies a "village" or "street committee". Mahallas are able to register as social institutions, open bank accounts, organize community events, and issue certificates of temporary or permanent residency. Mahalla leaders have the highest level of citizen accountability of any public organization. Both Jamoat councils and Mahalla constitute a local institutional basis through which to support transparent, inclusive local development investments and initiatives. However, it may be important for Mahalla committees to be more contextually representative, considering the growing youth population and gender diversity.

3.3.4. The Aga Khan Development Network

The Aga Khan Development Network has been present in Tajikistan since 1992. The network is formed by a group of private development agencies established by the Aga Khan IV, 49th spiritual leader of the world's 15 million Ismaili Muslims. The Aga Khan therefore has both a spiritual and political influence.

The AKDN has created partner organisations to respond to context-specific challenges, and through which to mobilise funds and technical expertise. The AKDN took over some of the responsibilities that the state had fulfilled prior to the dissolution of the Soviet Union and plays a role in the coordination of the development efforts of the international aid system and of the population of GBAO region. It has built up the legitimacy and functionality of local governance systems to facilitate cooperation with government authorities and NGO's.

Notwithstanding the number of international aid organisations that are present in the GBAO and Khorog, the AKDN has had one of the most significant impacts in the area. As an organization that maintains "authority without territory", the AKDN has also provided a consolidated, centralized institutional network for Ismaili communities within the GBAO and internationally.

Specifically, within Khorog, AKDN investments include the following:

Among other projects, the AKF in Khorog have:

- Founded the Mountain Societies Development Support Program (MSDSP) for rural development in 1998
- ·Collaborated with the Institute of Professional Development (IPD), a Tajikistan government agency
- Supported the work of Aga Khan Health Services (AKHS) by mobilizing resources and providing technical assistance
- Set up a Civil Society Program to strengthen civil

society organisations (CSOs) in 2006
- Driven regional infrastructure projects, including bridges and road construction and maintenance

Finally, the Aarhaus Centre was set up in Khorog in 2011 to facilitate partnerships among government and civil society, and to support small and medium sized businesses, farming communities and market infrastructure. This centre supports the agreement made at the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (1998).

Fig 17. AKDN's organizational structure and areas of work

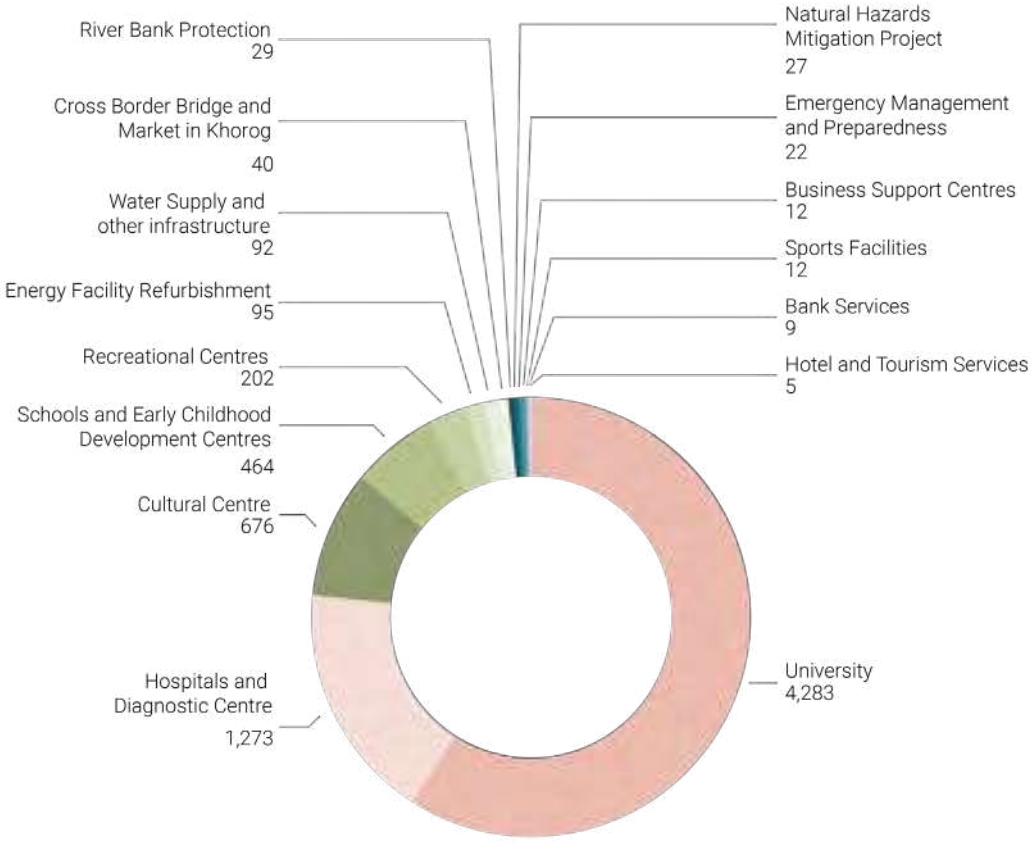


Fig 18. AKDN investment in Khorog (per. 100,000 tjs)

3.4. PLANNING INSTRUMENTS AND PROCEDURES

3.4.1. Urban Planning Instruments

In 2012 the Parliament of the Republic adopted the Town Planning Code of the Republic of Tajikistan as part of the efforts to improve urban legislation.

As of November 2020, general plans have been developed and approved for more than 90% of cities and regional centres. The following categories of strategic urban planning documents are applied in the field of territorial planning:

Documentation on development planning for the entire territory of the Republic of Tajikistan, including:

General scheme of settlements on the territory;

- Planning schemes for the development of smaller regions of the territory, sometimes including multiple discrete regions (consolidated schemes of urban planning);
- Scheme of territorial planning for the Republic;
- Sectoral schemes for territorial development

Documentation on development planning for the territories of the Gorno-Badakhshan Autonomous Region, regions, and districts:

- Schemes for planning the territories of the GBAO, regions, Dushanbe city, cities and districts;
- The planning design of the district (or groups of districts) is approved by Khukumats and includes:
  - the main development directions for the territory of the district (or groups of districts), taking into account the particularities of socio-economic development, natural and climatic conditions and population forecasts;
  - territorial zoning and planning structure;
  - measures to protect the territory of the district (or groups of districts) from the impact of natural and man-made emergencies;
  - Development directions in engineering, transport and social infrastructures of inter-settlement significance;
  - reserve areas for the development of settlements;
  - territories for individual housing construction, placement of horticultural and gardening associations;
  - territories for civic recreation areas;
  - Settlement boundaries and suburban city areas.

Documentation on the development of settlement territories:

- General urban settlement plans according to Article 51 of the Town Planning Code, which defines the following issues:
  - the main directions for territorial and settlement development, considering the particularities of socio-economic development, natural and climatic conditions and population forecasts;
  - territorial zoning and the sequence of their development;
  - measures to protect the settlement territory from the impact of natural and man-made emergencies;
  - the development of engineering, transport and social infrastructures;
  - the ratio of the built-up and undeveloped territory of the settlement;
  - reserve areas for settlement development;
  - Settlement boundaries.
- Designs of city and village boundaries;
- Sectoral schemes for settlement territory development.

Documentation for the development of residential areas:

  - Project of detailed urban planning;
  - Project development;
  - Design documentation for the construction of structures.

3.4.2. Urban Planning Procedures

The urban planning procedure for cities in Tajikistan includes the following steps and actors:

- The Government represented by a regional Chairman files a request indicating the necessity for a General plan of a particular city;
- Design Institute (e.g., the OJSC "Shahrofar") receives such a request from the Chairman indicating particularities for city development (such as, for example, the recommended building heights in the city as a percentage,

the population forecast figure, or the necessity to strengthen certain economic sectors such as agriculture or manufacturing, etc.). These assessments inform the development of the General plan.

- After finishing work on the draft of the General Plan, its authors organize a presentation for the Chairman of the region, the mayor of the city, local deputies, representatives of local authorities and the public. At this presentation, local authorities and the public make their comments and recommendations on the Plan, to be further considered. There can be several presentations before reaching a final decision;
- After discussion and amendment of the draft General Plan, it's submitted for consideration by the Town Planning Council under the National Government, with the participation from the Chairman or Deputy of the Committee for Architecture and Construction. This meeting is attended by representatives of the main architectural and construction departments of the city, representatives of utilities companies and other parties related to urban planning. However, in practice, both at this stage and the previous, public participation in the decision-making process for the preparation of general plans is very limited. In addition, the information provided by local governments on the current status of General plans and their updates is usually very limited. This leads to confusion among the population about plans to build new homes and creates uncertainty about the future. This, in turn, can lead to illegal development and eviction;
- In the absence of comments from the participants of the Town Planning Council, the amended Genal Plan is sent for approval to all ministries and departments of the Republic (28 organizations, namely: the Committee for Architecture and Construction; Local Development Committee; The General Prosecutor's Office; Agency for State Financial Control and Anti-Corruption; Ministry of Justice; Ministry of Finance; Ministry of Agriculture; Ministry of Education; Ministry of Energy and Water Resources; Ministry of Labour, Migration and Employment of the Population; Ministry of transportation; Ministry of Economic Development and Trade; Ministry of Health and Social Protection of the Population; Ministry of Culture; Ministry of Industry and New Technologies; Ministry of Defence; Ministry of Internal Affairs; State Committee for National Security; Statistics Agency; Agency for Land Reclamation and Irrigation under the Government; State Committee for Investments and State Property Management; Committee for Emergency Situations and Civil Defence; Environmental Protection Committee for Environmental Protection; State Committee for Land Management and Geodesy; State Unitary Enterprise on "Housing and Communal Services"; OJSCHK "Barqi Tojik" (Tajik electricity); Main Department of Geology under the Government; Service for State Supervision of Safe Work in Industry and Mining Supervision under the National Government. Each of these studies the explanatory note and can make its own comments, which the author must consider. If the General plan has passed all reviews and received their approval, then it is submitted to the government for consideration and approval;
- After the approval by the government, a decree is issued, and the General Plan comes into force for 20 years . Its copy is sent to the Committee for Architecture and Construction, and to the local Architectural Department, namely to the Chief Architect of the city or region. The local department of architecture in the region or city is responsible for ensuring its compliance. After approval, any General Plan is classified as "top secret", thus limiting access. Therefore, the person responsible for its implementation must have the appropriate clearance level;
- Local government bodies govern the development of all buildings in the city in accordance with the approved General plan and its zoning specifications. The body regulating the implementation of the General plan is the Main Architectural Department of the city or region (e.g., Khorog), represented by the Chief Architect of the city or region. The Chief Architect is responsible for the construction and planning processes in the city (e.g., Khorog) and regulating development in accordance with the General plan.
- The branching of organizations through which the General Plan must pass for its adoption is quite extensive. On the national level there is the OJSC "Shahrofar" design institute that is a leading urban and territorial design planning organization of the Committee for Architecture and Construction of the Republic of Tajikistan. Throughout the 1990s, due to the civil war and resulting socio-economic challenges, activities related to master planning were

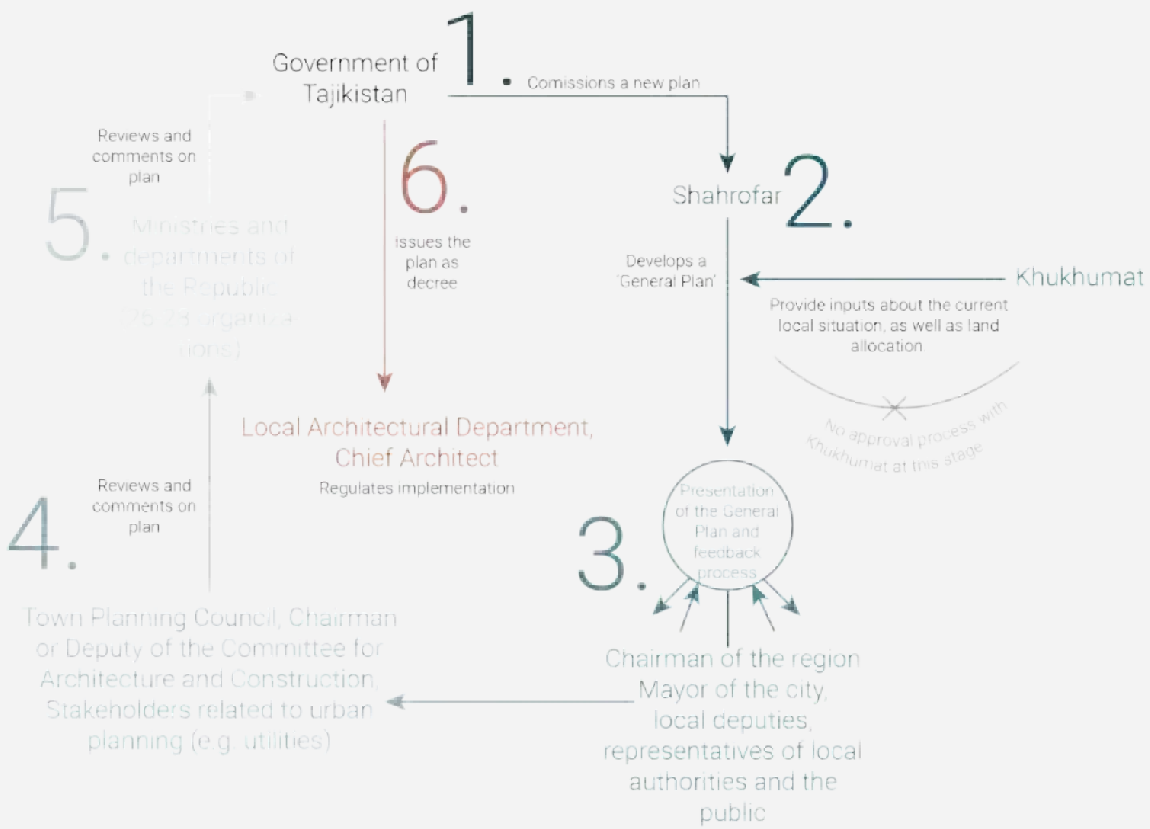


Fig 19. Summary of planning development and the validation process in Tajikistan

mostly suspended. Starting from 2001, the OJSC "Shahrofar" Design Institute (previously Giprostroy) resumed the process of updating and redeveloping master plans in Tajikistan that had become outdated or had expired. The organisation has been working in this capacity since Soviet rule and has a monopoly in this field of expertise. Initially producing one to two master plans per year, "Shahrofar" Design Institute has increased its capacity to up to ten master plans per year. As for now, it performs urban territorial planning functions for the entire country, districts, micro-districts, quarters and individual sites, including production of documentation such as general plans, detailed project planning, and district planning schemes. It is also responsible for the architectural design of residential buildings, engineering structures and reconstruction.

- On the sub-national level there are Khukumats that are responsible for providing information to the OJSC "Shahrofar" on their current settlement conditions and plans for future development in their respective territories. They are also responsible for the allocation of land for construction projects in accordance with the Land Code, they can provide their opinions during the process of general plan development in consultation forms. Payment for the services of OJSC "Shahrofar" Design Institute is provided either entirely from the budget of local Khukumats or, in the case of financially weak regions, in whole or in part from the state. Tajikistan holds a price index for the General Plan designs, which defines the main items of expenditure with indicated coefficients, and, in the future, the total cost also depends on the complexity of work;
- This further confirms the vertical restrictions that apply to the local governance rights in Khorog. Despite this, there are some examples of horizontal coordination between ministries and committees at the national level in issues of documentation approval and information provisioning. This highlights that there are both elements of vertical integration and devolution which will be further investigated in this legislative assessment.
- The Land Use Department is responsible for the general process of the Plan's approval and construction planning. Its local representative offices regulate land use in each region of the country.
- Communication between all abovementioned actors takes place through official request letters to obtain necessary data. For example,

designers of the OJSC "Shahrofar" design institute may apply to the Chairman of the Region or the Mayor with a request to provide the necessary data. In turn, local governments can send and receive clarifications within their powers.

- All urban planning activities are subject to state supervision, carried out by an authorized state body in the field of urban planning , . Placement, construction and commissioning of facilities without approved project documentation, without a positive expert opinion, without a decision of the local executive body of state power and without a document confirming the right to use the land, as well as violation of the rules for the construction of structures, performance of construction and installation work without the permission of state bodies construction control, shall be subject to liability under Article 409 of the Code on administrative offences . General rules on liability and compensation for harm in urban planning activities in the Republic of Tajikistan are enshrined in Chapter 13 of the Town Planning Code. According to general rule, compensation for harm is afforded by the person performing such work. Subsidiary liability in certain cases may be incurred by the organization responsible for examination of project documentation .

3.4.3. Land Regulations

Land is an essential means of livelihoods as a means of production and spatial organisation. Land that is maintained as a natural resource is an important component of the biosphere.

Land relations in countries of the USSR differ fundamentally from those of European countries. According to the 1977 Constitution of USSR, land, its subsoils, waters, and forests fell to the exclusive ownership of the state. The current Constitution of Tajikistan (Article 13) maintains this paradigm in accordance with which the land, its subsoil, water, air space, flora and fauna, and other natural resources constitute the exclusive property of the state, which guarantees their effective use in the interests of the people. In 1991, all post-Soviet countries found themselves in almost equal conditions but chose different avenues for market development. Tajikistan remained the only post-Soviet country, among few other countries in the world such as Cuba, the Republic of Congo, Venezuela and North Korea, wherein 100% of land is retained by the state.

Though the Republic of Tajikistan is considered a land-poor republic (93% of the country's territory is mountainous) , legal frameworks for land regulation are quite extensive. They encompass:

- The Constitution (1994);
- Land Code (1996);
- Law of the Republic of Tajikistan "On Amending the Land Code of the Republic of Tajikistan" (1999);
- Law of the Republic of Tajikistan "On Land Appraisal" (2001);
- Law of the Republic of Tajikistan "On the Land Reform" (1997);
- Law of the Republic of Tajikistan "On Dekhan Farms (Farming)" (2002);
- Law of the Republic of Tajikistan "On Personal Household Lands" (2003);
- Law of the Republic of Tajikistan "On Rent in the Republic of Tajikistan" (1990);
- Law of the Republic of Tajikistan "On Setting Coefficients of Indexation of Land Tax Rates" (1999);
- Law of the Republic of Tajikistan "On the Specially Protected Natural Territories" (2011);
- Law of the Republic of Tajikistan "On Land Payments" (1992);
- Law of the Republic of Tajikistan "On Subsoil" (1994);
- Law of the Republic of Tajikistan "On the State Regulation of Ensuring Fertility of Agricultural Lands" (2004);
- Law of the Republic of Tajikistan "On Soil Protection" (2009);
- Law of the Republic of Tajikistan "On Pastures" (2013);
- Law of the Republic of Tajikistan "On the State Registration of Real Estate and Rights Thereto" (2008) etc.

All the above-mentioned laws provide for regulation of issues related to land, with fundamental pertinence to land tenure. They refer to relationships between land and people, defining rules and practices that encapsulate conditions of access to, use of, control over and disposal of land. Article 3 of the Land Code defines the following categories of land:

1) Agricultural land;
2) Urban lands (cities, urban settlements and rural settlements);
3) Land for industry, transport, communications, defence and other purposes;
4) Land for nature conservation, health, recreational,

historical and cultural purposes;
5) Lands of the state forest fund;
6) Lands of the state water fund;
7) Lands of the state reserve.

Agricultural lands (Article 64 of the Land Code) include arable land, perennial plantations, fallow lands, hayfields and pastures, lands occupied by on-farm roads, communications, reservoirs, hydraulic structures and buildings used for production and storage. A total of approximately 16,000 hectares of land are suitable for agricultural cultivation in GBAO and total countrywide lands in use by agricultural enterprises amounts to 6,949,381 hectares (as of January 2017). Agricultural lands and Lands of Specially Protected Areas are not available to foreign citizens or foreign legal entities.

Urban lands (Article 76 of the Land Code) include all lands within the city's administrative boundaries.

Urban lands Fall under the jurisdiction of local city authorities and consist of:

- Residential land;
- Common land;
- Agricultural land;
- Lands occupied by gardens, forests and shrubs;
- Lands for industry, transport, communications, pipelines and other purposes;
- Land under water and reservoirs;
- City land reserves.

Public spaces are a constituent part of urban land. Such spaces enhance community cohesion, civic identity, and quality of life. They are also a first step toward civic empowerment and greater access to institutional and political inclusion. Properly designed public spaces not only contribute to the overall visual character of a city, but also stimulate economic activity and enhance urban productivity. The total area of urban lands in Tajikistan amounts to 170,367 hectares (as of January 2017).

Lands for industry (Article 81 of the Land Code) are provided to industrial enterprises, institutions and organizations for construction, industrial production, as well as for other economic and special needs.

Lands for transport (Article 84 of the Land Code) are provided for transport infrastructure and also include the maintenance, reconstruction, development and improvement of communication lines.

Lands for communication, radio and power transmission lines (Article 86 of the Land Code) include provisions to enterprises, institutions and organizations operating these lines, for the support of overhead communication lines, radio communication and power transmission, for buildings, structures and other devices – in accordance with technical designs and standards.

Land for defence needs (Article 87 of the Land Code) is reserved for the deployment and permanent operation of military units, military institutions, military educational institutions, enterprises and organizations of the Armed Forces of the Republic of Tajikistan, border and internal troops.

Land for nature conservation (Article 88 of the Land Code) includes the lands of reserves, national and dendrological parks, botanical gardens, reserves (except for hunting), and natural monuments.

Land for health (Article 89 of the Land Code) includes plots with natural healing factors (mineral springs, deposits of therapeutic mud, climatic and other conditions), favourable for the organization of prevention and treatment.

Land for recreational purposes (Article 90 of the Land Code) are intended and used for organized mass recreation and tourism.

Lands for historical and cultural purposes (Article 91) include the lands of historical and cultural reserves, memorial parks, burials, and archaeological sites.

Lands of the state forest fund (Article 92 of the Land Code) include lands covered with forest but extend to those without tree cover of use to the needs of forestry.

Lands of the State Water Fund (Article 95 of the Land Code) include lands occupied by reservoirs, glaciers, snowfields, marshes, hydraulic engineering and other water management structures, as well as lands allocated for right-of-way along the banks of reservoirs, main, inter-farm canals and collectors.

Lands of the state reserve (Article 99 of the Land Code) include all lands that are not provided for specific use and consist of a reserve fund for agricultural production, industry, transport and other national economic needs amounting to 2,857,706 hectares (as of January 2017). The lands of the state reserve fall under the jurisdiction of the local executive body of state power and are intended for lease, mainly for agricultural production.

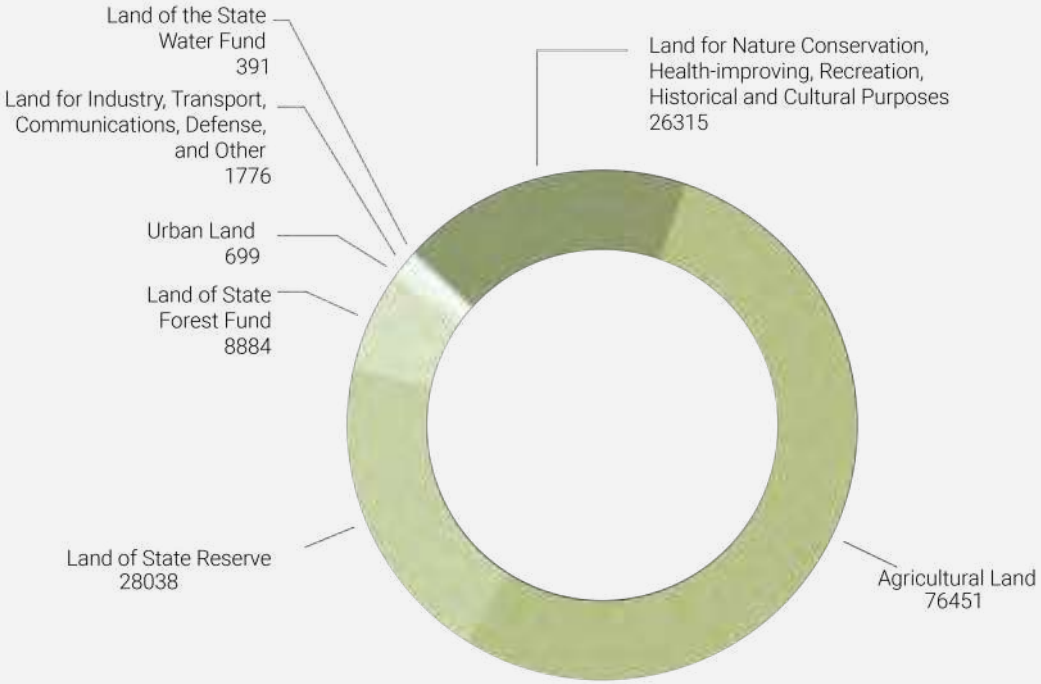


Fig 20. Land categorisation, by '000 hectares (data from 2014)

The Land Code includes several conditions for ownership, outlining the rights of primary and secondary land use. Primary land use rights include the following:

- Indefinite use of a land plot, without a predetermined period. The unlimited use of land plots is provided only to individuals and legal entities of the Republic of Tajikistan.
- Lifetime inheritable use – for individual citizens or collective farms, to establish a dekhkan (farm) economy and traditional folk crafts or to establish a household land plot. Land plots granted for the right to life-long inheritable use are subject to re-registration in the event of inheritance.
- Fixed-term use of land can be granted to legal entities or individuals by the state for a short-term period (up to 3 years) or a long-term period (3 – 20 years).

The only type of secondary land use outlined in the Land Code is the lease right. In accordance with the Code, owners of the primary use right can lease their plots for a period not exceeding 20 years.

Thus, the subjects of land relations in the provision and withdrawal of land are the state, individuals and legal entities. Individuals and legal entities also include foreign citizens and foreign legal entities (stateless persons are not mentioned in land legislation). Land plots are provided to foreign citizens and foreign legal entities for use for up to 50 years (not inclusive of agricultural or protected land). The State's control over land is represented by the central and local government body, which are imbued with the powers of ownership, use and disposal. Individuals and legal entities constitute users of land, without the right to dispose.

Land-use payment is levied annually in the form of land tax, rent within the established deadlines Land allocations by the local Land Use Department (e.g., for gardening, agriculture, construction projects) are tracked in a land information system. This registry remains in paper form under the supervision of the local Land Management Department, as electronic services are seldom utilised in the land sector. As a result, this data is not publicly accessible.

The provision of land forms the basis of land rights. In accordance with Article 8 of the Civil Code of the Republic of Tajikistan, civil rights and responsibilities arise:

a) from contracts and other transactions provided for by law, as well as contracts and other transactions not provided for by law, but not contradicting it;

b) from acts of state authorities and local authorities, which are provided by law as the basis for the emergence of civil rights and obligations;

c) from a court decision that establishes civil rights and obligations.

The process of land allocation itself includes two stages:

1) approval of an allotment for design and;
2) allocation of a land plot for construction.

The Government of the Republic of Tajikistan has unlimited powers in land allocation and withdrawal. In agreement with the local executive bodies of state power of districts, cities, regions and the authorized state body for regulating land relations, it provides for unlimited and fixed-term use, and lease of land plots from all categories and types of land, regardless of size (Article 261 of the Land Code of the Republic of Tajikistan). Local executive bodies of state power of regions, cities and districts, within their competence, provide land plots, and that which is not within their competence is carried out directly by the Government of the Republic of Tajikistan.

In accordance with Article 7 of the Land Code of the Republic of Tajikistan, the jurisdiction of local executive bodies of state power of the Gorno-Badakhshan Autonomous Region, regions, cities and districts within the administrative border in the field of regulation of land relations includes:

a) Oganization and implementation of land management, approval of land management documentation related to the performance of works of regional significance and on lands assigned to their jurisdiction, maintenance of the state land cadastre and land monitoring;

b) provision, withdrawal and consolidation of land for non-agricultural needs;

c) protection of the rights of land users and tenants;

d) termination of the right to use the land plot;

e) ensuring equal access for women and men to land plots;

f)the establishment of minimum rent for the use of a land plot, the establishment of public (compulsory) easements for land plots;

g)gratuitous or reimbursable provision of rights to use land plots with the right of alienation to individuals and legal entities of the Republic of Tajikistan in the manner established by the Government of the Republic of Tajikistan.

The powers of local executive bodies of state power in the field of allocation and withdrawal of land, as well as the powers of the Government of the Republic of Tajikistan, depend on the category and type of land in respect of which decisions on withdrawal and provision are made. At the same time, the local executive bodies of state power of districts and cities, in agreement with the local land management body, provide for indefinite, fixed-term and life-long inherited use, as well as for lease on land plots from the following categories:

a) agricultural land and state reserve lands for agricultural needs, regardless of the size of the land plot, and for non-agricultural needs in the amount of up to 10 hectares;

b) lands of the state forest fund and lands of the state water fund, with the exception of forest lands of the first category for agricultural needs, in the amount of up to 10 hectares, and for non-agricultural needs up to 5 hectares;

c) settlement lands (cities, towns and rural settlements) – up to 10 hectares;

d)and for industry, transport, communications, defence and other categories – up to 10 hectares;

e) lands of nature protection, health, recreational, historical and cultural purposes – in the amount of up to 5 hectares.

The provision of certain land categories for non-agricultural use are the exclusive purview of the National Government and include:

a) agricultural land and state reserves (arable land, perennial plantations, nurseries, hayfields and pastures);

b) settlement lands (national parks, parks of culture and recreation, botanical gardens and other types of gardens, natural monuments, recreational facilities, lands of historical and cultural significance, scientific research sites, research institutions - with the exception of light buildings - without changing the purpose);

c) land of the state forest fund and state water fund (arable land, land of perennial plantations, plantations, nurseries, hayfields, pastures and first category forests).

3.4.4. Property Regulations

The legislative and regulatory framework guiding property registration and tenure rights include the Constitution, Civil Code and Land Code. Registration law and associated legislation form the legislative basis for registration and includes the Law on State Registration of Immovable Property and Rights to It (2008). Other legal enactments relevant to the registration system include:

- Decree on State Registration Issues No 88 of 2013, which established the Specially Authorized State Body and the State Unitary Enterprise for Registration of Immovable Property (SUERIP)
- Instruction of Government No 447 of October 2013 on Systematic Registration
- Charter of State Unitary Enterprise for Registration of Immovable Property (SUERIP) adopted by the State Land Committee Dec 2014
- Order of Director of SUERIP of 25 Dec 2014, creating regional offices
- Practice Manual for Registration approved by State Land Committee July 2014
- Resolution on Implementation of Registration System in Seven Pilot Offices (draft prepared for Government to adopt, April 2015).

Whereas previously the Bureau of Technical Inventory (BTI) maintained an inventory of property records (but not legal rights) and the State Enterprise Markaz Zamin (MZ) managed the cadastre, the State Unitary Enterprise for Registration of Immovable Property (SUERIP) that was established in January 2015 unified these processes. SUERIP's single registration system for land and property creates the potential for more land tenure security. The government-led Land Registration and Cadastre System Project established a pilot site in Khorog to test the practical registration of rights to immoveable property.

Fig 21. Alley leading to the Isamili center, May 2021

3.4.5. Existing City Plans for Khorog

Independent assessments of the city commissioned by Shahrofar, were developed into a General Plan for Khorog that was completed in 2011. Documents were shared between local officials, however, no implementation or updates to the plan have been undertaken since. There is little evidence of existing construction in accordance with the Plan. The fast-changing conditions of Khorog resulting from a lack of buildable space and the high risk of natural disaster, may render the implementation of masterplans and the process of development more challenging there than in other areas of the country. The General Plan is shared between official government bodies but is not available to the public.

In 2010, the Aga Khan Trust for Culture (AKTC) developed a town planning initiative for Khorog in collaboration with Mcfarlane Green Biggar Architecture + Design, and Ibex In-Sites Community and Project Planning. This project aimed to provide a resource to initiate consultation with community groups, government and AKDN agencies. Outputs from this initiative included a Strategic City Plan and Proposed Zoning Structure in 2010, that were followed by a Masterplan in 2017. However, these initial documents were not built on a process of consultation and the document outcomes have not been widely shared with government bodies.

The AKTC town planning initiative recommends areas for densification, sites for public space creation, new AKDN and institutional spaces, housing growth strategies and recommended typologies, redevelopment of certain buildings, infrastructure improvements, pedestrian and bicycle connectivity improvements, and urban design improvements to public spaces with a focus on the river edge that would connect to a proposed extended park network. It suggests environmentally efficient infrastructure, possible economic sector growth, implementation strategies and next steps. This document also provides a suggested organisational structure for AKDN.

The AKTC Zoning Structure organizes land by type and purpose. However, all existing zoning regulations for the city are specified in the building codes and regulations of the Republic of Tajikistan and The Land Use Department is responsible for allocating land on a city and regional scale. This information is managed by the local Land Management Department and is not publicly available, resulting in a disconnection between this plan and official land management.

An AKTC Masterplan was completed in 2017, acknowledging and adapting to the changing city context. Work was done to align both the AKTC and government plans, however this was not completed and neither plan has been implemented.

The Masterplan includes area design studies for sites including:

Area A | Hospital Upland Improvements
Area B | River Edge Improvements
Area C | Lenin Street Improvements

The Masterplan also suggests design studies that focus on the two main areas of the town centre and the UCA development area, named the 'college town district'. These are updated in accordance with a new review of the city conditions and include:

Area D | UCA College Town District
Area E | Transportation System Management
Area F | Expanded Serena
Area G | Cultural District
Area H | Jamaat Khana South Hillside
Area I | Jamaat Khana Road
Area J | Airport
Area K | Tourism

These area design studies are diverse in their approach, providing urban design recommendations, recommendations for action, and new assessments or partnerships to be explored to trigger development in certain spatial areas or financial sectors.

In addition to masterplans, tools have been developed for the city of Khorog to facilitate a participatory development process. These form part of the Law of the Republic of Tajikistan on Appeals of Individuals and Legal Entities (Law 1339 of July 23, 2016), adopted by Resolutions 471 (of 09.06.2016) and 265 (of 15.07.2016), the Resolution of the Ministry of Education and Science, and the law "On Citizens Appeal", which was formed in response to the social unrest of 2012 and 2018.

The city authorities of Khorog launched an electronic office to receive online appeals from citizens, as well as a physical office where citizens may make in-person appeals to local officials. One of the first initiatives undertaken by the Governor after taking his position in 2018, was to conduct listening sessions with the communities across Khorog to explore the principal challenges faced. The listening sessions conducted in 2018 identified four principal challenges:

1) Access to safe habitats (in regard to natural hazards)

2) Improved access to resilient services;
3) Enhanced regional connectivity;
4) Meeting the needs of a changing demographic.

Notwithstanding these efforts, there is limited vertical integration of planning instruments and national, regional and local level strategies. There is also some disconnect between communities and government plans for the city, which is evidenced by the lack of provision for coordination and participation in these tools.

3.5. Municipal Finance

Local budgets are drafted and approved by the local council, which review budget execution reports. Local funds have an increasingly important role, due to the increased influence of local government bodies on social and economic development, along with the transition to a market economy and growth of diversified forms of ownership.

First-tier local governments, or Jamoats, do not have budgets. Instead, their financial resources are specified in a separate line of the region's budget. Local funds are created by own-source revenues that are allocated at their discretion. Such revenues could include:

- Legally established sources of revenues for different budget levels
- Allocations from centrally collected taxes and duties

Any budget surplus or additional revenues received after approval of the budget is used by administrations to finance the budget deficit, economic sectors or social programs and other expenses. After assessing all expenditures by the oblasts, cities and rayons, the Ministry of Finance calculates the total amount of local budget revenues and deductions from central taxes and fees. Allocations from the central budget are made on a monthly basis.

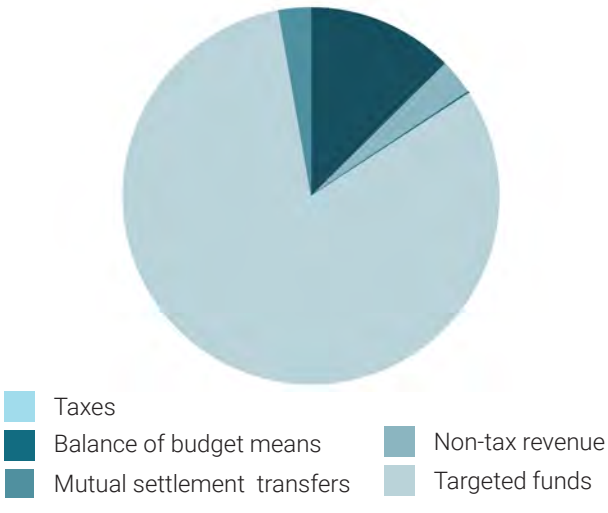
The Constitution entitles local councils to establish local taxes, set methods of tax collection and declare exemption or reduced rates for specific categories of taxpayers. In GBAO, primary sources of revenue are from both national funds and international humanitarian aid and development organisations.

The majority of local budget expenditures in GBAO are related to culture and society, particularly to education and healthcare. GBAO's expenditure in housing stock and public utilities, law enforcement and civil defence are also high.

According to the national constitution, local Khukumats are entitled to set tax requirements and exemptions per sector and group. Local budgets comprise one-third of all budget revenues. Local taxes all contribute to local budgets under the Law on Social Insurance. Additional financing mechanisms come from non-recurring fees such as penalties. In accordance with the 2000 Law on the State Budget, a certain amount of centralized tax gathered is dispersed between districts. This may be considered to undermine responsibility for local governments to manage local budgets and ensure budgetary and fiscal alignment. Furthermore, as the amount is discussed between oblast, city and rayon administrations, this dispersed budget allocation may vary by year.

Type of Revenue	Percentage of total budget revenue in GBAO
Taxes	12.6
Value-added tax	2.6
Income tax, profit tax and capital appreciation tax	6.6
Property tax	2.2
State duty	0.2
Other	1.0
Non-tax revenue	3.1
Balance of budget means	0.1
Targeted funds	81.4
Mutual settlement transfers	2.8
Total	100.0

Table. 4. Revenues in GBAO



Jamoat financing is officially considered within the regional budget, however, revenue for Jamoat budgets is considered to be self-funded. Out of the total 564,604 TJS budget for Khorog in 2020, provided by tax collection, I. Somoni received 267,922 TJS and S. Shokhtemur, 296,681TJS.

The highest local government tax contributions come from income tax and small business entities tax. The local government spending prioritization in October 2020 was organized as follows:

Type of Expenditure	Percentage of total budget revenue in GBAO
Economy	12.9
Agriculture	1.0
Transport	-
Housing stock and public utilities	11.6
Other expenses	0.3
Culture and society	55.0
Education	33.8
Culture	3.6
Healthcare	17.0
Sports	0.2
Social security	0.4
Law enforcement and civil defence	14.2
General administration	9.9
Compensation for employees	2.5
Other expenses	5.5
Total	100.0

Table. 5. Expenditures in GBAO

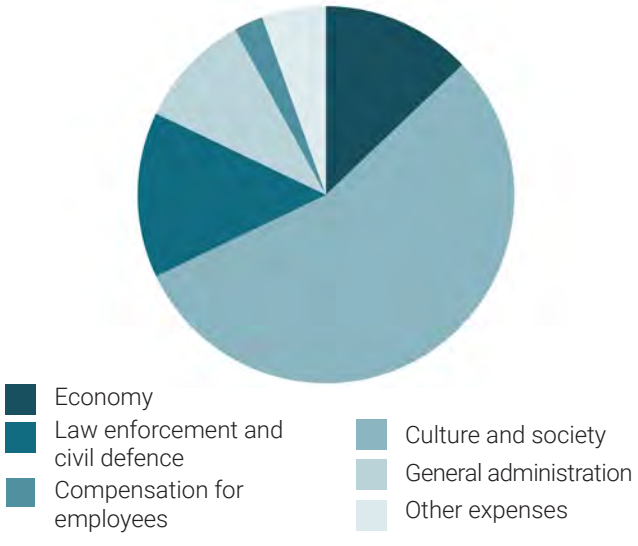


Fig 22. Expenditures in GBAO as percentages

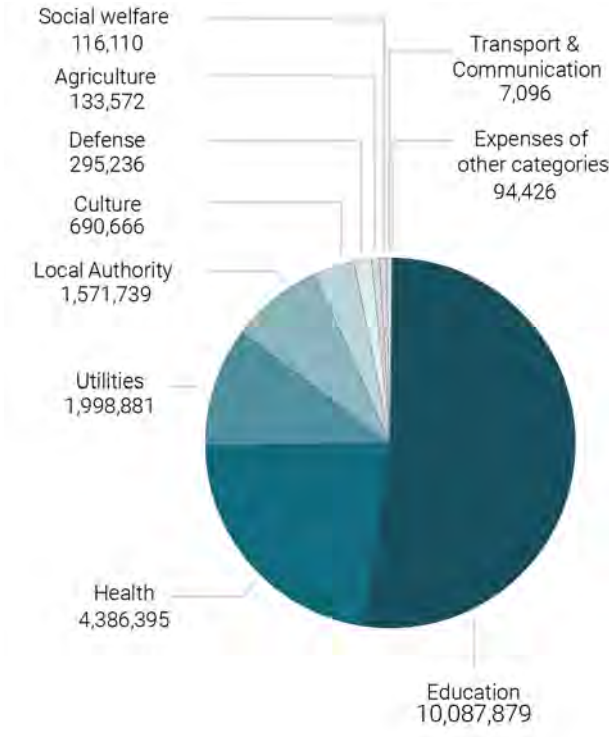


Fig 23. Revenues in GBAO as percentages

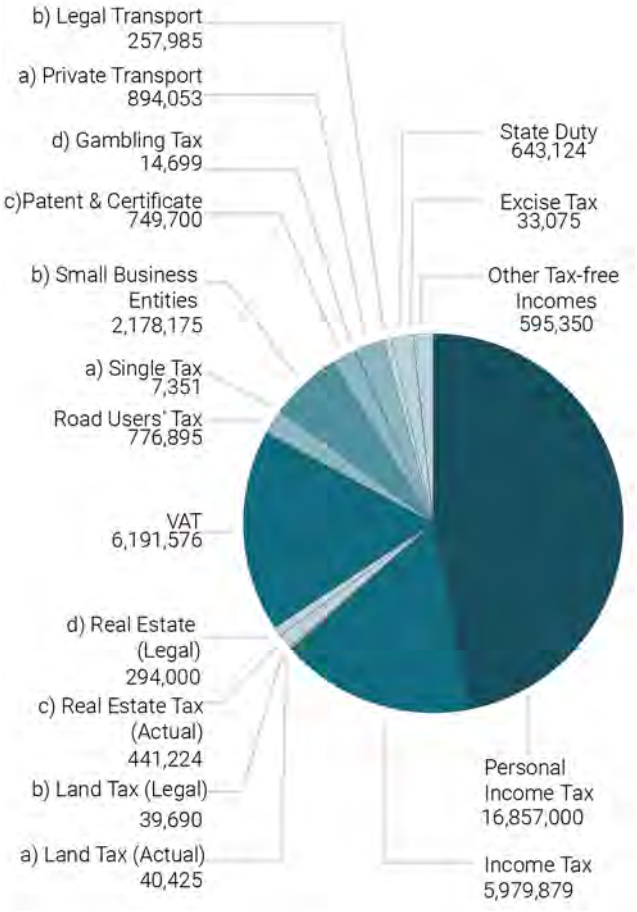


Fig 24. Revenues in GBAO as percentages

? Additional questions for Chapter 3: Institutional Resilience:

How does the mayor and Khukumat function in tandem? How do they overlap, and work together?

Masterplans on a regional scale – what are the development strategies on this scale?

What is the definition of masterplans for the country?

How much are targeted funds tax revenues from Khorog? How much of GBAO's expenditure goes to Khorog?

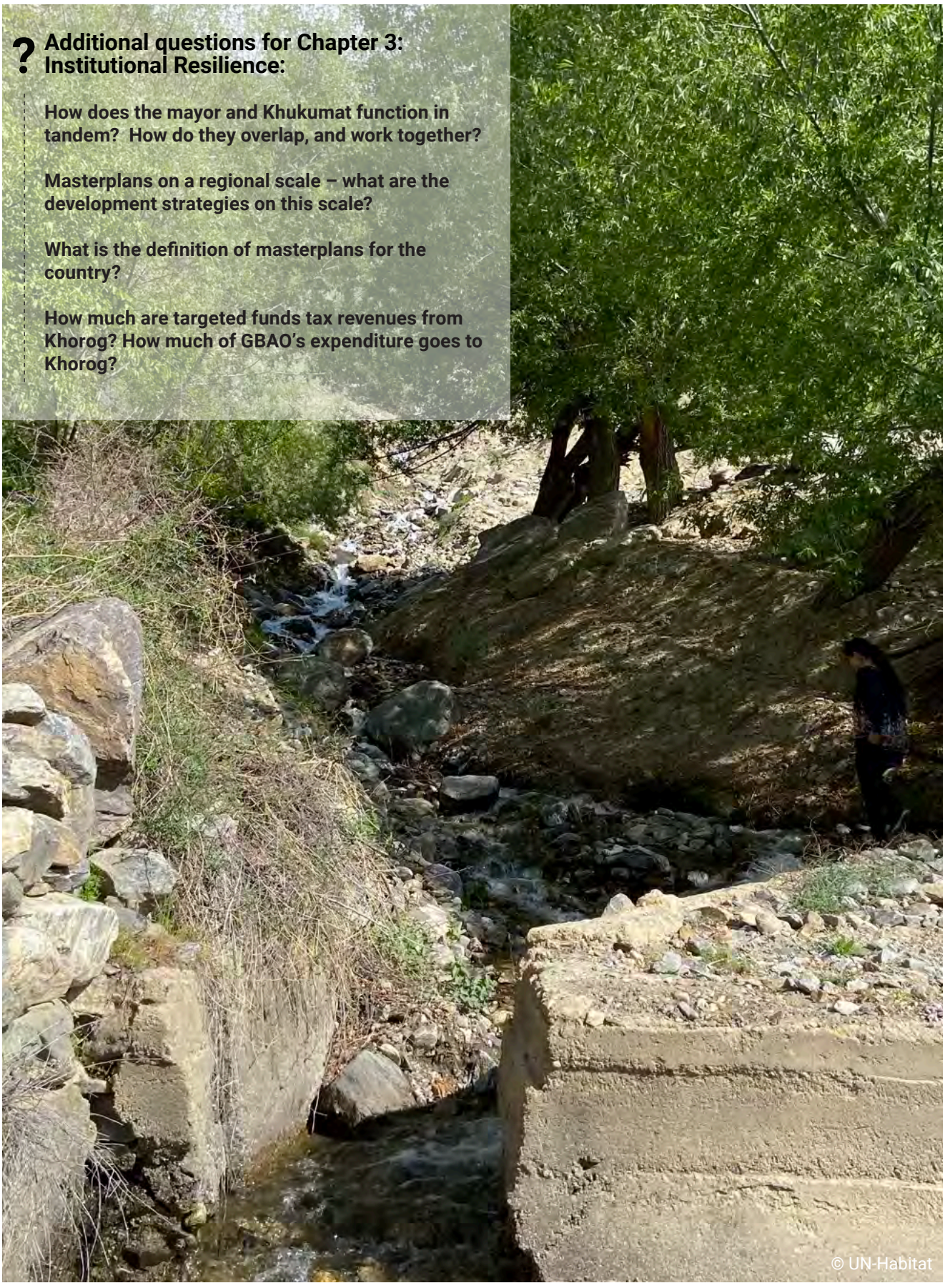


Fig 25. A spring in Nivodak, May 2021

Fig 26. Slope area in Imomobod, May 2021

4

SOCIO-ECONOMIC RESILIENCE

4.1. SOCIETY

Tajikistan's population is estimated at 9.3 million inhabitants, constituting an increase over recent years. Between 2000 and 2014 the country's population grew by approximately 34% with annual growth rates of over 2%, peaking in 2011/2012 at approximately 2.3%[02].

Dushanbe has a population of just over 860,000 inhabitants[03]. It has the country's highest population density alongside the regions of Khatlon, Sughd and the Towns and Districts of Republican Subordination (TDRS). Tajikistan's population density reflects the country's topography. Approximately eight million of the country's nine million residents (ca. 1.6 million households) are located in the Vakhsh and Kofarnikhon valleys, the Ferghana Valley in the north, and the Zeraefshan and Badakhshan valleys in the central east.[04] Of all regions, GBAO's population is the lowest, constituting 2.4% of the total population at 228,900 people. The table below describes the country's area, population distribution and density per region.[05]

Despite an increasing population and in contrast with the international urbanization trend, the majority (approximately 73%) of the Tajik population remains in rural areas.[06] Most cities in the country have less than 50,000 inhabitants, and Tajikistan's urbanization level remains low, reaching only 26.7% in 2014, compared to the ECA's average of 70.5%.[07] Between 2000 and 2014 Tajikistan's urbanization level increased by only 0.2 %.[08]

Tajikistan's ethnic structure constitutes 85% Tajiks, with other major ethnic groups being Uzbek, Kyrgyz, Russian and Turkmen[09].

The country's population is young, with 50% of the Tajik society younger than 25 years, 29.2% aged 15 or under, and only 3.3% above 65.[10]The average Tajik household consists of 6.3 members, with an average of 3.8 births per woman.[11] A quarter of Tajik families have eight or more members, while just 7% are limited to one or two members. The households size also varies depending on the living environment. In rural areas, families tend to be larger (6.9 members), and are smaller in urban settlements (4.9 members).[12]

In comparison with Hungary and Belarus, two countries that have the most comparable population size, Tajikistan has larger net migration and birth rate. It has a much lower median age and urban population.

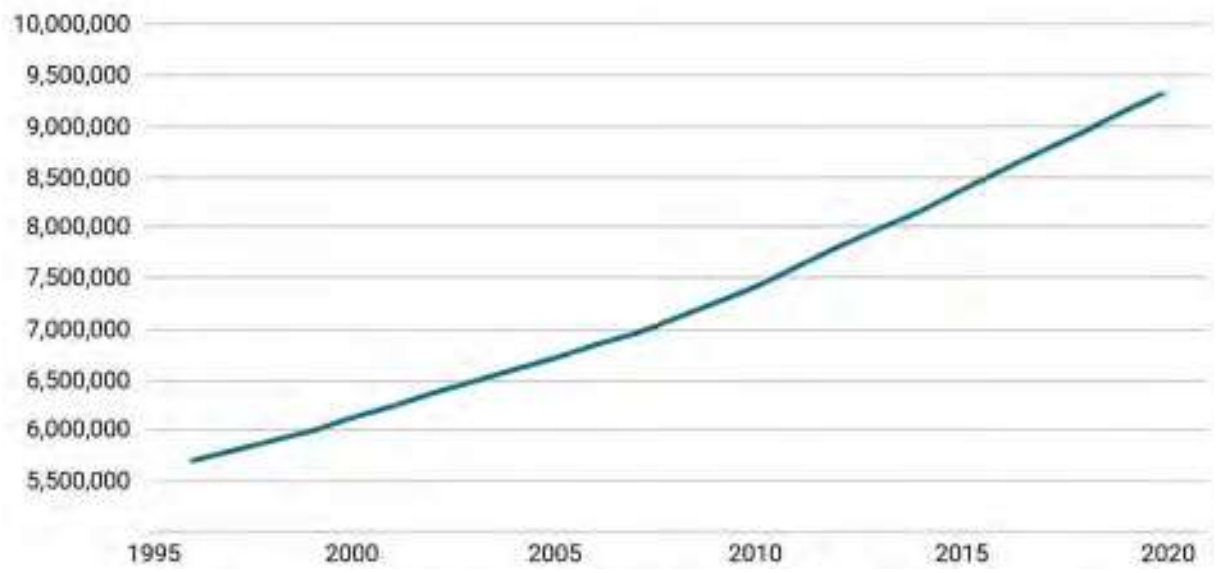


Fig 27. Population numbers in Tajikistan from 1996 to 2020

Area	Territory (km2)	Percentage of total area	Resident popu-lation	Percentage of total popula-tion	People/km2
Tajikistan	141,400	100.0	9,313,800	100	65.9
GBAO	62,900	44.5	228,900	2.4	3.6
Sughd	25,200	17.8	2,707,300	29.1	107.4
Khatlon	24,700	17.5	3,348,300	35.9	135.6
Dushanbe	100	0.1	863,400	9.3	8634.0
Towns and Districts of Republican Subordination	28,500	20.1	2,165,900	23.3	76.0
Total	28,500	20.1	2,165,900	23.3	76.0

Table. 6. Area, Population and Density of Oblasts within Tajikistan

Country (or de-pendency)	Population (2020)	Density (P/Km²)	Land Area (Km²)	Migrants (net)	Fert. Rate	Med. Age	Urban Pop %
Hungary	9,660,351	107	90,530	6,000	1.5	43	72%
Tajikistan	9,537,645	68	139,960	-20,000	3.6	22	27%
Belarus	9,449,323	47	202,910	8,730	1.7	40	79%

Table. 7. Country context; population and social comparison[13]

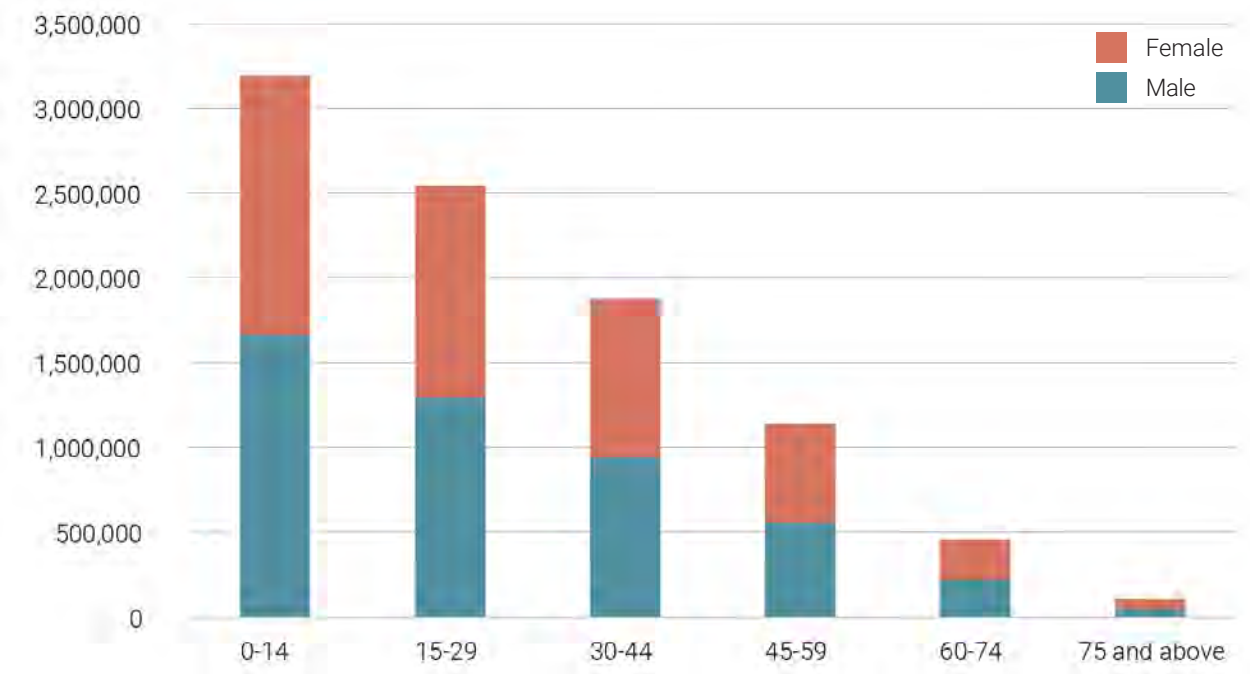


Fig 28. : Breakdown of Tajikistan population by age and gender

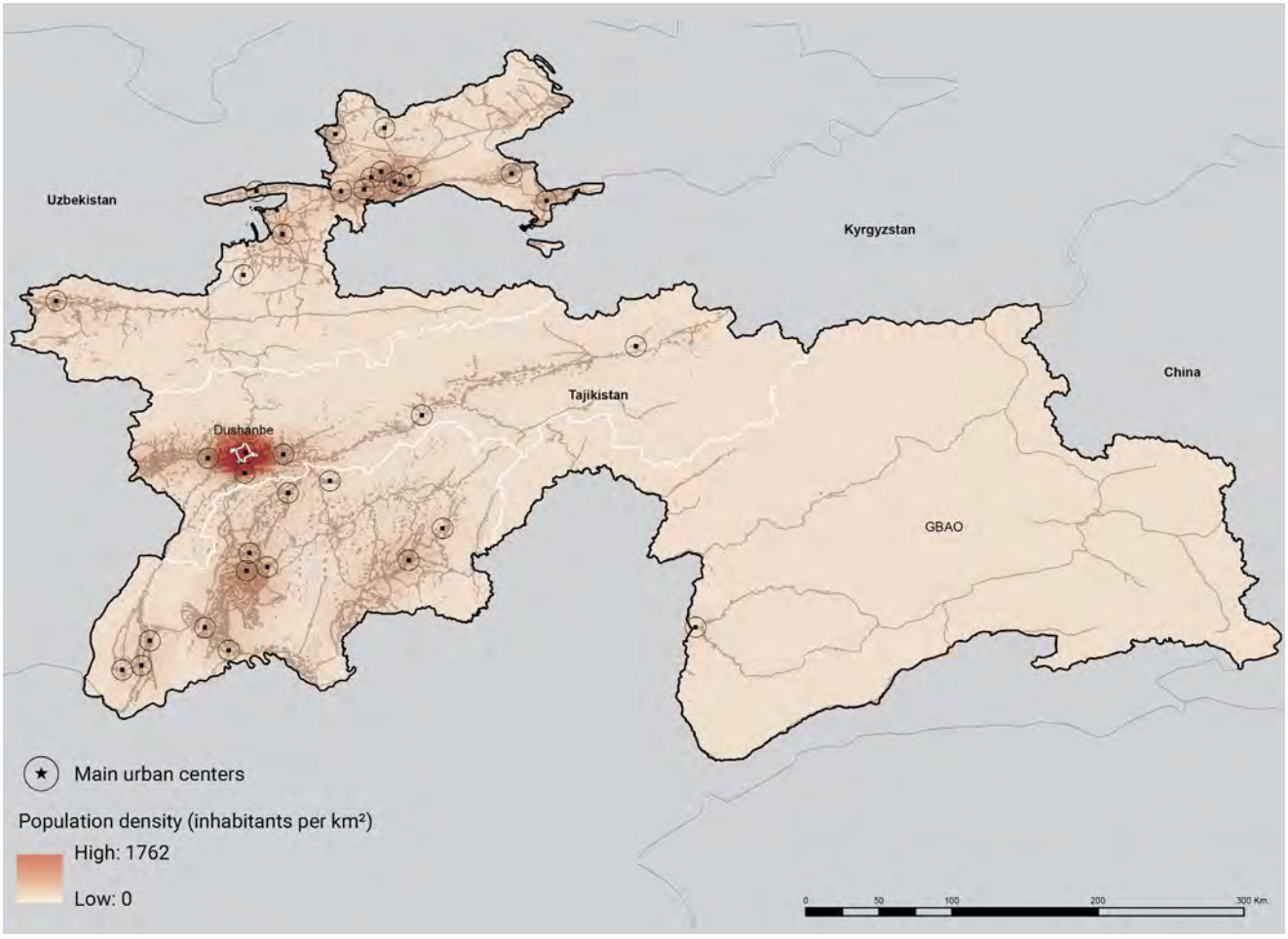


Fig 29. Density and distribution across Tajikistan:

4.1.1. Regional Demographic Structure

Population growth rates in GBAO are slightly lower than other regions in Tajikistan and the country as a whole; in 2020, the region grew 0.9%, while the country grew 2.05%. Between 2004 and 2010, population growth was negative, reducing from 209,500 in 2004 to 204,800. After 2010, GBAO's population grew steadily, reaching a total of 228,900 in 2020. [14]

The population density of GBAO is approximately 3.6 people/km^2 and is distributed extremely heterogeneously according to topography. [15] When density is further broken down by district, Murgab district is least dense with 0.4 people/km^2, while Ishkashim district is most dense with 8.9 people/km^2. The majority of land in GBAO is not suitable for living due to the presence of high mountain ranges in the south and west . The table below highlights the population distribution by district as of July 20, 2020.[16]

The population of GBAO is 51.3% male and 48.6% female. Approximately 61.8% (141,500) of the population is within working age, of which 32.8% are male (75,200) and 28.9% are female (66,300). Figure 29 provides a breakdown of the population by age, revealing a larger male population up to the age of 45. Beyond the age of 45, females are higher in number.

The region faces fragility risks due to its proximity to unstable parts of Afghanistan, large youth populations and legacies of violent conflicts such as the civil war that led to significant suffering.[17] GBAO recently witnessed the reoccurrence of clashes between local non-state actors and the central government.[18] Unlike other regions of Tajikistan, the Pamiri population constitutes the majority of GBAO's residents.

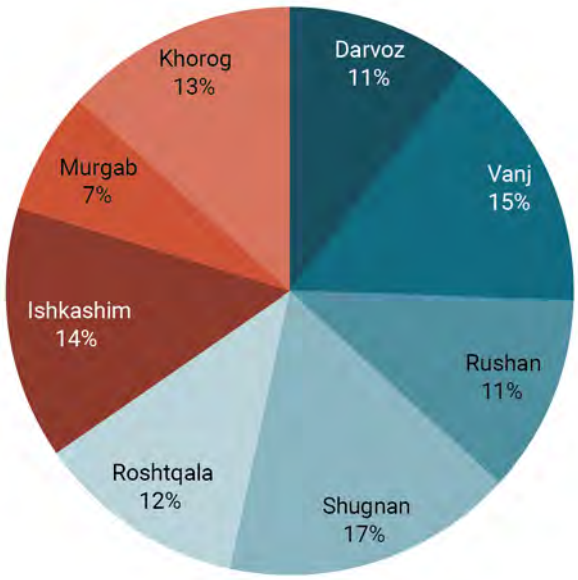
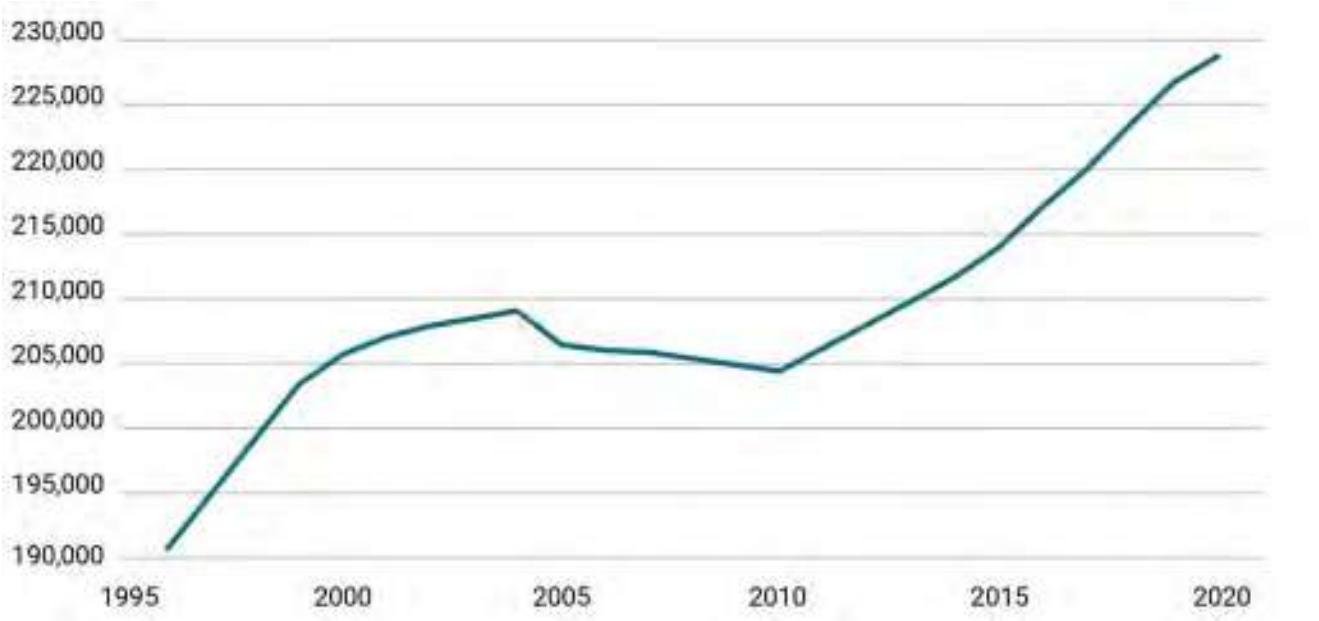


Fig 30. Percentange of the region's population by city

District/City	Population	People/km^2
Darvoz	24,000	8.6
Vanj	34,400	7.8
Rushan	25,800	4.4
Shugnan	38,000	8.3
Roshtqala	27,400	6.4
Ishkashim	32,900	8.9
Murgab	15,900	0.4
Khorog	30,500	7.1
GBAO	228,900	3.6

Table. 8. Population by city and density



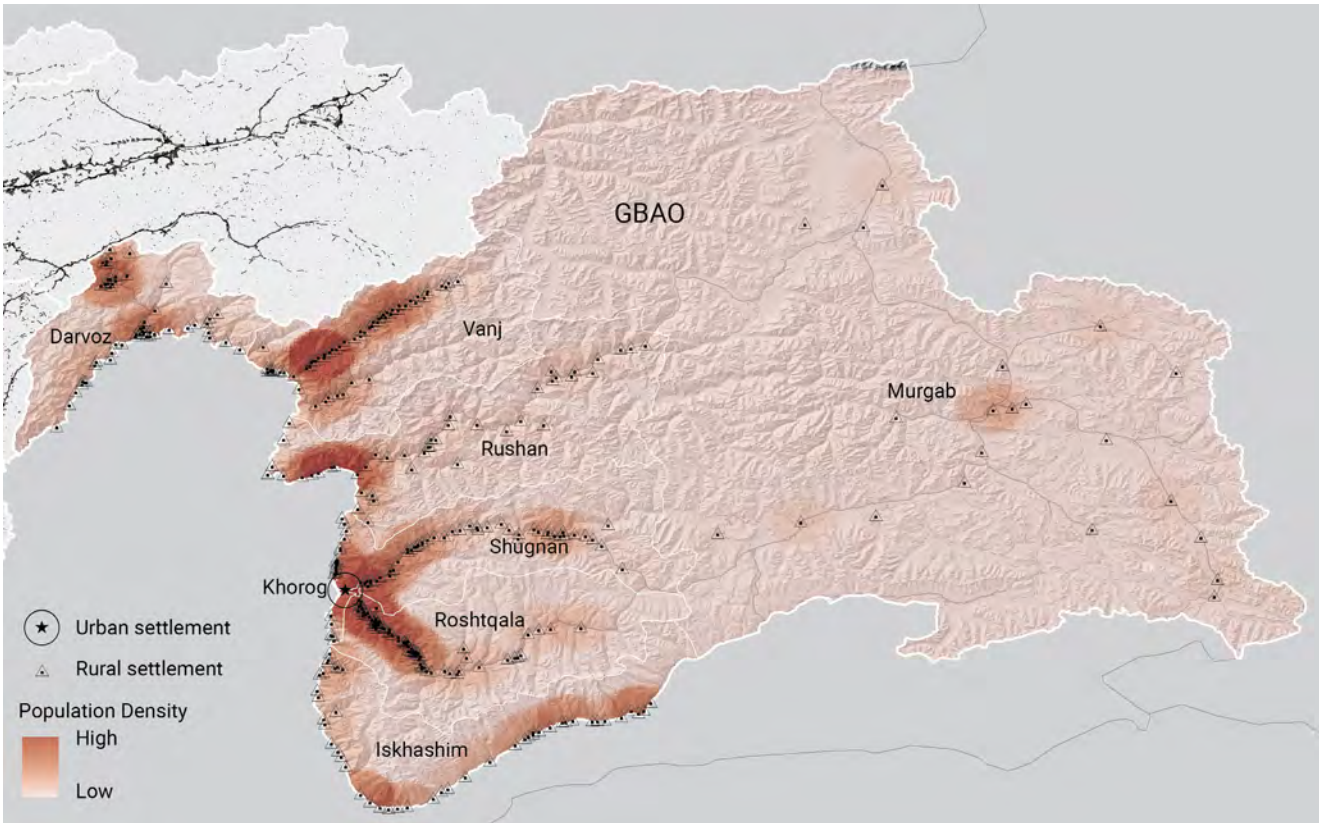


Fig 31. Spatialized population density

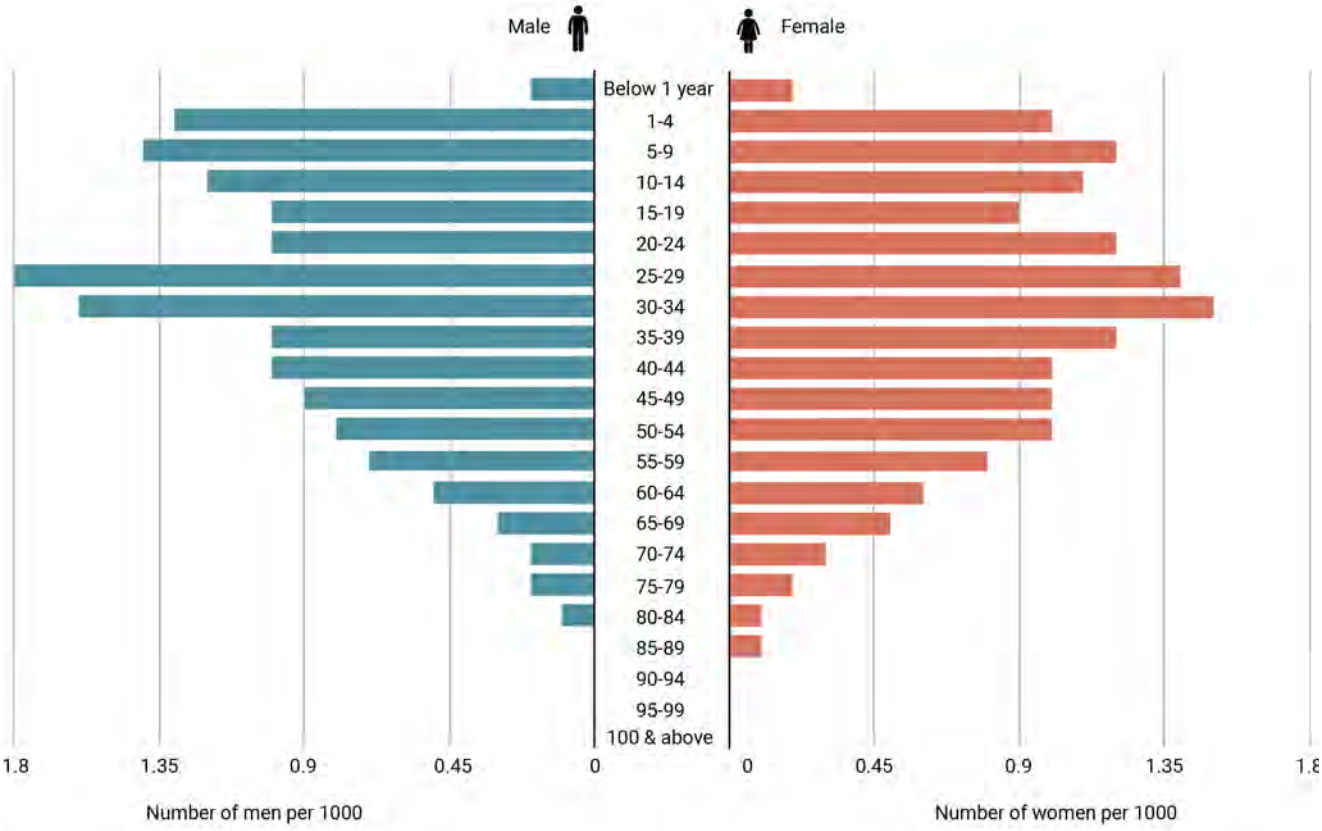


Fig 32. Population pyramid for male and female population of urban settlements in GBAO (per 1000)

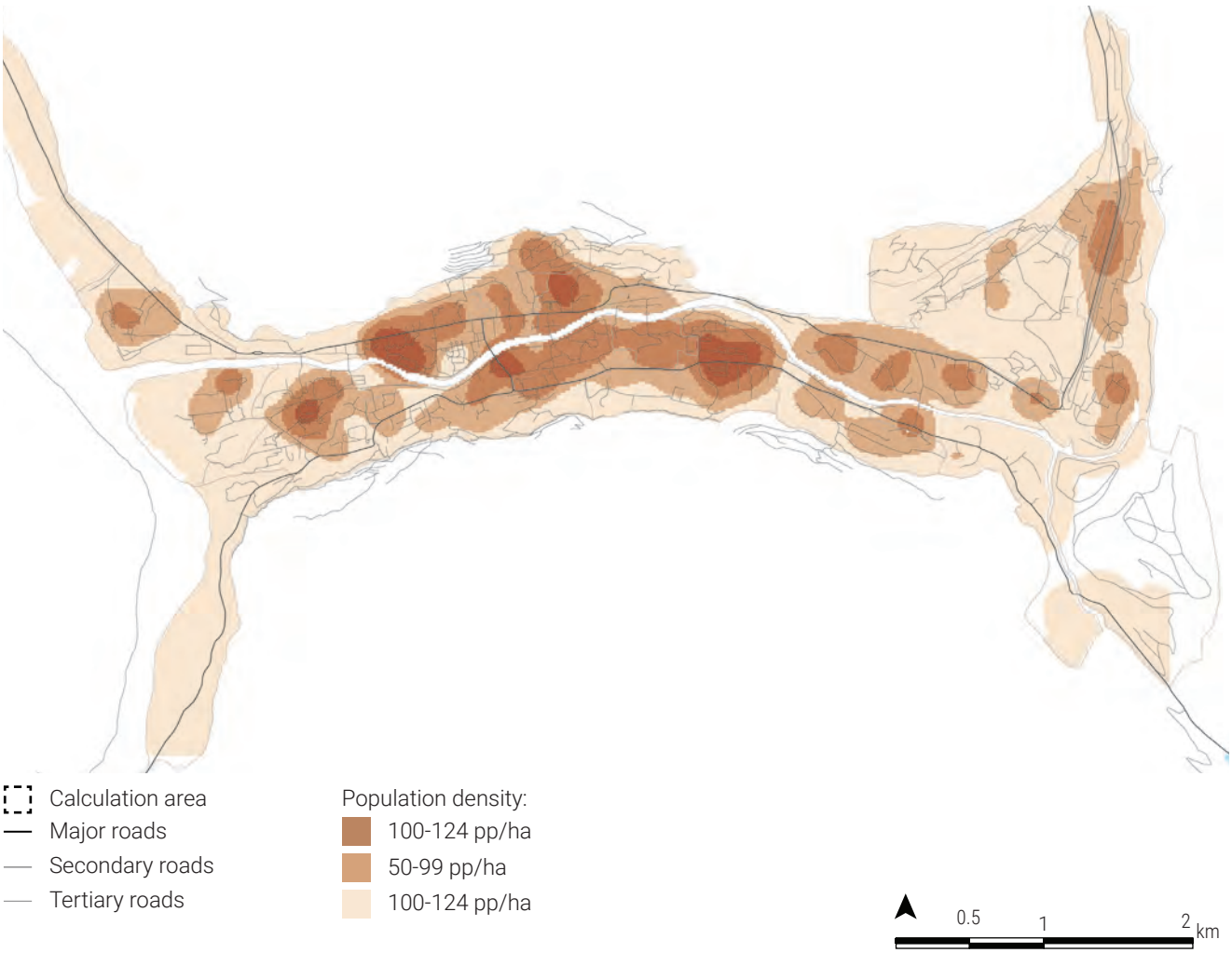


Fig 33. Density analysis of Khorog

The livelihood of GBAO's residents depends on water, arable land, pastures, forests and wild animals; most people make their living from subsistence farming and livestock breeding. The majority of Tajiks continue to live in large extended families and in GBAO, the average household size is 7.0 people.[19]

4.1.2. Local Demographic Structure

Khorog has a population of approximately 30,500. Out of 24 cities in Tajikistan, Khorog ranks 11th in terms of population, the highest ranking being the national Capital, Dushanbe. 13.3% of the GBAO population lives in the regional centre of Khorog city. The city's general population growth rate is unknown, however, the population increased by 0.6% between 2019 and 2020.

The number of ethnicities in the GBAO region, urbanization and cross-border migration patterns characterize Khorog as a socially and culturally diverse city. This is evidenced in the number of languages spoken within Khorog that include Tajik, Shugnan, Rushan, Vakhan, Yazguliam, Russian and Kyrgyz. In addition to this, a growing Chinese influence has been triggered by road infrastructure projects and is evidenced by the planned Chinese Embassy (not yet built). There are a number of migrants from Afghanistan and a Consulate for Afghanistan in Khorog.

As in the case of the country as a whole, there is a large youth demographic in Khorog (54 %). The World Bank refers to a "youth bulge" in the city, which calls for human capital investments, to provide educational and employment opportunities.

The population density of Khorog is spread around the city centre. The highest density areas offer the highest diversity of land uses, within a cluster of schools, commercial and institutional uses, including a large market space. Low density areas in three specific neighbourhoods correlate with low density occupation of the Botanical Gardens on the South-eastern corner, the UCA development of predominantly open fields, and the airfield on the North-western edge of the city.

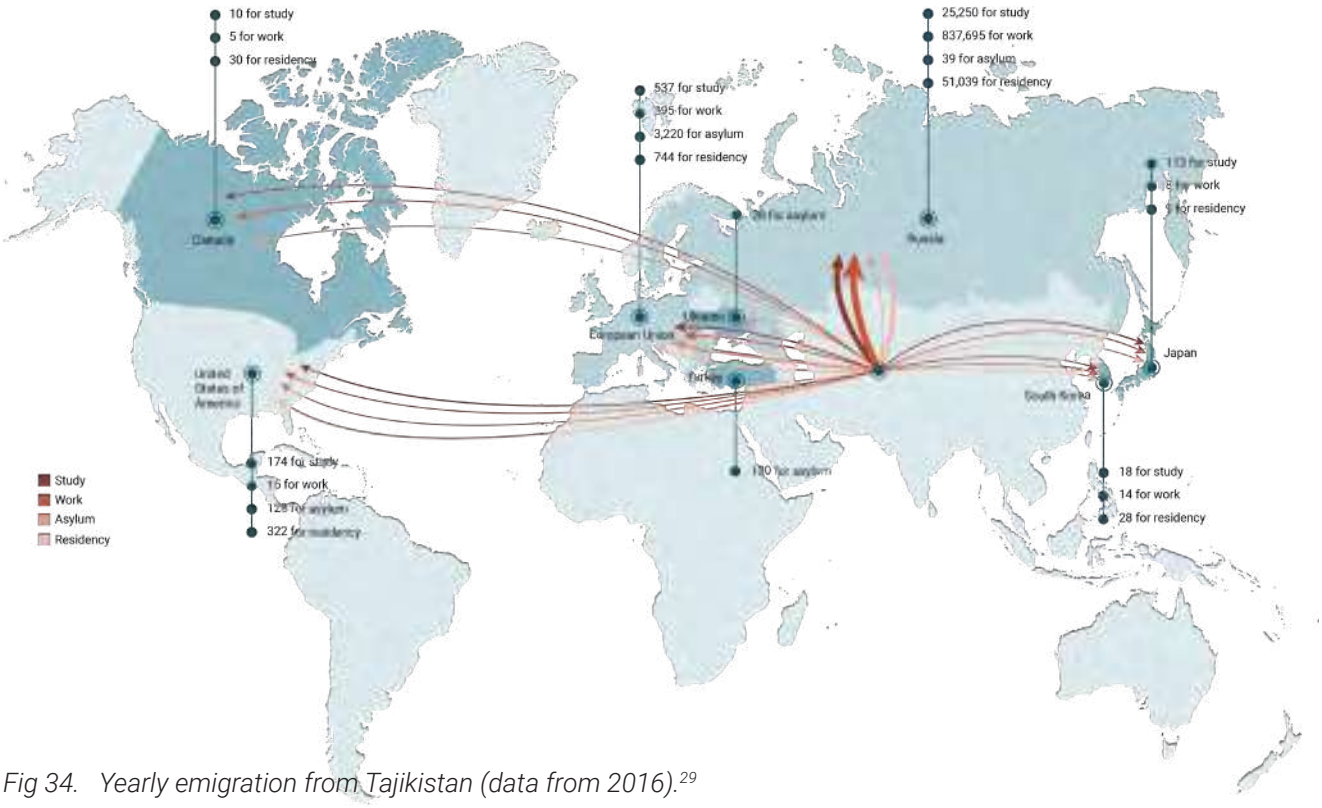


Fig 34. Yearly emigration from Tajikistan (data from 2016).[29]

4.1.3. Migration, Remittance and Refuge

Tajikistan has a complicated socio-economic situation characterised by poverty, unemployment, under-developed economic sectors, and high ratios of remittance inflows caused by the outflow of the labour force abroad, meaning that emigration plays a significant role in Tajikistan's national economy. In 2018, financial remittances accounted for up to 29% of Tajikistan's GDP, but can account for up to 50% in one year. Emigrating in search of work is a widespread household survival strategy, resulting from the prevalence of unemployment and low wages. A survey by the International Labour Organisation (ILO) found that for 62% of households, remittances account for more than half of their income.[20]

Emigration is becoming an increasingly gender-sensitive phenomenon in Tajikistan as men comprise the most significant number of migrants. However, the number of women leaving the country to seek employment abroad increased-from 11.8% of all emigration in 2010 to 15.8% in 2015.[21] The socio-economic impact of this trend requires careful observation, as though it can facilitate the empowerment of women, it could also result in ageing family members or children being left behind.

Tajikistan's migration context is pertinent to the understanding of vulnerabilities faced by the country in terms of both internal economic function and resilience

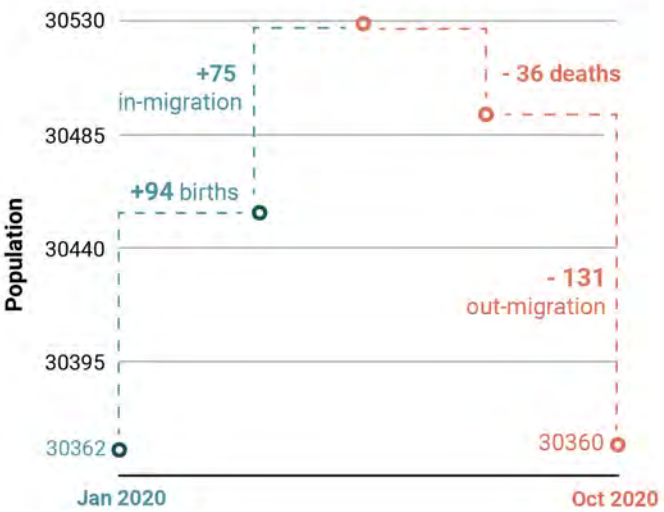


Fig 35. Population shifts in Khorog between January and October 2020

to external economic forces. Emigration patterns relate predominantly to working-age men who find employment in neighbouring states, principally Russia. The 2018 World Bank Country Diagnostic Report suggests that between 600,000 and 1 million individuals emigrate each year.[22]

While the majority of national migration relates to emigration, Tajikistan also provides a safe haven for

regional refugees. According to UNHCR statistics from 2020, Tajikistan hosted 3,791 refugees, 1,413 asylum-seekers and 7,151 stateless individuals. Newcomers and refuge seekers come mainly from neighbouring countries like the Russian Federation, the Kyrgyz Republic, Afghanistan, Uzbekistan, Ukraine, the Islamic Republic of Iran, Moldova, Kazakhstan, Turkey, and Belarus.[23]

There is a category of environmental migrants who live in environmentally hazardous areas and are subject to planned resettlement in order to prevent loss of life from natural disasters. The relocation of farms from ecologically dangerous zones are premised on a real threat to the life in territories prone to landslides, avalanches, mudflows, and other natural disasters. During the period from 2000 to 2015, a total of 8,293 families constituting more than 50,000 people were relocated from environmentally hazardous zones to safe places of residence on the territory of the Republic of Tajikistan[24].

During the rise of the Soviet Union, migrants were encouraged to move and settle in Khorog. Khorog also played a role as a refuge during the civil war in Tajikistan from 1992 to 1997, however, its population has remained relatively stable due to limited habitable and arable land.

The population numbers in Khorog between 2019 and 2020 show relatively stable population growth, however, the city is expected to grow exponentially in the future. Driving forces for the city's population growth include the above-mentioned environmental migrants from other areas in the GBAO, coupled with the provision of new health and education facilities in the city. In addition, degrading habitats in rural areas, returning economic migrants, and rural to urban migration is expected drive the growth of a high youth demographic in Khorog.

Although labour emigration varies by year, figures rose and peaked in 2016 and 2017, and have since dropped again. However, labour emigration from Khorog still accounts for a large portion of the working age group.

Khorog's border with Afghanistan gives it a strategic geographical appeal that also provides residents with the possibility of more regular movement for economic purposes. It is located in close proximity to three border crossing points with Afghanistan, at Tem, Ishkashim and Darvoz. In 2012, approximately 2,000 Tajik individuals regularly crossed the border at these points to work. A large proportion of these were NGO workers (mainly AKDN and AKF's health services) and engineers from Tajikistan that regularly work in Afghanistan. The two universities located in Khorog, as well as the social programs and funding for education has increased the migration of a young, student population into the city, and encouraged regular movement patterns across the border.

Notwithstanding movement across the border, migration is controlled to some extent by visa processing. This impacts demographics and migration for both residents of GBAO and Dushanbe and for Afghan and Chinese migrants into GBAO. However, an improved visa program with China has allowed for additional commercial and trade opportunities, aiding the economic growth provided by transit from China through the GBAO.

The UNDP's Border Management Program for Central Asia (the BOMCA) supported the construction of a market at Iskhashim Bridge to encourage trade and border management posts at Tem and Darvoz. These border crossing points have been closed between March 2020 and 2021 due to the COVID-19 pandemic. Electricity exports have also improved trade and economic opportunity between Tajikistan and Afghanistan. Khorog's proximity to points of exchange at the border with Afghanistan has had a significant impact on the social structure of the city. Illegal border crossings and trade across the border indicate the need for strong management and border control.

Permanent emigration for employment purposes also impacts the existing community in Khorog. Long-term emigration may have impacts on gender roles and responsibilities at the household level.[25] Unmanaged population influxes and seasonal population shifts may lead to pressures on resources, basic services and housing supply and could threaten to create social upheaval.

2014			2015			2016			2017			2018			2019		
Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F
1787	1164	623	2130	1390	740	2530	1480	1050	2584	1584	1000	2257	1269	988	2105	1285	820

Table. 9. The total number of labour emigrants from Khorog between 2014 to 2019

4.1.4. Inclusion and Equitable Access

Social, spatial, religious, political and cultural factors may all impede on social inclusion and cohesion in Khorog. For example, gender roles in Khorog are impacted by economic migration and by male, working-age demographic shifts, traditional women's roles and limitations to financial independence, employment, education and housing ownership. Poverty may be somewhat countered by male economic emigration but opportunities for women to overcome poverty are even more limited.[26]

The biggest challenges to gender equality and women's empowerment on a national level include:

- lack of educational opportunities for young women and girls;
- equal access to economic resources for rural women;
- limited women's participation in governance; and,
- weak protections against gender-based violence (GBV).[27]

Sense of inclusion may be impacted by the diversity in local ethnicities, cultures, languages and religions within the GBAO, that may differ to that of local and national authority representatives, languages and religions. Not only does AKDN and the development projects it has undertaken impact the social dynamics of the city, but also it provides religious and community centres connecting Ismaili's in Khorog to the wider international Ismaili community.

Major limitations to land rights are present for women, people with disabilities (PWD), those with little to no education, single elderly people, and Turkmens, Kyrgyz and Luli groups. This is more dominant in rural areas, however, in urban areas difficulties present in the form of language barrier, costs of registration processes, low levels of awareness of the process and/or benefit and potential taxes once registered. Houses are retained within families, there is no formal market for land use rights and some informal housing exists as a result. It is customary for the youngest son of the family unit to care for his parents and to inherit the property. Disputes of inheritance are usually moderated by religious leaders. Male descendants are usually favoured in accordance with sharia law.[28]

In 2012, urban planning norms and rules (GNIP) for "Accessibility of buildings and structures for people with limited mobility" were issued. These regulate provisions for general access to public and administrative buildings, using ramps, elevators, special toilets, etc.

In addition, targeted efforts have increased education among women, including on property laws and rights. There has been an increase in employment for women in positions of government. The main projects and activities associated with women's empowerment include:

- Empowerment in Agriculture and Tourism (e.g., to drive tractors, use machines/technologies)
- Increased health services for women
- Training: Health Education to help families and neighbours
- Women's resource centre (domestic violence; legal & psychological help)

4.1.5. Legislative Context of Inclusion and Equitable Access

The legislation of the Republic of Tajikistan defines requirements for authorities and organizations, regardless of the organizational and legal form, to create conditions of equal access for disabled people.[30] Article 25 of the Law of Tajikistan "On Social Protection of Persons with Disabilities", entered into force in January 2011 and provides that the authorities must "create conditions for Persons with Disabilities for unimpeded access to social infrastructure facilities (residential, public and industrial buildings, sports facilities, places of rest, cultural, educational and other facilities and institutions), as well as for the unimpeded use of rail, air, intercity road transport and all types of urban and suburban passenger transport, communication and information".[31] The law prohibits the construction of any new buildings or services that do not account for accessibility and stipulates that the owners of buildings and transportation services are responsible for covering the costs necessary to ensure accessibility.[32]

Based on this Law, Governmental Decree No. 834 was adopted "On the establishment of the National Coordination Council on Healthcare and Social Protection of the Population", dated December 31, 2014. It enshrines social protections for all categories of population.

During the preparation for accession to the UN Convention on the Rights of Persons with Disabilities, based on the principles of their full and effective involvement in society, equality of opportunities and accessibility for them without a barrier environment, State bodies of the Republic of Tajikistan developed and approved a joint action plan of the Committee for Architecture and Construction with the Republican

Society of Disabled People to address issues related to the accessibility of buildings and structures for people with limited mobility. Joint inspections and raids are carried out at construction sites to ensure that requirements of construction projects are met to protect people with limited mobility, as well as carrying out seminars and trainings.[33] Further urban planning regulations entitled "Accessibility of buildings and adaptation for groups of people with reduced mobility" were adopted in 2014, and the Town Planning Code was amended in July 2017 to include provisions for persons with disabilities to have unhindered access to social and other facilities. Article 64 of the Town Planning Code provides that a government committee must review all social, transportation or recreational construction projects to ensure access for people with disabilities.[34]

As of the present moment, conditions have not been fully ensured in the settlements of the Republic of Tajikistan for the unimpeded access of disabled people and other low-mobility groups of the population to social infrastructure, public and industrial buildings and structures. Gorno-Badakhshan Autonomous Region occupies 45% of the total area of Tajikistan and only 3% of it is suitably accessible for the entire population.[35]

4.1.6. Housing

The process by which land is acquired for residential construction in Khorog is initiated through the Land Use Committee, which is responsible for land planning in each region, and the regional level Architects offices, which are responsible for issuing construction permits for civil construction works, individual residential building construction, and architectural and planning assignments.

To begin construction, individual owners must obtain a land use certificate for the plot of land and permission for construction from the Architect's office. The Chief Architect of the specific regional Architecture Department in Khorog will usually check compliance with the city masterplan before providing a building permit. The body responsible for the city masterplan must also approve the construction design. When construction begins, both Chief Architect and the Land Use Committee representative must be present on site.

Within three days from the date of permit issuance to begin construction work, local authorities of architecture and urban planning send a copy of the permit to the authorized body of state construction supervision. The permit is issued for a specific object indicating the duration of the construction and may be extended in the case that the permit holder files a request one month before its expiration.

Property is designated to one of the three main governance bodies, the Jamoat, the city Khukumat, or GBAO authority. As previously stated, all land in Khorog is owned by the government but individuals may purchase property and obtain a licence through this process. Without adhering to these processes, un-authorized housing may be demolished, and residents moved without compensation by the local government. As demonstrated in the construction of UCA in Khorog, houses may also be demolished to make way for construction, but it is required that residents who have the correct permits are given compensation and are re-housed, in accordance with the Land Code (chapters 5-7).

Khorog is characterized as a green city, combining architecture of the Soviet Era with unique Tajik and traditional Pamirian houses. Building height is generally restricted to 4 floors due to seismic activity, however, there are some exceptions. House construction is often undertaken by residents, using cheap materials such as crushed stones. The predominant existing housing typologies are detached, multi-unit, single-storey and duplex houses.

Land allocation for residential use and construction in Khorog follows national standards, assessment structures and monitoring processes. The allocation of residential land follows a 2010 government-led masterplan for the city. However, within the last 15 years, construction has been spontaneous within the city, and in which cases are not aligned to a General Plan or safety standards. There are a number of informal residential units that have been constructed without permits, often on the most at-risk areas to natural hazards, and sometimes on land where natural hazards have recently destroyed pre-existing housing and infrastructure.

Due to physical and environmental factors, land in the city is very limited. The implementation of building codes becomes difficult, due to the shortage of land which, in turn, complicates the allocation of land to public space (streets, sidewalks, public toilets, entertainment venues such as theatres and museums, public markets, libraries, sporting venues, squares, gardens, public hospitals, public schools, parks etc).

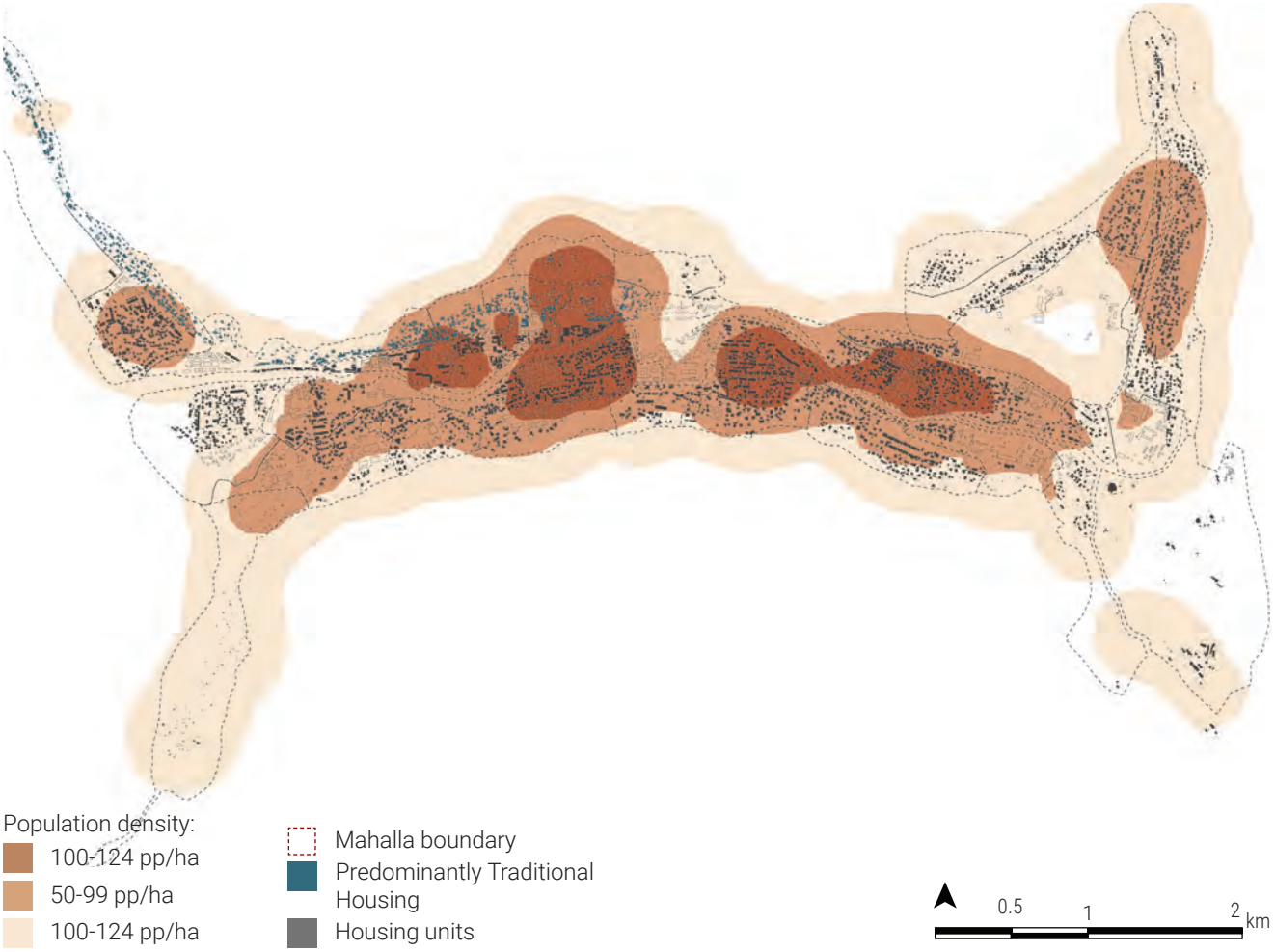


Fig 36. Map showing residential buildings, areas with traditional housing, cemeteries and building typologies.

Fig 37. A vehicle bridge in the central area of Khorog, May 2021

4.2. ECONOMY

4.2.1. National Economic Background

Tajikistan is the only country of the former Soviet Union that the World Bank classifies as a low-income economy. Agriculture remains one of the primary pillars of the economy, accounting for 21% of GDP. Although the country's lowest wages are paid in the agriculture sector, it is considered as the country's largest employer, especially in rural areas. Deteriorating infrastructure and services coupled with land degradation caused by the irrational use of agricultural lands and water resources, overgrazing by livestock, use of outdated technologies and other factors, minimise space for economic diversification.

Climate change poses significant threats to Tajikistan's economy. In addition, the absence of internal economic mechanisms for addressing socio-economic problems further increases vulnerability to climate.

Over the next 15 years, the government faces severe challenges. Tajikistan's government has referred to this period as a 'demographic window of opportunity', during which it is challenged with providing adequate infrastructure and employment opportunities for the over 45% of the population who were under the age of 20 in 2015, many of whom will enter the workforce by 2030.[36] The service sector accounts for the most considerable portion of Tajikistan's economy at 41%, but industry (27%) and agriculture (21%) remain essential. Agriculture's share of GDP is the largest in the region.[37]

Tajikistan's economy is highly reliant on remittances from abroad, primarily from Russia. These remittances, which amounted to 29% of the country's GDP in 2018 but can account for up to 50% in some years, fluctuate following the business cycles of the countries where the migrant workers are employed. Tajikistan's narrow economic base and consequently high dependence on remittances to finance the country's foreign trade deficit, make the country's economy heavily dependent on external factors. Russia's ongoing economic recession, however, has had a negative impact on the size of remittances and consequently, Tajikistan's GDP growth. This dependency on remittances poses a vulnerability to the country's economy and may affect the stability of financial resources, infrastructure development and public services.

Tajikistan's economy also encompasses a large informal sector, to which the limited domestic private sector is subservient, with very few new businesses being officially registered. Private sector companies account for only approximately 3 to 4% of GDP and approximately 11% of employment.[38]

The Government of Tajikistan assigns responsibility to two state agencies - the Ministry of Finance and the Ministry of Economic Development and Trade - for the development and enforcement of government policy and regulations regarding short-term to long-term strategies, programs and forecasts of socio-economic development, as well as disaster risk reduction programs for the country.[39]

4.2.2. National Investment Climate

While Tajikistan has a relatively well-developed regulatory framework for investment, the poor implementation of these regulations has led to an unpredictable and non-transparent regulatory environment for investors to operate in (the weak rule of law, judiciary system, and corruption).

The National Development Strategy identifies poor coordination across government bodies as a barrier to policy implementation. Tajikistan lacks a system for intermediate and final evaluation of investment projects.[40] This is related to the lack of a strategic vision that can aid in navigating major investment projects. The effect of insufficient state-led development initiatives is an institutional vacuum in the region. This vacuum has been partly filled by national and international organisations that took over spaces of governance and assumed capacities that would nominally be the responsibility of the Government.[41]

Improved mechanisms for screening investment projects against national development and environmental goals could help Tajikistan to harness foreign investment more selectively when projects are in the country's best interest. Given the number of large-scale infrastructure projects in Tajikistan and the state of public finances, its debt situation could worsen if not appropriately managed. By articulating the government's long-term development and climate goals more clearly and consistently in a mid-century development strategy, Tajikistan would be better equipped to weigh the costs and benefits of large-scale infrastructure projects.[42]

Logistical costs of trading in Tajikistan account for 22–25% of merchandise trade value; one of the highest ratios in the world. Landlocked geographical conditions, poor customs infrastructure and transit systems through Uzbekistan create serious disruptions to international trade and add significantly to logistical costs. The certification tariffs adopted in the processing industry

are also too high. Tajikistan ranked 179th among 181 economies in an ease of trade indicator in the World Bank's "Doing Business", 2012 survey as a result of poor trade facilitation and low levels of protection for local producers.[43]

4.2.3. GBAO's Regional Economy

Agriculture in GBAO is limited by the terrain and the altitude. More than half of the land in each of GBAO's districts – except Darvoz – is barren.[44]

Environmental challenges were exacerbated by the political transitions in the region. After Tajikistan gained independence in 1991, Gorno Badakhshan's economy collapsed and was faced with shortages of most basic goods. This situation was aggravated by the outbreak of the Tajik civil war in 1992. GBAO suffered heavily, as opposition forces used the poorly accessible area as a base to continue the war after losing the fight for the capital Dushanbe. [45]

In the Western Pamir region of GBAO, there is a high rate of emigration to work in Russia, of between 22 and 30%. A very small percentage of people from targeted communities have relatively low paid jobs in government. These are schoolteachers, health workers, forestry workers, Jamoat administrators etc. Remittances from family members working abroad, mainly in the Russian Federation account for a major part of the family income.[46]

The lack of effective governmental development programs is especially visible in the GBAO where many people depend heavily on external aid and resources. This is reflected in national poverty statistics, which claim that 39% of the population in the GBAO live in

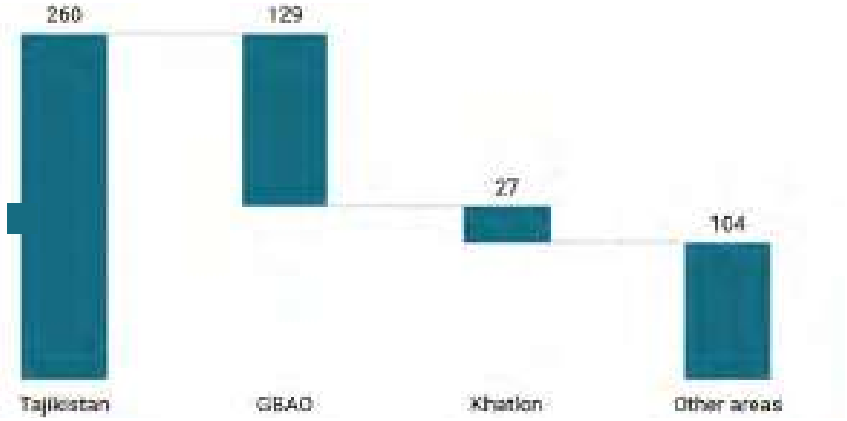


Fig 38. Average number of tourists that each incumbent operator brings to Tajikistan annually. Source: The World Bank, Tourism in Tajikistan as seen by tour operators

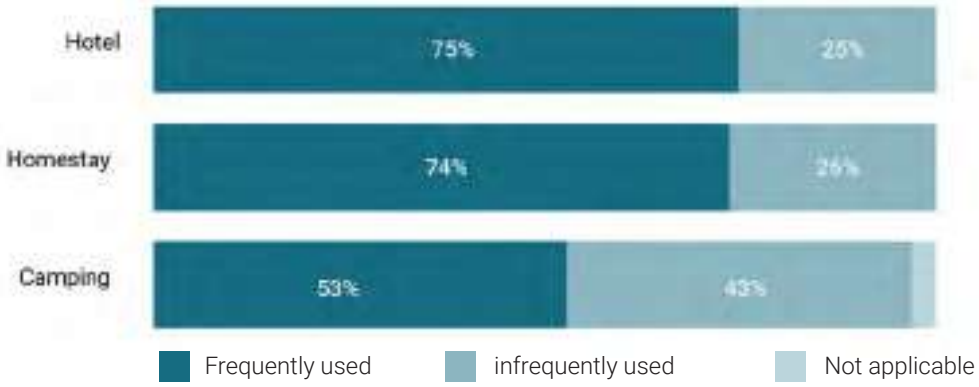


Fig 39. Incumbent operators reporting the frequency of use of accommodation services in GBAO. Source: The World Bank, Tourism in Tajikistan as seen by tour operators

conditions of poverty. In rural GBAO, 47.2% of the population lives in poverty, while in urban GBAO, the number is lower, at 18.4%.[47]

Today, to a certain degree, GBAO is still heavily supported by international humanitarian aid and development assistance, above all through the Aga Khan Development Network (AKDN).[48] For example, Aga Khan Foundation (AKF) works to empower communities through community-based savings groups. This is complemented by support from Rushdi Kuhiston, a community-owned Micro-Loan Organisation providing financing for investments in agriculture, non-farm enterprise, and other purposes to borrowers in rural and remote areas where commercial loan capital is unavailable, and investments are too large for savings groups.

As the majority of the GBAO inhabitants live in rural areas, many programs supported by international donors aim to restructure and recognize property rights in Tajikistan and the region. Below are a few examples:

- **Land Reform and Farm Restructuring Project** (LRFRP): [2013-2016] - supports farm restructuring and recognition of property rights in Tajikistan (USAID). LRFRP supports the advancement of policy and legal developments related to land rights, increasing awareness of land use rights among rural citizens and stakeholders, simplifying the registration procedure for the acquisition of land-use certificates, and strengthening government capacity to monitor and implement land reform.
- **Access to Justice Program:** (A2J) (Helvetas Swiss Inter-Cooperation) - guided by the goal to contribute to increased respect and protection of rights of poor and marginalized people in Tajikistan by strengthening the rule of law (RoL), access to justice, and measures for improved administration of justice.
- **Land Registration & Cadastre System for Sustainable Agriculture Project:** (LRCSP) (The World bank) - expanding farmland restructuring activities under the Farm Privatization Support Project, to enable more rural people to become independent farmers and take management decisions in response to market forces. LRCSP, in its final phase, established pilot sites in Kulyab, Khujand, Khorog, Gisar, Istaravshan, Rasht, Bokhtar, and Vanj to begin testing of a system for practical registration of rights to immovable property.

The tourism sector employs approximately 20,000 people, 60% of which workers are women. Tourism arrivals have doubled every year since 2014, of which a significant proportion travel to the GBAO.[49] The number of visitor arrivals at national borders has increased drastically from 160,000 in 2010 to 1,035,000 in 2020.

The region's landscape is attractive to adventure tourism, where mountaineering, climbing, rafting, kayaking, hiking, extreme skiing and other activities are possible. The Pamir peaks are some of the most sought after by world-class alpinists and the Pamir Highway is becoming a classic route for cyclists.[50] While it is not explicitly clear how the tourism sector supports local economic development, it is estimated that 15,000 yearly tourists represent a significant source of income for 223,000 inhabitants of GBAO.[51] Studies have shown that homestays and hotels cater to the adventure tourists visiting GBAO, with around 200 homestays in the region.[52]

A new project funded by the World Bank aims to create income-generation opportunities in the tourism and agribusiness sectors in both GBAO and Khatlon. The project is expected to increase the number of jobs created for women and youth at risk, improved quality of homestay and touristic provisions, increased diversification of tourism products, and increased number of MSMEs (micro, small and medium-sized enterprises) that will receive tourism income in GBAO and Khatlon.[53]

The region's soil contains sizable quantities of gold, silver, tungsten, uranium, nickel and precious stones, which could prompt mining as a potentially lucrative source of revenue for the region. However, GBAO has not yet been able to establish mining activities on a comprehensive scale.[54]

In 2014, the head of the GBAO region, Sh. Jamshedov, specified in an interview three significant assets of

Government Authority	Role in Market Management
Ministry of Economic Development and Trade	Coordination of other bodies
The State Committee of National Security	Security and supervision
Ministry of State Income and Tax	Custom control
Ministry of Public Health	Sanitation
Tojikmatlubot (Union of Consumer Societies)	Organisation and governance incl. reporting to Khukumats and improvements to water and electricity provision

Table. 10. Government Authority and role in Market Management in Khorog

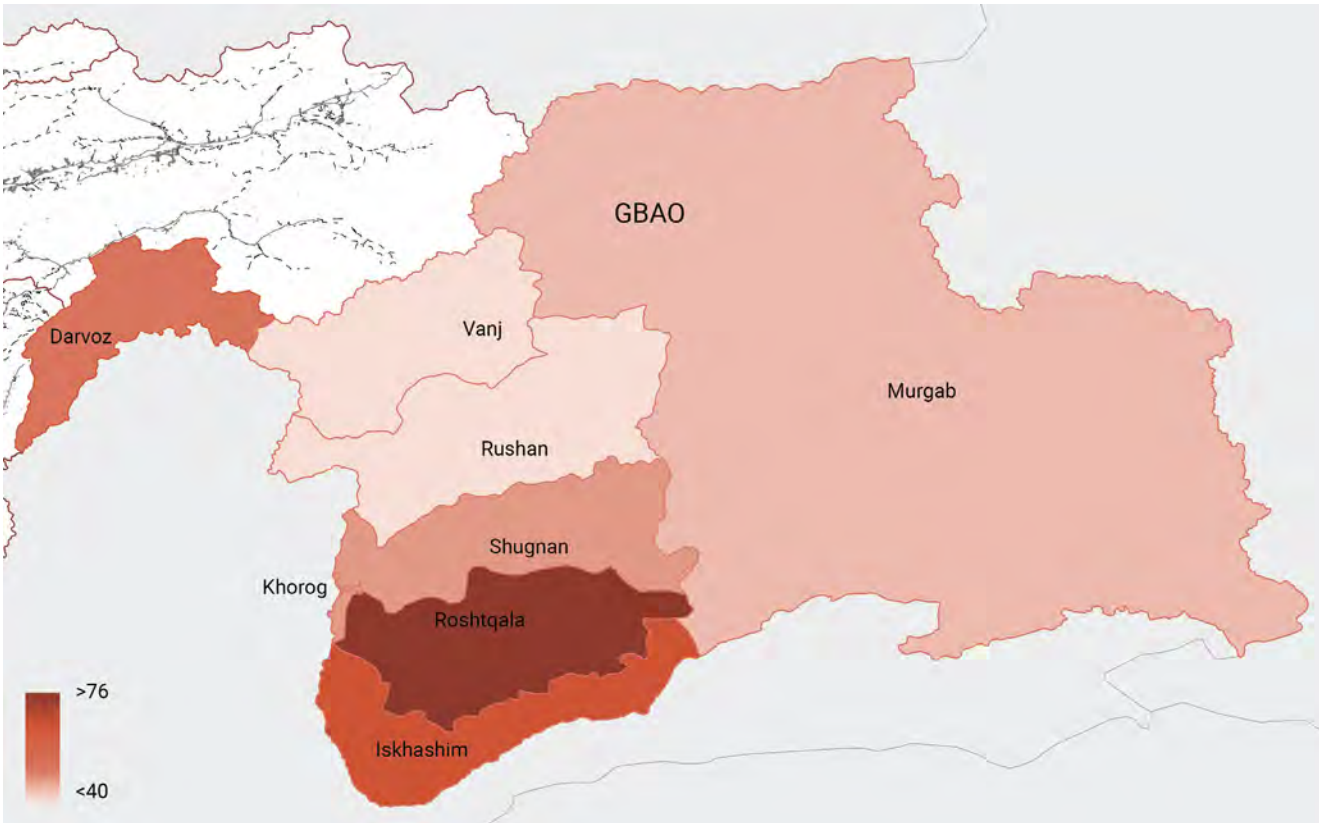


Fig 40. Poverty distribution map of Tajikistan (in percent of the population)

GBAO region that are important to consider for their development potential. These were:

- Tourism in its most varied forms, not least extreme, which involved creating "the appropriate image of GBAO in the region of Tajikistan, adapted for active recreation, health promotion and rehabilitation".
- Development and generation of hydro resources and production of electricity.
- Mineral resources of the region, such as rare metals, as well as precious and semiprecious stones.

The GBAO is experiences ongoing fragility risks, resulting from the civil war (1992-1997). GBAO is also the poorest, most sparsely populated and geographically remote province that suffered significantly during the civil war. The 1,400km border with Afghanistan is also a destabilising factor in the region as some areas are controlled by non-government forces.[55] Afghanistan is a major source for the smuggling of drugs and other goods. Unrest or conflict in Afghanistan can increase the risk of refugee influxes to GBAO.

Unlike other regions of Tajikistan, the Pamiri population which constitutes the majority of GBAO's residents has a distinct ethnic and religious identity. In recent times, GBAO has witnessed the reoccurrence of clashes between local non-state actors and the central government over struggles for influence in the region.[56]

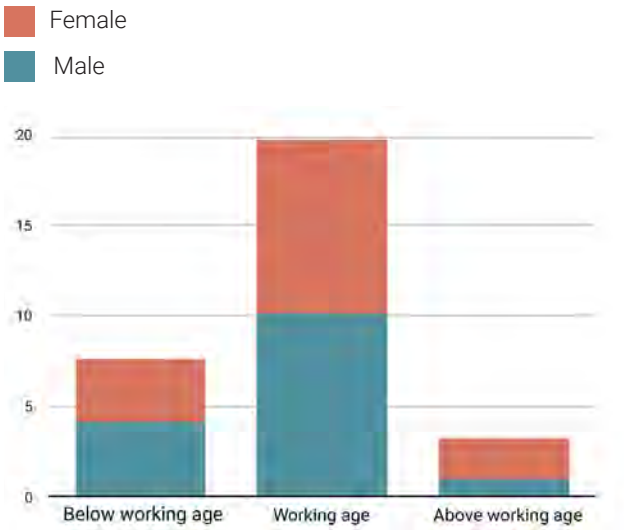


Fig 41. Poverty distribution map of Tajikistan (in percent of the population)

4.2.4. Khorog's Local Urban Economy

6 in 10 adults in Khorog have a source of income. The mean number of household members in Khorog is 5.3 and the mean number of household earners is 2.3.[57]

The local urban economy in Khorog is focused on the creation, access and facilitation of trans-border markets, and the export of hydroelectric energy. This is particularly relevant for Khorog, due to its proximity to the border with Afghanistan. Promoting trade in goods and ideas, in particular increasing food security, supports the local economy though means that focus is placed on this market, at the detriment of other businesses in the city.

As previously mentioned, a larger market in Tem, constructed in 2014, is located 5km north of the city, on a bridge across the river over the border to Afghanistan. This area operates within the Free-Trade Zone of Tem. The AKDN and UNDP's Border Management Program for Central Asia, that funded this project and that also supported border control, attempted to encourage predominantly female traders. Traders at the market range from 80 – 150 at one time.[58]

Alongside Tem market, Darwaz and Ishkashim have similarly key roles in both trade and movement of people. These three markets move approximately $3 million USD in traded goods including food, construction materials and electronic appliances.[59] The Tem, Darwaz and Ishkashim bridges give Tajikistan access to goods from China and from Afghanistan and increase food security for the region.

Industrial land use in Khorog is located predominantly South of the river. Industrial activities include energy production through hydropower plants, water handling facilities, dairy, and meat production. A large truck depot and a large number of car repair shops highlight the role that the city plays for long-distance goods transportation. Electricity is also traded with Afghanistan.

Economic activities such as transport routes and commerce are focused around the town centre, though there are further dispersals throughout the city. Shops and restaurants occupy the main land use category alongside the main entry road into the city. Various smaller nodes can be found throughout the city for neighbourhood-scale provisions of every-day goods.

There are numerous medical facilities, cultural and sports centres, education and research institutes within Khorog as detailed in the following chapter, which provide employment opportunities in the construction and running of institutions. These are also supported by training facilities and programs such as the medical training centre and adult training schools. Khorog's role as an administrative centre, provides additional opportunity for employment within the local government, with offices located predominantly in the town centre, and a new Mayor's office under development South of the airfield.

Tourism is considered an economic opportunity for Khorog. The UCA development may promote a demand for accommodation for temporary visitors, some of which is accounted for in existing development and plans for future phases of the university complex. Design and planning for these facilities may prove useful triggers for integration or may further segregate the university from the city. Several tourism agencies currently operate in the Wahan region of Afghanistan and run trips through Khorog. The Tourism Promotion Services (TPS), a subset of AKF, owns and runs tourist lodges in the city. Through the Mountain Societies Development Support Program (MSDSP), AKF also established the non-commercial organization of the Pamirs Eco-Cultural Tourism Association (PECTA) in 2008. This tourist centre promotes local, fair-trade crafts and advocates for a stronger tourism economy, particularly during peak season which runs from April to October. Tourist visas have become easier to obtain through PECTA's advocacy with the national government.

Economic activity in Khorog has been impacted by renewed social unrest that took place in 2012 and in 2018. This is evidence of the tensions that exist between local citizens and government security officers. A number of reasons, such as diverse ethnicities, the diversity of languages spoken and representation in authorities, education levels, poverty levels, climate risks, low employment rates, and cross border trade of drugs and arms, may have played a role in this outbreak. Although the economic emigration of many educated, Russian speaking nationals to Russia after the 1992-1997 civil war may have caused a degree of social fragmentation.[60]

Without adequate management, control and appropriate systems of governance and law, Khorog's location on the border with Afghanistan may lead to additional social friction as a consequence of illegal trade, unregulated cross-border movement and the use of the transboundary river as a water source. Security forces have a strong presence in the city. The World Bank's 2011 country economic memorandum states that widespread corruption at different points in the business chain is one of three main constraints to business growth and increases costs of doing business in Tajikistan.[61]

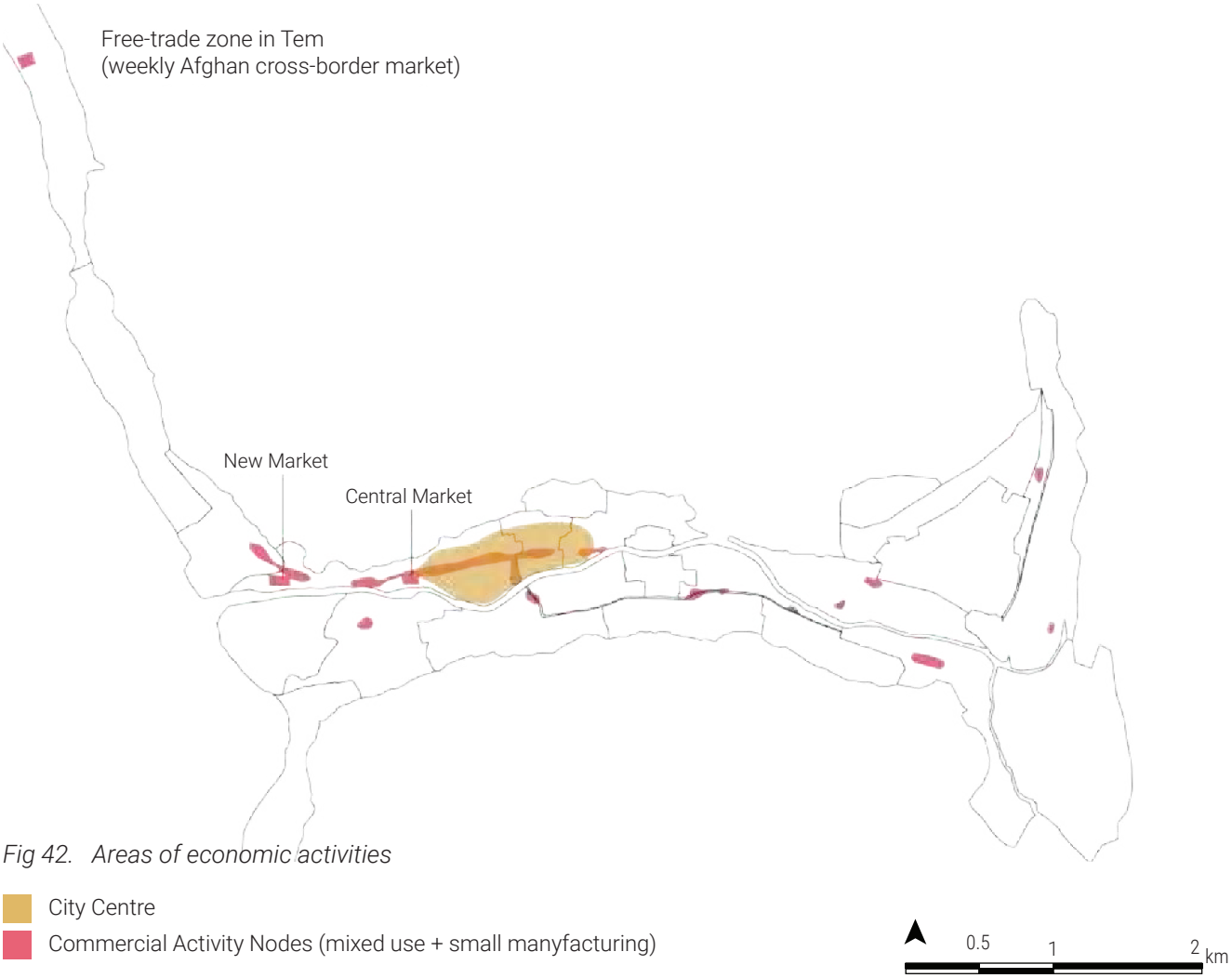


Fig 42. Areas of economic activities

4.2.5. Economic Programs and Incentives

Government or independent programs to encourage economic growth in the GBAO include:

- Local businesses support
- Pasture management
- Tourism development
- Small-medium businesses (SMI) support
- Marketing
- Helping returning migrants open their own business
- Support for start-ups
- Business training
- Technical and Vocational Education and Training (Asia Development Bank)

The MSDSP also encouraged community-based savings group, a credit scheme called the Gaja-system in GBAO in 2010 to provide more loan accessibility. The Gaja system is present in certain neighbourhoods within Khorog.

Increasingly there is a push for private-sector projects, supported by seed capital from the AKF through the Aga Khan Fund for Economic Development (AKFED). Examples of this type of project include Pamir Energy and the Serena Inn. The hydro-dam and Pamir Energy contribute to employment rates in the region. Additional contributors to the local economy include the UCA, which currently has 100 employees that are resident in Khorog. The UCA campus construction created 700 jobs, of which 90% were taken by local residents. The health centre established in December 2018 and expanded in 2019 by the Aka Khan Heath Services (AKHS), employs around 130 staff members.

In addition to this, the Accelerate Prosperity organization was established in Khorog in 2016, as an economic support system that provides advice and capital for small businesses. This organization has invested $645,000 USD in GBAO and $283,000 USD in Khorog specifically, across 22 business projects.

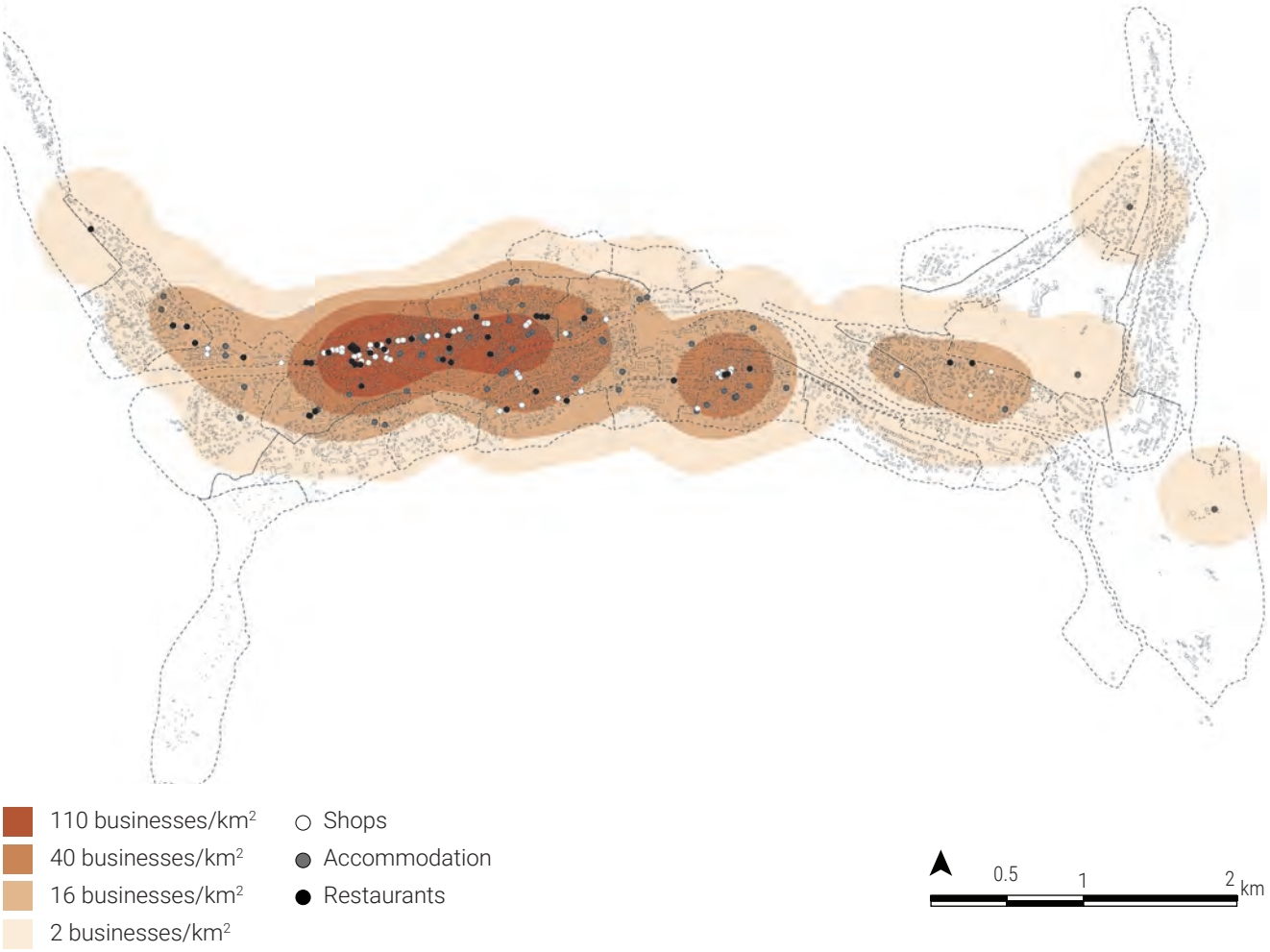


Fig 43. Concentration of economic activities in Khorog

The Social Welfare Department in Khorog suggests that in 2016, 1,095 households (approximately 19% of the total 5,802) received targeted social assistance. By June 2017, 590 households (approximately 10%) were registered for this support.

In cooperation with the AKDN, the First Micro-Finance Bank – Tajikistan (FMFB-T) was established in 2003 and started operating in 2004. However, the efficacy of this program is reduced by high interest rates (24-35%) for consumer need loans of up to 10,000 TJS, and fast loans of up to 3,000 TJS that can be accessed within 30 minutes. The only loans with low interest rates are for agricultural, seed and fertiliser loans of up to 80,000 TJS at an interest rate of 10% .

Existing banks and financial infrastructure within Khorog include:

- Micro credit & Microfinance Bank in Khorog
- National Bank in Khorog
- Orionbank
- Amonatbank
- Business Centre Garant

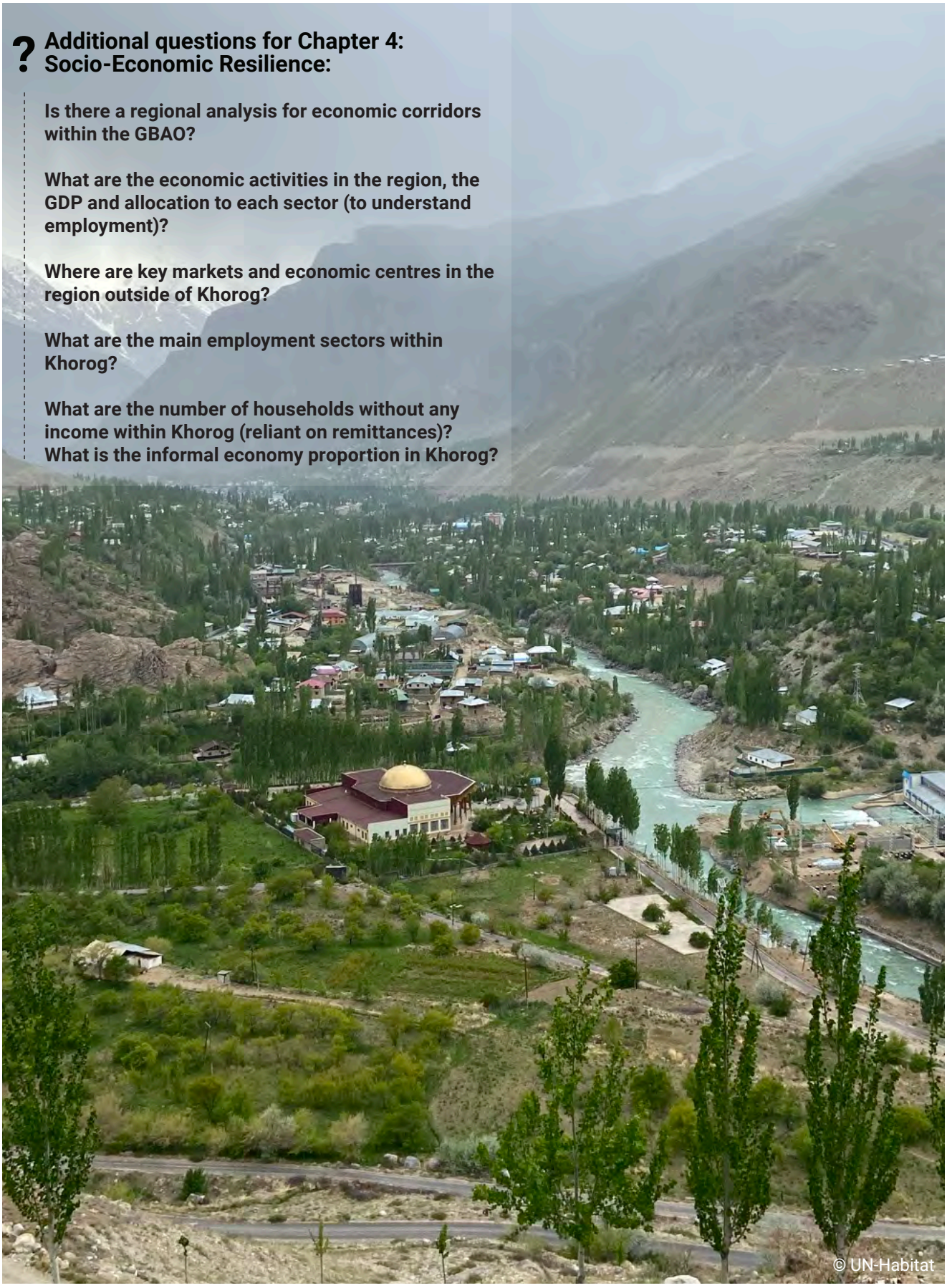


Fig 44. View on Khorog from Botanical Garden, May 2021

Fig 45. A street in the central area of Khorog, May 2021

5

RESILIENT INFRASTRUCTURE AND BASIC SERVICES

Tajikistan's infrastructure remains substandard, despite gradual improvements. The country's poor infrastructure contributes to very high trade costs that restrict the country's access to nearby markets such as the People's Republic of China and Afghanistan as well as the Russian Federation, a major export destination.[62] Deteriorating Soviet-era infrastructure such as irrigation channels, roads, dams, bridges, and river embankments has increased the population's exposure to risks associated with extreme weather events and earthquakes.[63]

Out of the USD 33.3 billion of currently under-construction and tracked planned investments, energy projects account for over 58% (USD 21.6 billion) of projects, while transport, mining and quarrying make up 18% and 13% respectively. Manufacturing, water supply and sanitation account for only 3% (USD 945 million) and 1% (USD 358 million) of planned and under-construction investment projects respectively.

Energy investments are divided into electricity generation projects and electric power transmission and distribution. Such a strong focus on hydroelectric power plants is in line with the government's objective to develop its capacity to sell power to neighbouring countries, particularly Afghanistan and Pakistan. One of the most significant sources of financing for large infrastructure projects such as transport and energy facilities, as well as power plants and power lines are China's Belt and Road Initiative (BRI), which the Government considers as a tool to finance its national development projects as part of the National Development Strategy 2030.[64] Many of the projects under the BRI are within the GBAO, which is further discussed in the mobility section.

The GBAO region's infrastructure was largely built during integration in the Soviet Union, providing relatively good access to roads, electricity and telephone lines in the majority of villages. However, due to lack of maintenance, the quality of these facilities has deteriorated. Topography and sparse population distribution in the GBAO also limit the provision of adequate infrastructure.

Khorog provides key health and education facilities and financial services for the whole of the GBAO region. Although some smaller facilities are located in Murgab and Ishkashim such as drug stores and clinics, regional accessibility is poor and unreliable. Khorog's infrastructure, like that of the GBAO, is deteriorating and utilities supply has not kept up with the city's growth rate.

5.1. PUBLIC FACILITIES AND SOCIAL INFRASTRUCTURE

5.1.1. Health

Tajikistan's health system has evolved from the Soviet model with few structural changes.[65] As a result of the civil war and the collapse of the Soviet Union, public social services have deteriorated, although there have been some recent improvements. The Soviet-style health system was comprehensive but highly centralized, underfinanced and inefficient. The Tajik health system has embarked on new mechanisms of management, financing and functioning. The organization follows the administrative structure of the country, with services organized according to the horizontal tiers of administration or into separate vertical pillars in the case of national programs.

Limited public funding in the health sector has resulted in low-quality health-care services, as manifested by the deterioration of hospital infrastructure (especially in rural areas), outdated medical equipment, and by a shortage of drugs. As a result, Tajikistan is consistently ranked among countries with the highest out-of-pocket health expenditure.[66]

A spatial analysis of healthcare facilities reveals that the majority are concentrated in larger urban areas and settlements, while smaller towns and villages have limited access. As such, inhabitants rely heavily on road infrastructure to access health facilities in the nearest city. This highlights the inter-dependence of road accessibility and quality healthcare provision in Tajikistan.

In GBAO, schools and medical centres are present in almost all villages but are in poor condition and lack well-trained staff. The region's sparse population distribution further aggravates access issues. In 2014, there were only 47 health care institutions in GBAO, servicing a population of around 205,949 people.[67] The map below highlights coverage and density of medical facilities in Khorog and rural settlements in GBAO.

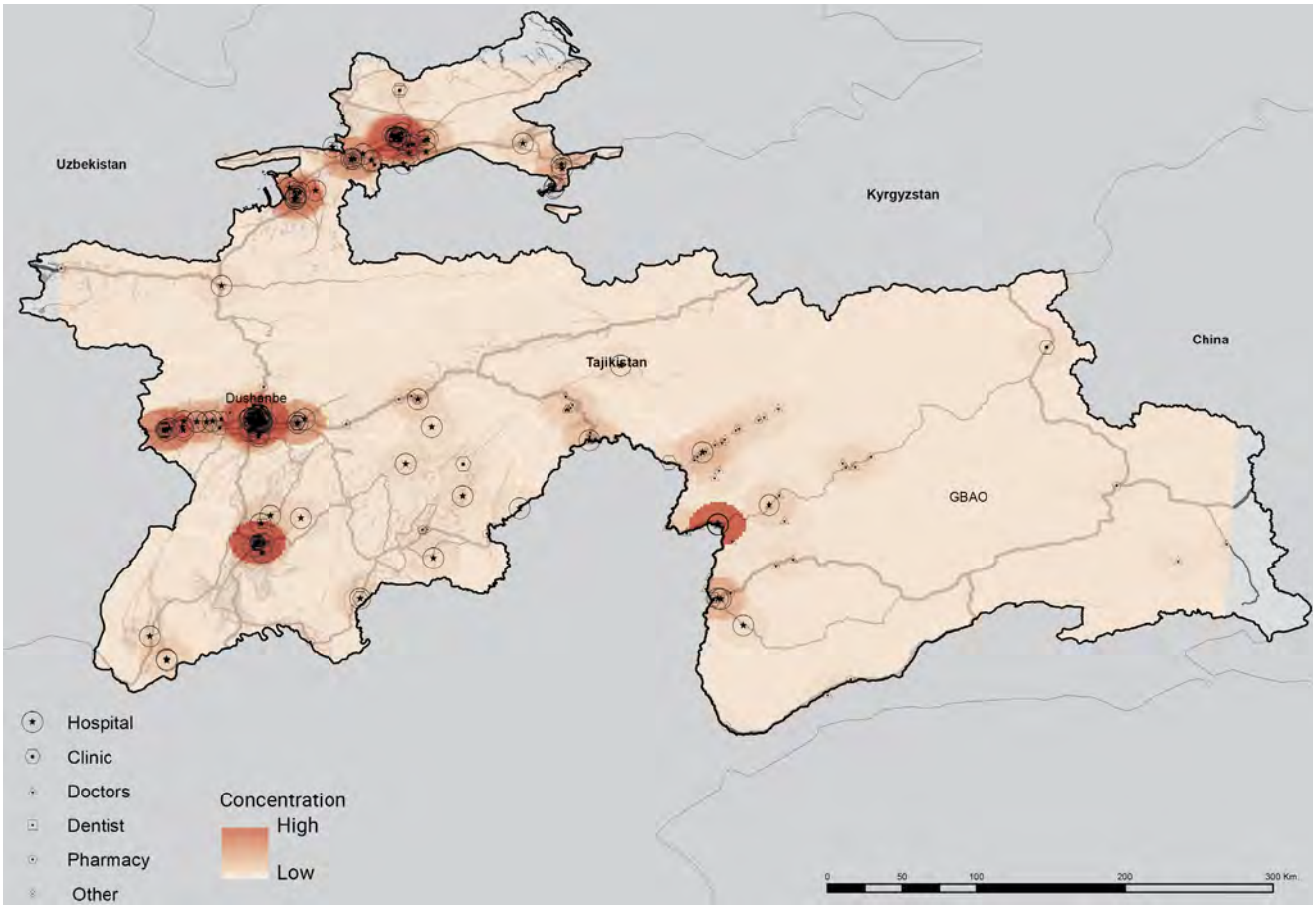


Fig 46. Access to healthcare facilities

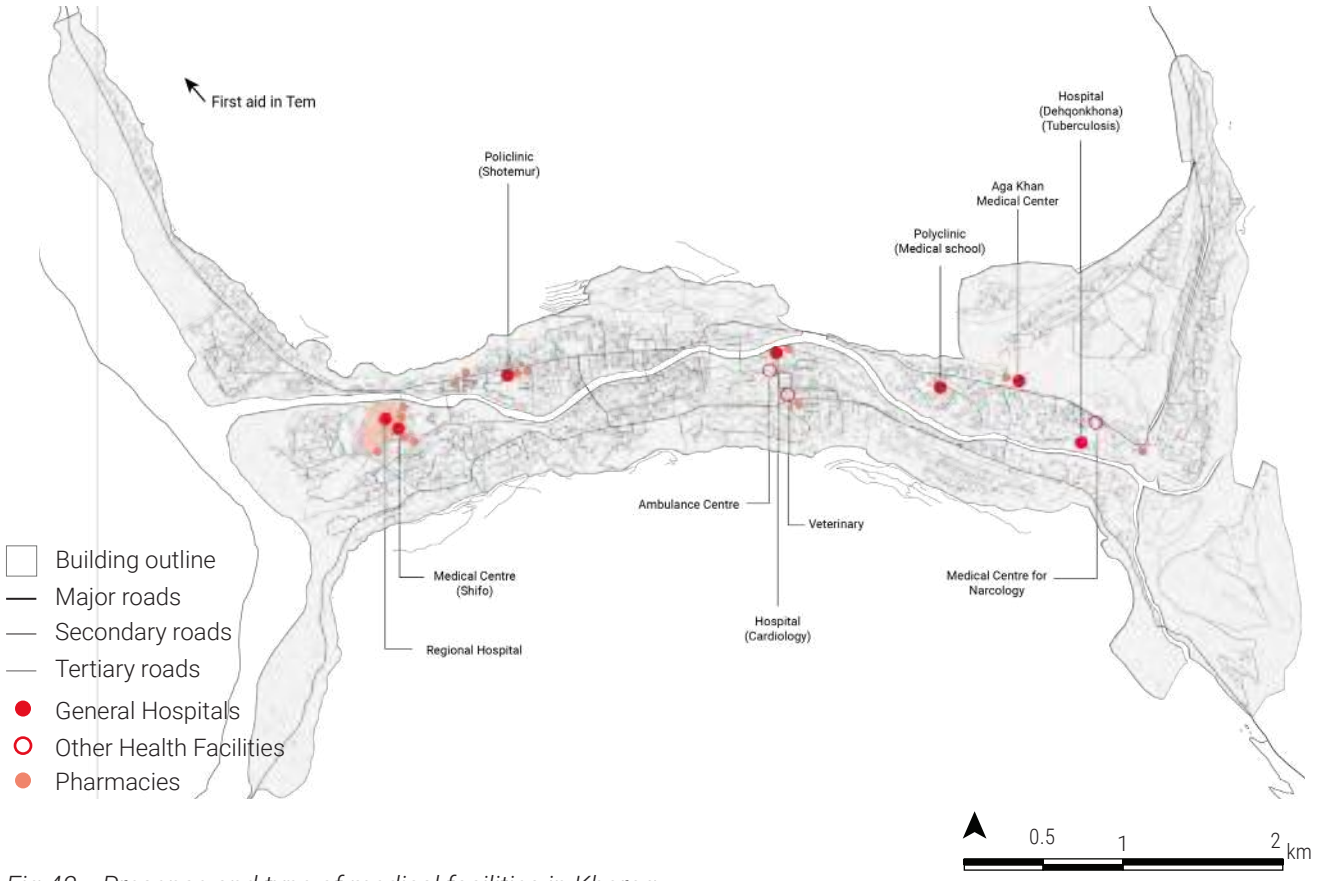


Fig 48. Presence and type of medical facilities in Khorog

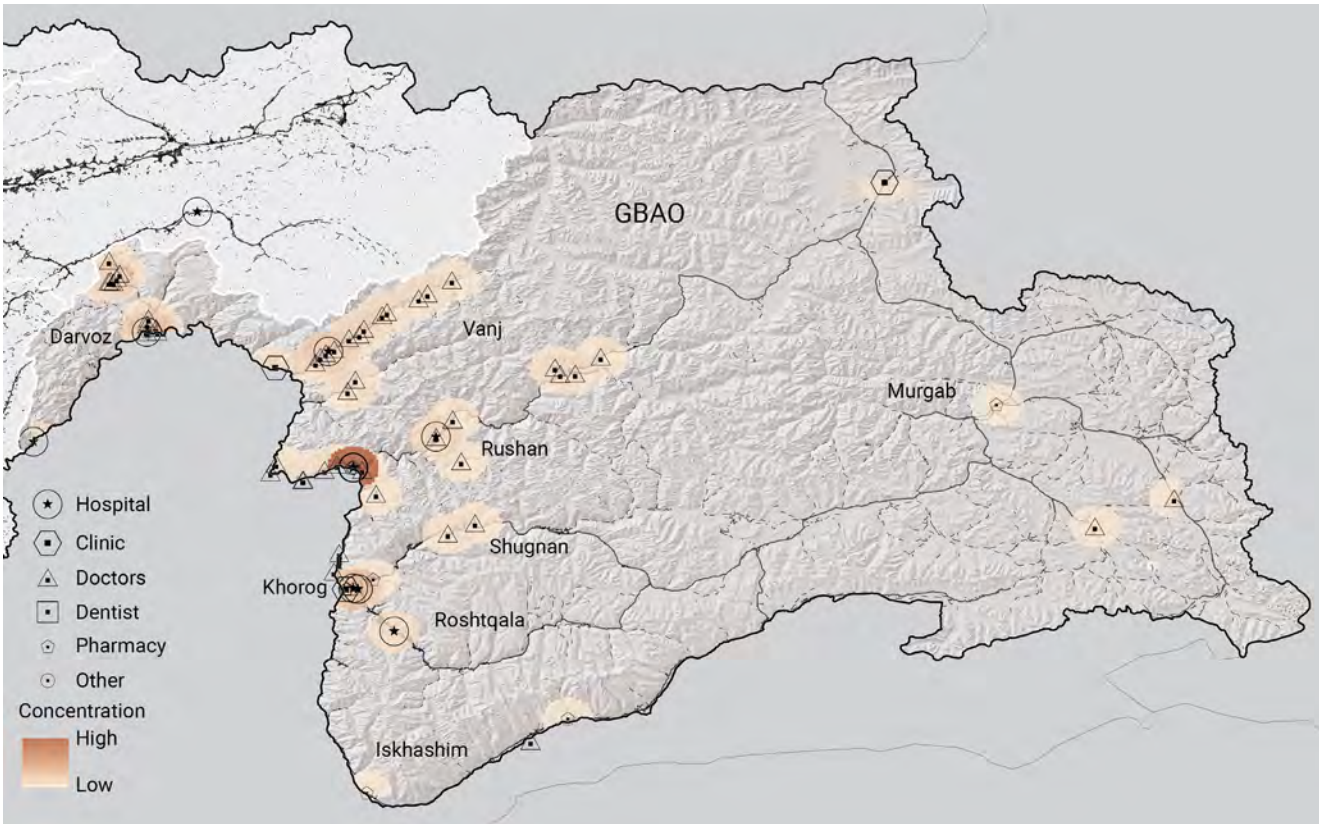


Fig 47. Presence and concentration of medical facilities in GBAO

The region's main hospital is located in Khorog, while other core medical centres are located in Murgab, Ishkashim and Shugnan districts. This means that in the case of serious illness, a patient would have to be transferred to a regional hospital located at least 100 km away. As roads are the only means of transport within the region, access is restricted during winter at which time they are heavily impacted by snow. The region's access to drugstores is also limited, with only four in total for the region, two of which are located in Khorog, one in Ishkashim and one in Murgab.

There is a relatively high concentration of health facilities in Khorog. These include general hospitals, specialized facilities, pharmacies and medical training centres.

The Aga Khan Medical Centre established by The Aga Khan Health Service, Tajikistan (AKHS, T), was opened in May 2017 and began operations in December 2018. The hospital expanded in 2019, to accommodate an additional 48 beds.[68] This health centre has collaborations with Aga Khan Health Board USA (AKHB USA) and the Ismaili Health Professionals Association (IHPA). The health centre is located on the lower plateau, beneath the UCA. Departments include Emergency, In-patient accommodation, Out-patients, Laboratory, Imaging, Maternity and Surgery.

Additional health facilities in Khorog that are supported through training and courses conducted by the AKHS, include the Family Medicine Training Centre, Khorog Oblast Family Centre, Policlinic, Khorog Central Hospital and Diagnostic Centre, a Dental Clinic, and pharmacies. Clinical excellence centres have also been established by AKHS to provide information support to doctors and nurses in the community. There is also a Regional Cardiology Centre located close to the river on the North-Eastern side of the city.

Challenges to health services in Khorog include the training and capacity-building of local staff for newly built or existing health facilities to function. Training in Khorog must also cover and be adaptable for smaller, less equipped health facilities in smaller villages and settlements of the region. Proximity to the porous border with Afghanistan and the illegal trade of drugs may be a contributor to high transmission rates of HIV/AIDS and other drug-related health issues.

Fig 49. Afrea of the marketplace in Khorog, May 2021

5.1.2. Education

Although Tajikistan has a high literacy rate, there are complex barriers that prevent some children from receiving formal education, including socio-economic status of households, parental education levels, and access to educational facilities. Enrolment in general secondary education is high and on the rise, increasing from 91% in 2006 to 95% in 2016. However, the rates do not reveal critical concerns such as declining education attainment rates, increasing dropouts and gender imbalances. The completion rate of general secondary education in 2016/17 was 65%. While general basic education is mandatory and funded by the state, upper secondary education is neither compulsory nor free. According to UNICEF, Tajikistan's variation in school attainment across the country can be explained by the insufficient number of schools, lack of quality infrastructure and time required to travel. This is further exacerbated by weather conditions that inhibit the ability to commute to school, either by foot or vehicle.[69]

Enrolment rates in general secondary education have declined in GBAO from 47,210 students in 2007 to 37,806 in 2016. This could be due to high poverty rates that impact the ability to pay fees. Considering the region's spatial distribution, educational facilities can be distant and impacted by the low reach of service infrastructure (i.e., electricity shortage, lack of heating).[70] The map below highlights coverage and density of education facilities in Khorog and rural settlements in GBAO.

In Khorog, 61% of the population is educated to a bachelor or higher degree level, 34% to high school level, and 4% to middle school level. Khorog has two universities, fourteen schools and five kindergartens.[71] These education facilities are relatively evenly distributed across the city, however, considering the young demographic, kindergartens especially may not be sufficient in number for the current population figure.

The Khorog State University was built through the Aga Khan Development Network (AKDN) and the University of Central Asia (UCA). This university is internationally recognized. The University of Central Asia, Khorog began Phase I construction in 2017, which includes an academic block, laboratory building, student life building, and residences. The UCA development may provide a secondary node to the city, although physical connections are needed to integrate the complex into the rest of the city. The university buildings are planned at a very low density in relation to the space allocated, adjacent to large sports facilities and are on a raised, flattened area of land. The UCA welcomes predominantly foreign students, whereas the Khorog

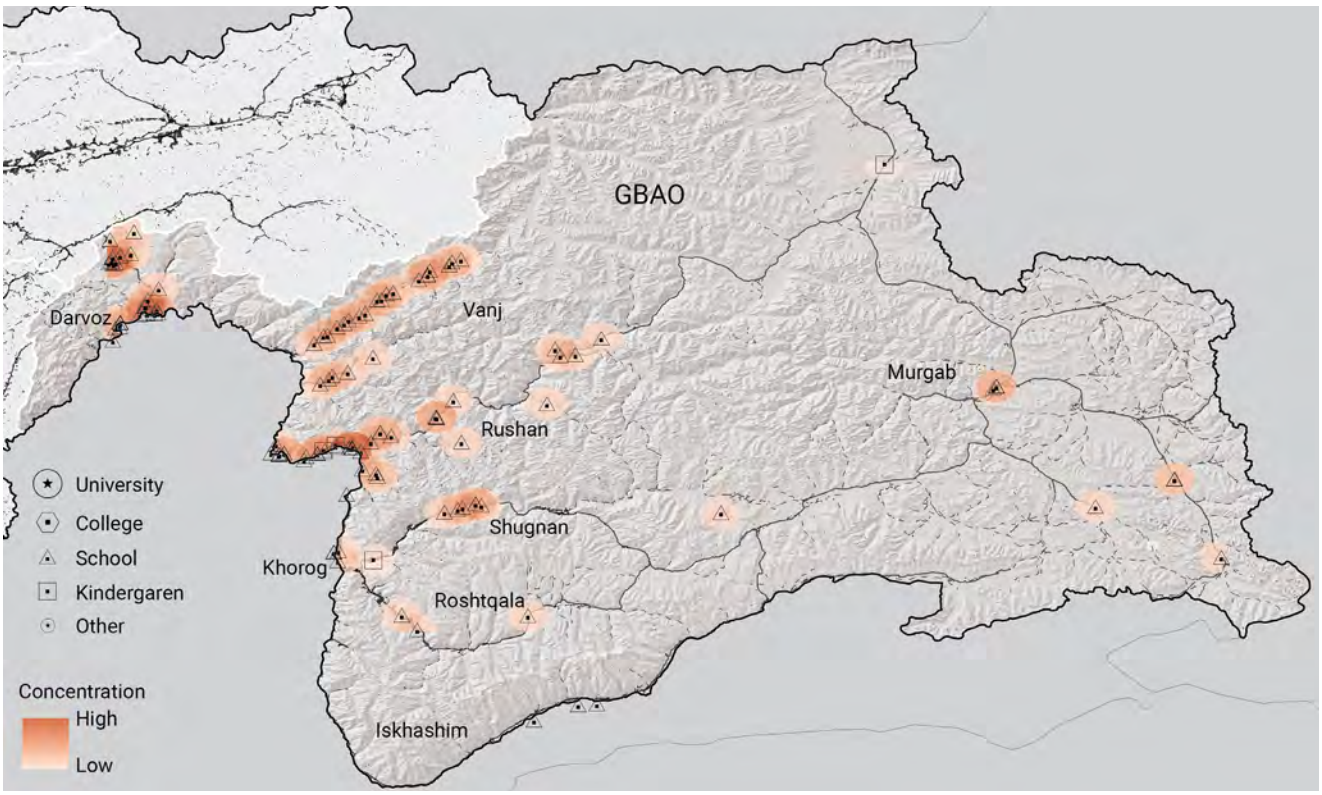


Fig 50. Presence and concentration of educational facilities in GBAO

State University is attended by students from districts within the GBAO. Students from Khorog tend to travel to Dushanbe to attend university.

Additional learning programs associated with UCA include the 2019 School of Professional and Continuing Education (SPCE), which has initiated projects for capacity-building in business, financial literacy, 'tax and law' for individual entrepreneurs, maintenance and repair of water systems, management of tourism resources, and additional courses appropriate to market needs. The UCA's School of Professional and Continuing Education entrepreneurship program connects graduates to mentors and facilitates access to investment capital. The Mountain Societies Research Institute's "Pathways to Innovation" program, funded by Canada's International Development Research Centre (IDRC) and the Aga Khan Foundation Canada, was also established in collaboration with UCA. Finally, the Accelerate Prosperity incubator for business start-ups was established particularly for women and youth and is located in City Park.

The Institute of Public Policy and Administration (IPPA) was established in partnership with the Khorog State University in 2019. The IPPA initiated a regional research project to investigate the current state of important business sectors in regional mountain economies, and support capacity-building in higher education institutions.

The Aga Khan Lycée (AKL), is part of the Aga Khan Education Service (AKES, Tj) and was opened in September 1998. From 2013, though the Learning Support Program (LSP), the Allied Schools Project began, which provided an after-school tutorial program in rural Secondary Government Schools of GBAO.

Early Childhood Development Centres have also been established in Khorog to support early childhood development in response to limited kindergarten facilities. Some school facilities such as sports fields are also used by the wider community.

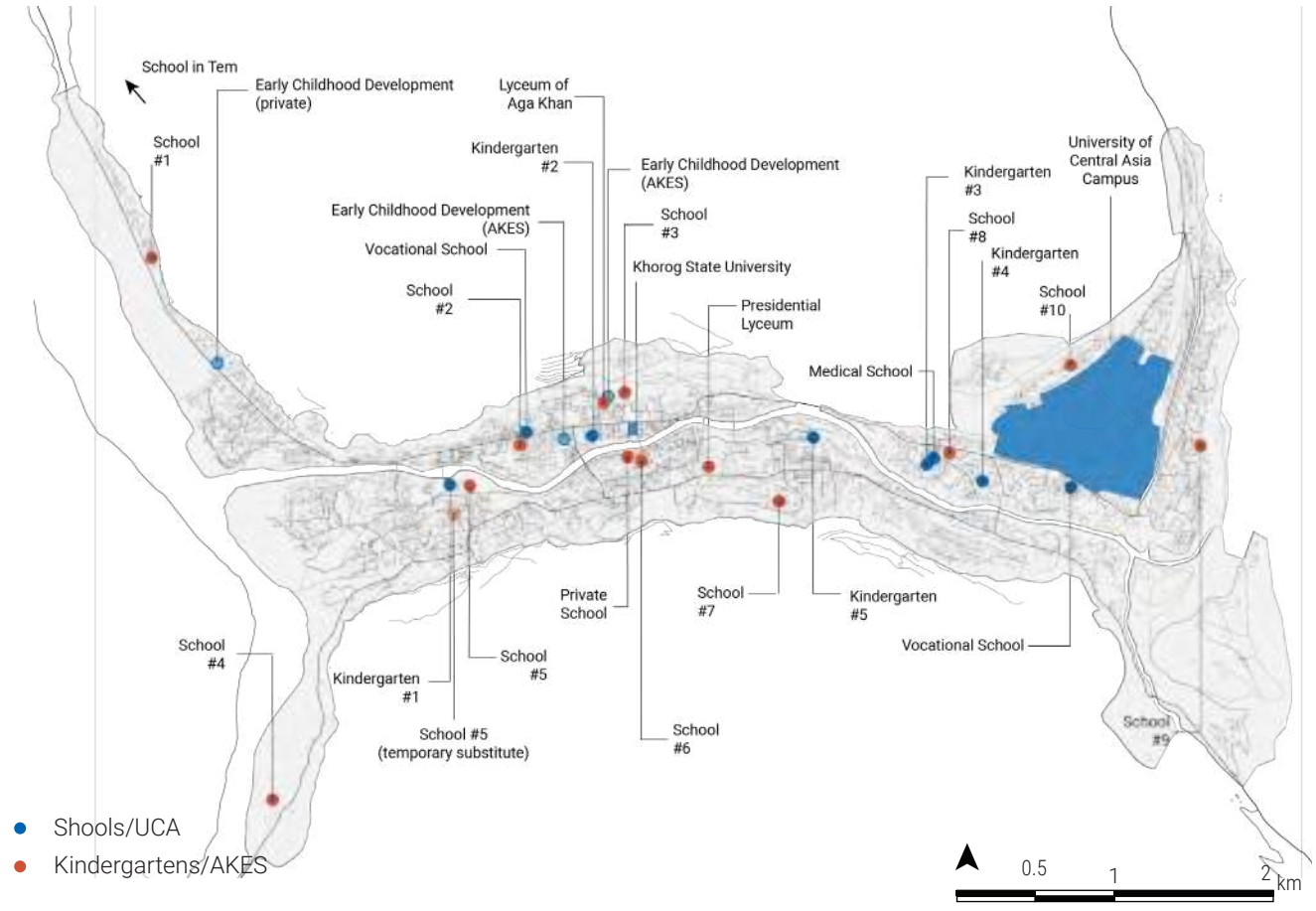


Fig 51. Presence and type of educational facilities in Khorog

5.1.3. Other Social Facilities

Tajikistan has a relatively comprehensive social protection system, which includes elements of social insurance, social assistance and social services. A "Targeted Social Assistance" program was created in 2018 to "improve the capacity of the Government of Tajikistan to plan, monitor, and manage social assistance for the poor through the development of a national registry of social protection and the provision of training, equipment and related items for improving said capacity." [72] There is also a youth centre and centre for the elderly located in the city centre.

Religious facilities were promoted by the AKDN in Khorog through the development of the Ismaili Jamatkhana Center, a religious and social facility situated beside Khorog City Park and the Gunt River. Although this space is primarily for Ismaili communities, it is not necessarily a singularly religious site. It opened in December 2018 and provides a social hall, library, meeting and multipurpose rooms, an amphitheatre, and courtyards, covering 4,700 square meters.

Cultural traditions are upheld in Khorog through Pamir style houses, as well as the tourism industry which encourages production of traditional crafts to sell in the tourist office in Khorog. There is a Regional Museum within the city, as well as public statues and historical monuments such as the Ismail Somoni Statue, located on the North side of Lenin Street, East of Tash Muhammad Street, near Khorog State University. There is also a 1928 plinth at the Eastern end of Lenin Street. A 'Cultural Square' can be found on the North side of the Central Park, with a theatre and a library.

Additional cultural and leisure centres include a museum, library, theatre, movie theatre, bath house, and numerous restaurants and tea houses. A sports stadium, regional TV and radio station, and print house also exist within the city. A Roof of the World Festival has taken place in Khorog for the last 12 years, celebrating Pamiri culture. This draws international participants, some tourism, and is funded by the Swiss Cooperation Office in Tajikistan, the Swiss Embassy in Uzbekistan, Aga Khan Foundation, Tcell Company, University of Central Asia, "Bactria" Cultural Center, the Embassy of the United States of America in Tajikistan, and the Aga-Khan Music Initiative.

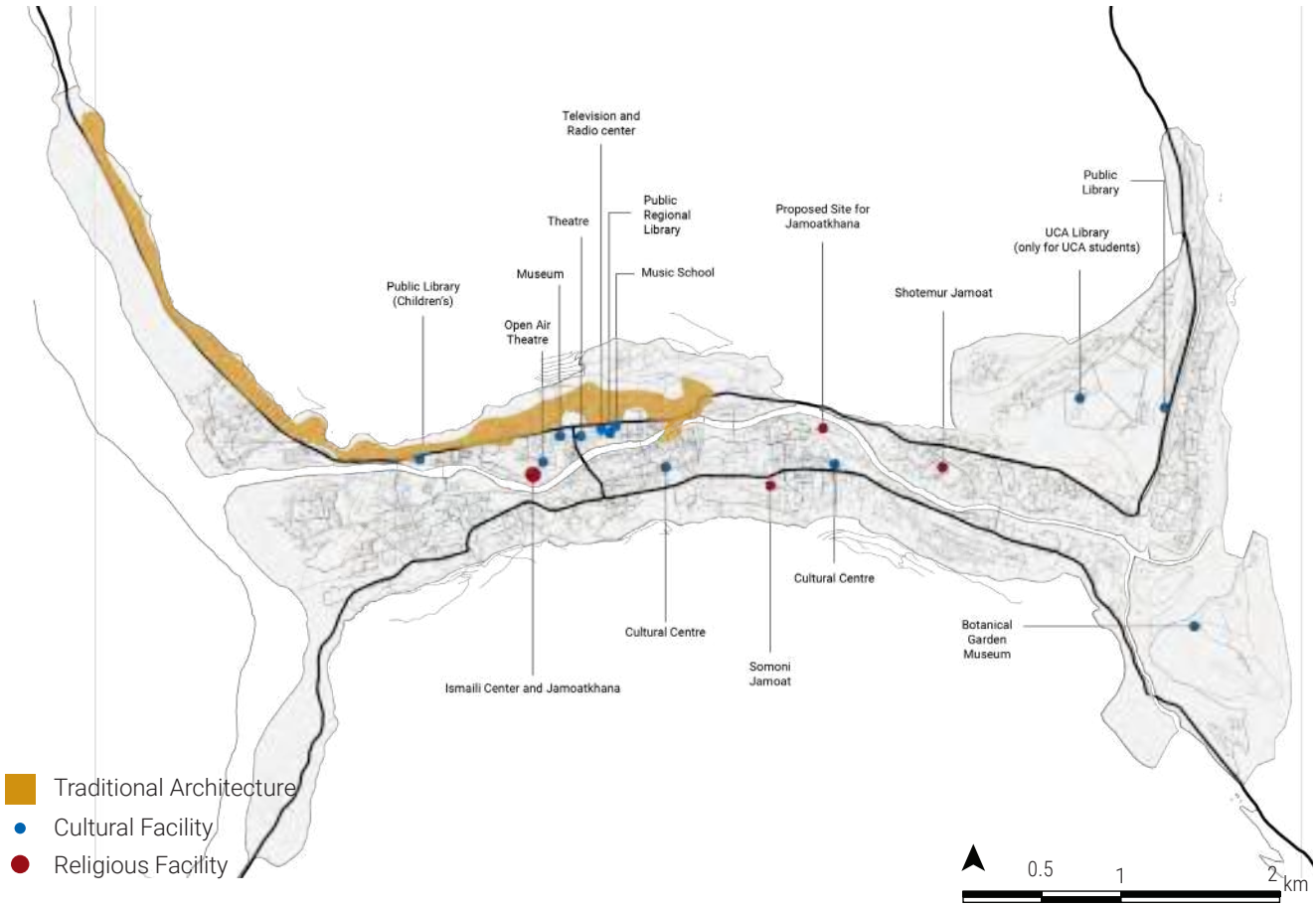


Fig 52. Presence of religious, heritage and culturally relevant sites in Khorog

5.1.4. Legislative Context to Social Infrastructure Allocation

According to Section 7 of GNiP RT 30-01-2018 on "Urban Planning and development of urban settlements", public spaces are subdivided into community centres and public spaces in residential and mixed development zones. Public spaces are allocated if public objects (administrative, business, scientific, educational institutions and service enterprises, public organizations, religious buildings and others) occupy at least 50% of all territorial stock. Public facilities should form an interconnected system of public spaces, integrated with residential, landscape and recreational areas, transport systems and open pedestrian spaces. When planning, building and reconstructing public areas, it is necessary to consider the town planning value of the entire territory and the requirements for the preservation of historical and cultural heritage.

5.2. MOBILITY AND CONNECTIVITY

The majority of Tajikistan's cargo and passengers travel by road. 96% of Tajikistan's freight turnover and 99% of overland passenger turnover in 2016 occurred by motorway. Motor transport accounts for 74.5% of total passenger turnover, and air transport accounts for the majority of the remainder (24.7 %).[73] Tajikistan's rail network, conceived of initially as a part of the broader Soviet system, consists of two unconnected lines (one running from Tashkent to the Fergana valley through Tajikistan in the north, the other linking Dushanbe to southern Uzbekistan). This explains the small modal share of rail in both freight and passenger transport.[74]

With no access to the sea, Tajikistan relies heavily on road transportation for trade. Its road infrastructure capacity must, therefore, increase by 191% by 2030 and by 516% by 2050 to maintain network performance. Several international roads forming parts of corridors that pass through Tajikistan have been identified as requiring attention for capacity increase. 83% of streets in the country are unpaved but projected increases to passenger and freight traffic may surpass the economic threshold to warrant paving.[75]

Figure 49 and Figure 50 shows an analysis of infrastructure accessibility, taking into account road location and density, proximity to airports, heliports and railway stations. The results reveal that the Western and Northern parts of the country are more accessible and better equipped with infrastructure, enabling internal travel and mobility, while the Eastern region is least accessible due to the topography and location of the Pamir Mountains.

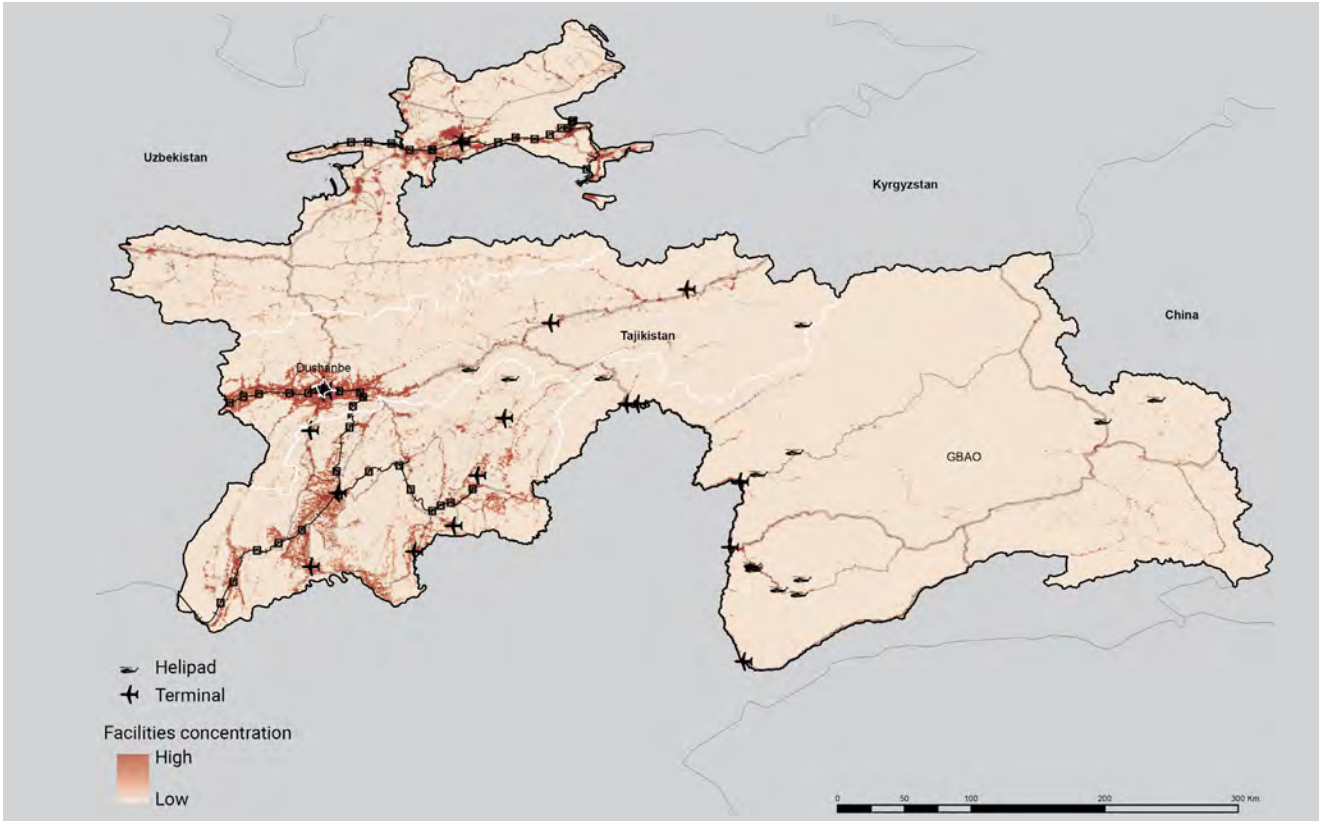


Fig 53. Key infrastructure relating to connectivity in Tajikistan

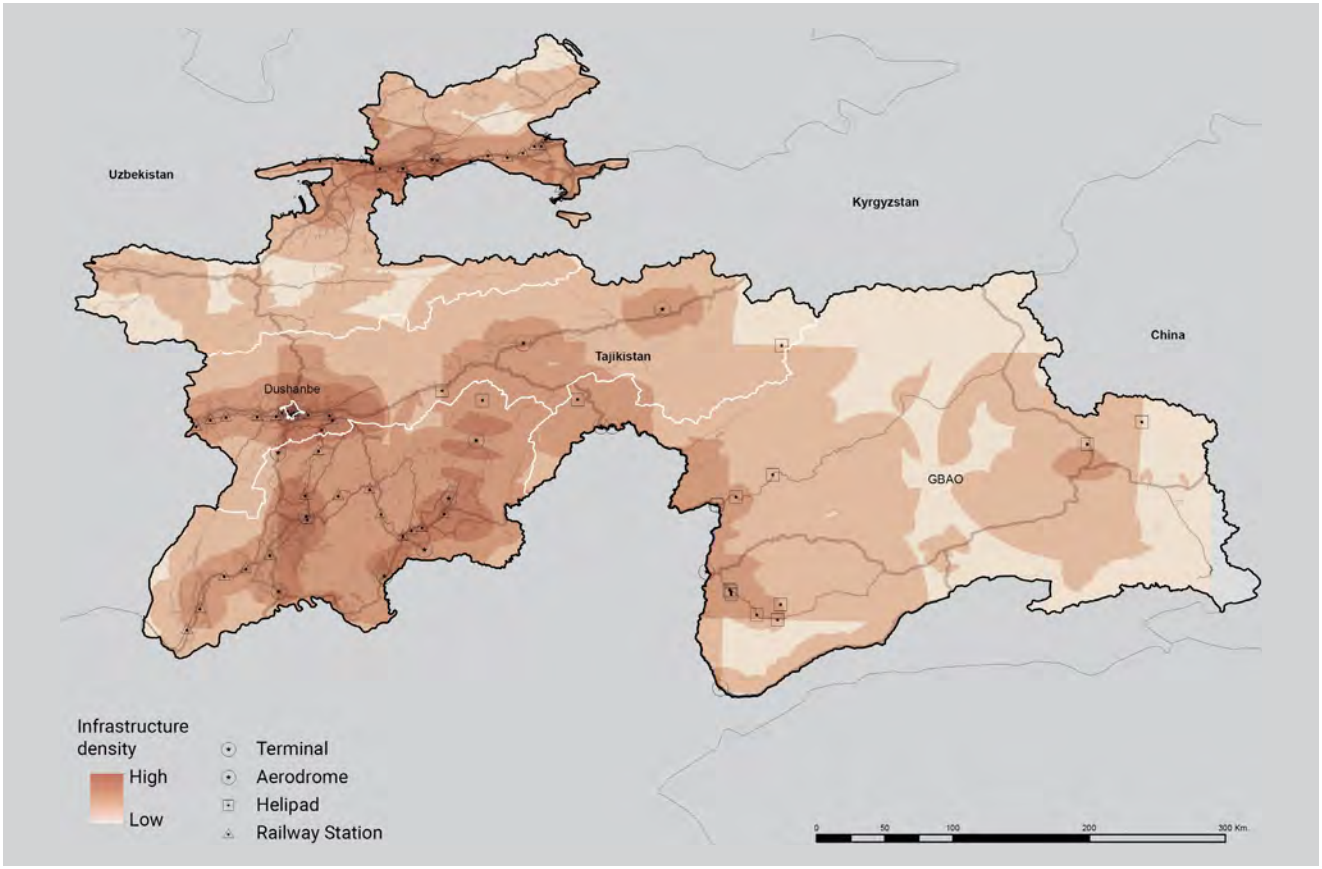


Fig 54. Analysis of infrastructure accessibility in Tajikistan

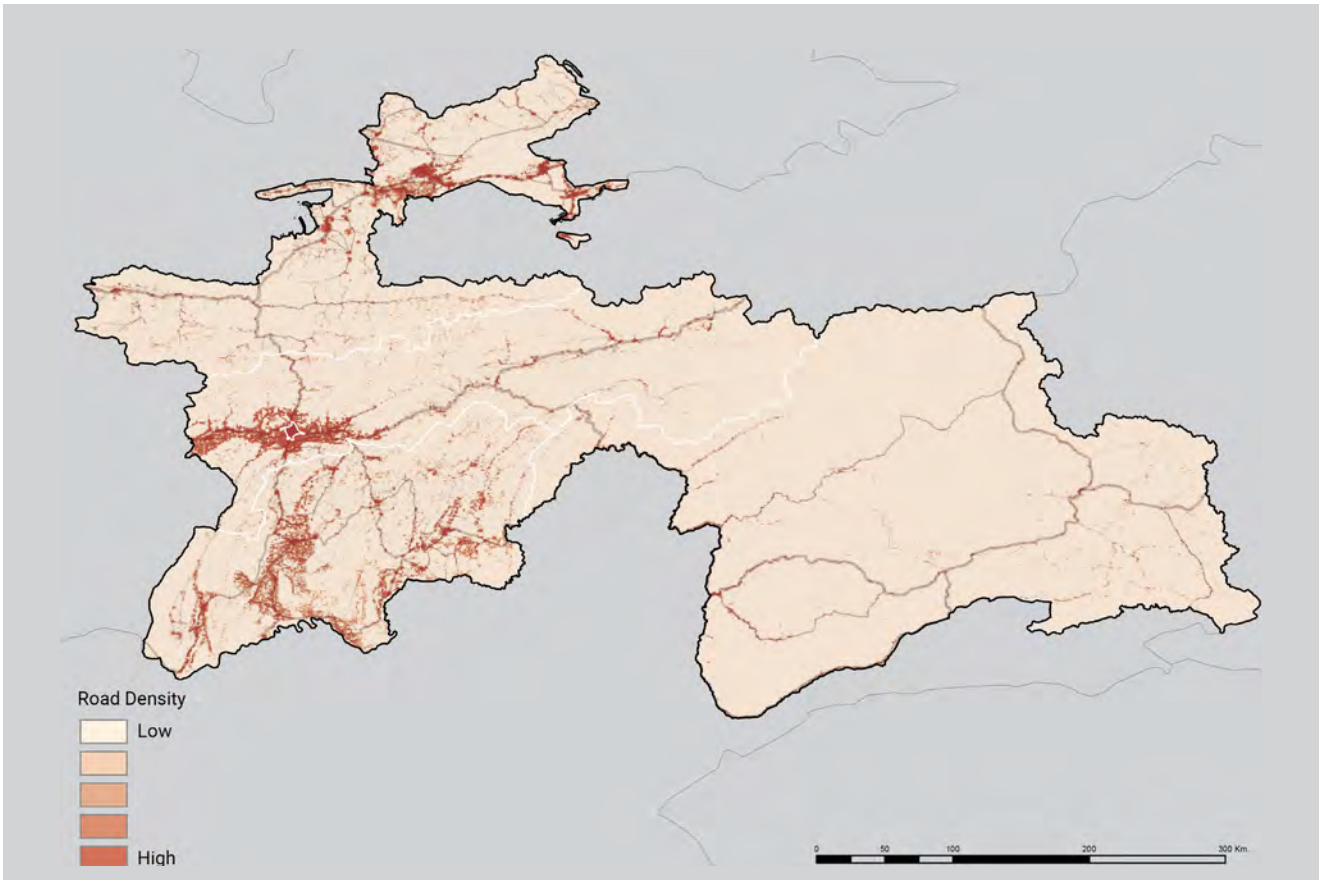


Fig 55. Road density in Tajikistan

Lack of connectivity, both domestically and internationally, is a significant barrier to Tajikistan's integration into regional and global markets. Currently, all of Tajikistan's international rail links run through Uzbekistan, and tensions between Tajikistan and Uzbekistan have led to border closures in the past. To circumvent Uzbekistan and diversify its rail links, Tajikistan announced that it will build international rail links to Afghanistan as part of the Turkmenistan-Afghanistan-Tajikistan (TAT) railway. Improved relations with Uzbekistan, however, may have reduced the speed of development of this project.[76]

GBAO has the lowest levels of connectivity in Tajikistan.[77] However, the geographical location of GBAO is strategically important; the region is a transit territory that provides a connection between the Pamir and the Fergana Valleys. After the opening of the Murgab - Kulma - Karakorum and the Kulyab - Darvaz highways in 2007, it also links Tajikistan with China, providing a faster route than the West Pamir highway along the banks of the Pyanj.[78] GBAO therefore, has the potential to become a hub capable of connecting China, the Indian subcontinent and Central Asia.

Despite the importance of roads to GBAO, the networks do not provide enough coverage to make the region fully accessible. A road density analysis reveals that the region's road connectivity is limited to certain parts of the region, as a result of the region's topography. Roads are not only limited in number in GBAO but are also extremely vulnerable to impacts of weather conditions and water levels. The M41, which is located in GBAO and passes through Khorog, is Tajikistan's only link to China and is frequently exposed to avalanches, mudflows, landslides, floods and rock falls. 83% of the roads are unpaved and would need upgrading to accommodate the increased freight and passenger traffic linked to the CAREC Corridors and the BRI. [79] A project with the World Bank aims to reconstruct 18 bridges in GBAO, particularly in Shohin, Davraz, Rushan, Murghab and Vanj districts.

Figure 48 demonstrates the results of a drivability analysis conducted to assess distances from Khorog, considering topography, road access, speed and road conditions.

Long-distance rail projects are planned to improve the connectivity of the country with neighbouring markets (e.g., the Russia-Kazakhstan-Kyrgyz Republic-Tajikistan railway and the China-Kyrgyz Republic-Tajikistan-Afghanistan-Iran railway [Five Nations Railway Corridor

Fig 56. Tem, May 2021

Project]). While it is unclear where these projects will stop exactly, they will positively impact the accessibility and connectivity of GBAO and Khorog, both nationally and internationally.

Figures 49 and 50 highlight routes and distances from Khorog to cities outside of the GBAO. Major routes between Khorog and towns and cities within the GBAO region include Rushan, Ishkashim, Murgab, Osh, Shugnan, Darwaz, and Tem. Key international roads from China and Afghanistan also pass through the city.

The M41 road, the Pamir highway, is a primary road of four lanes that connects Khorog to Dushanbe. This road follows the Pyandzh river from North to South, along the border with Afghanistan, before turning East and running through the town of Khorog. Due to its location, this road is regularly inaccessible due to snow fall, landslides and flooding. In addition, only 70% of this road is paved. The most inaccessible roads lie between Khorog and Dushanbe, Ishkashim and Murgab (close to the border with China). In fact, Ishakshim is considered to be entirely cut off during winter. The only alternative route between these three areas is an additional road between Khorog and Dushanbe, which is considered to be even more precarious as a result of its route through the mountains.

Khorog's roads can be grouped into categories that include:

i. international road A41, with four lanes of traffic
ii. communication or secondary road, with two lanes of traffic
iii. inter-urban roads, and
iv. informal or non-tarmac roads.

Khorog has a North-South primary road that connects in the centre of town and runs across the main bridge. Traffic is considered problematic for the city and is worse in the centre of town, adjacent to the main market area and bus parking terminal. New bus stations have been implemented in Tem to reduce congestion. Bus stops throughout Khorog are not formalized and are not formed of any shelter or formal signage. Bus stops can be made informally by passengers. Mini-buses and jeeps park alongside all roads within Khorog and stop at irregular intervals.

The main modes of transport in Tajikistan and Khorog are taxi mini-buses, that cost around 1 TJS for a distance of 4km, with a capacity of 8 people, including the driver. The longest route within Khorog can cost up to 2 TJS. The mini-bus taxi route between Khorog and Dushanbe (622km) can cost around 280 TJS per person and the speed limit on major roads can be 20km/h.[80]. This route can be unreliable due to weather constraints and mini-buses tend to leave once full, meaning there is no time schedule. Notwithstanding the many gas station facilities in Khorog, gas supply is unreliable.

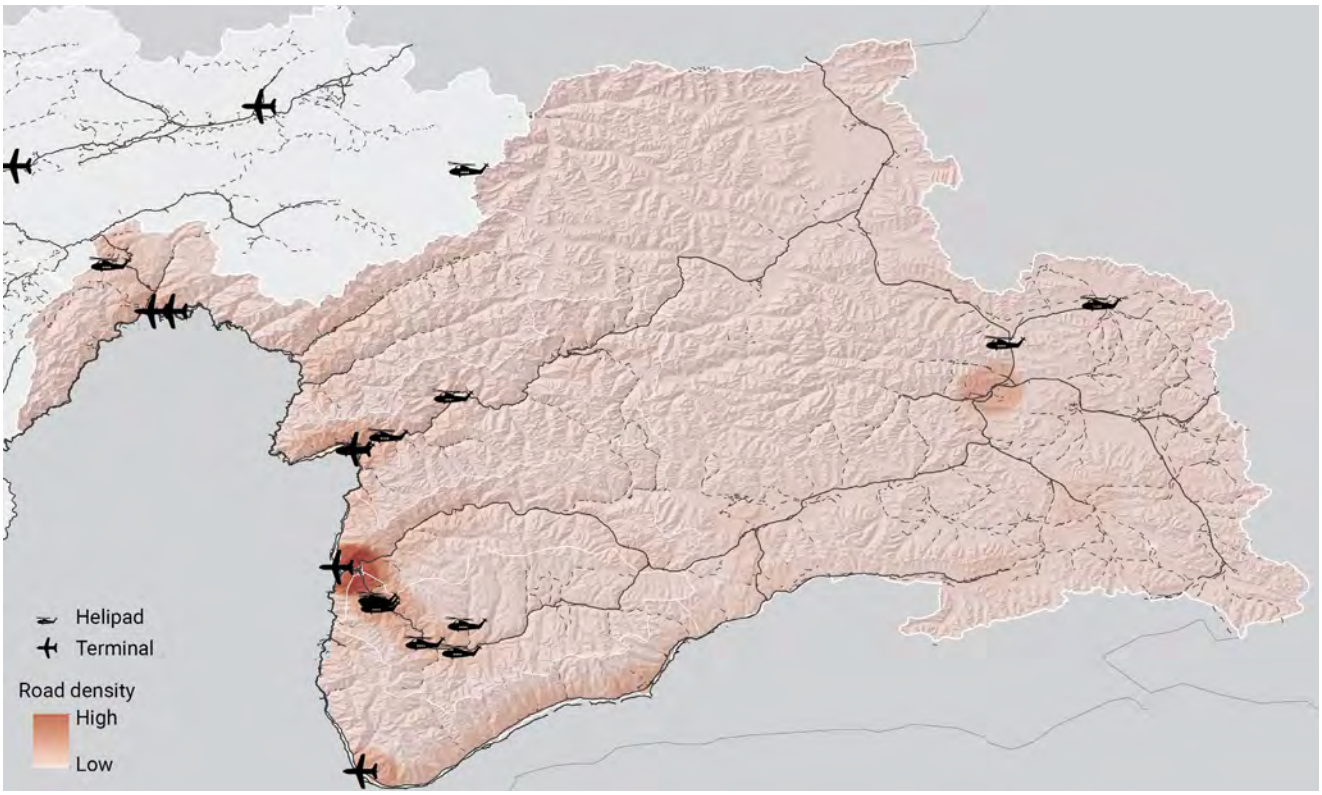


Fig 57. Road density in Tajikistan

Trucks are only allowed through the city before 7am and after 7pm. There is one traffic light in the city, located on the main arterial road entering the city.

Limitations to mobility between Khorog and the rest of the country relate to road quality and maintenance, regular and extreme natural hazards, the length of time required to travel between areas, the cost of travel, and unreliable taxi schedules. Additional challenges associated with the road network are tolls that are often privately operated. Without management of toll costs and administration, road use costs present a barrier to accessibility. Poor transportation is a critical constraint to inclusive growth for Khorog and the region.

There are a number of road and bridge projects that may impact Khorog greatly by increasing accessibility throughout the year. However, there is no integrated planning system for transport infrastructure and a lack of shared mobility assessments to indicate strategic accessibility projects, can lead to inefficient use of resources. The Ministry of Transport has suggested that they are considering 30 road projects (total 2.7 billion USD). The Aga Khan Foundation (through the UCA) has also funded road construction and maintenance, for example a 2.5 km road connecting the Khorog intercity road to Dasht Village.

Air transport is also lacking. Flight services to the local airport are halted as a result of political issues with Tajik Air. When the airport was open, flights between Dushanbe and Khorog accounted for 5% of all domestic travel. These flights relied on passenger numbers and were, therefore, irregular and unreliable. Weather patterns also limited flight numbers and they were expensive (800 TJS). The airplane model in use (an AN28 soviet era plane built between 1975-1993) was also outdated. The airport is now used primarily by AKDN helicopter transfers for government officials, medical staff and AKDN missions. There are two airports in Murgab and Ishakshim but these are only used for emergencies. These challenges make the Tajikistan air transportation network limited and exclusive.

Fig 58. Market area in the central part of Khorog, May 2021

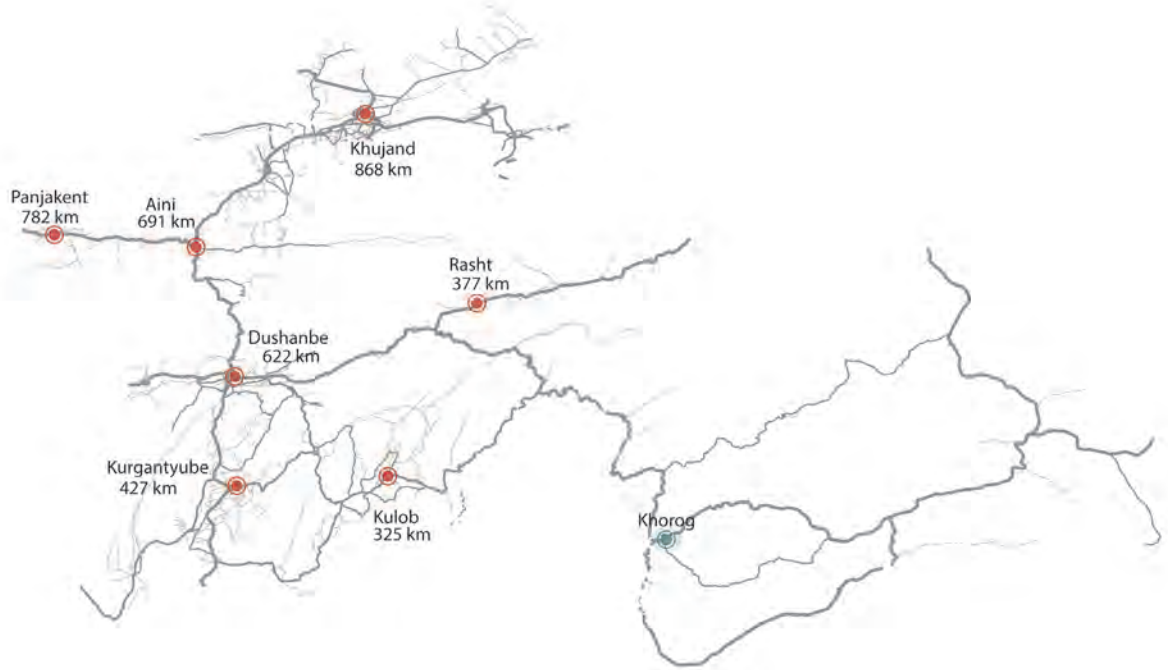


Fig 59. Distances to towns and cities outside of the GBAO from Khorog

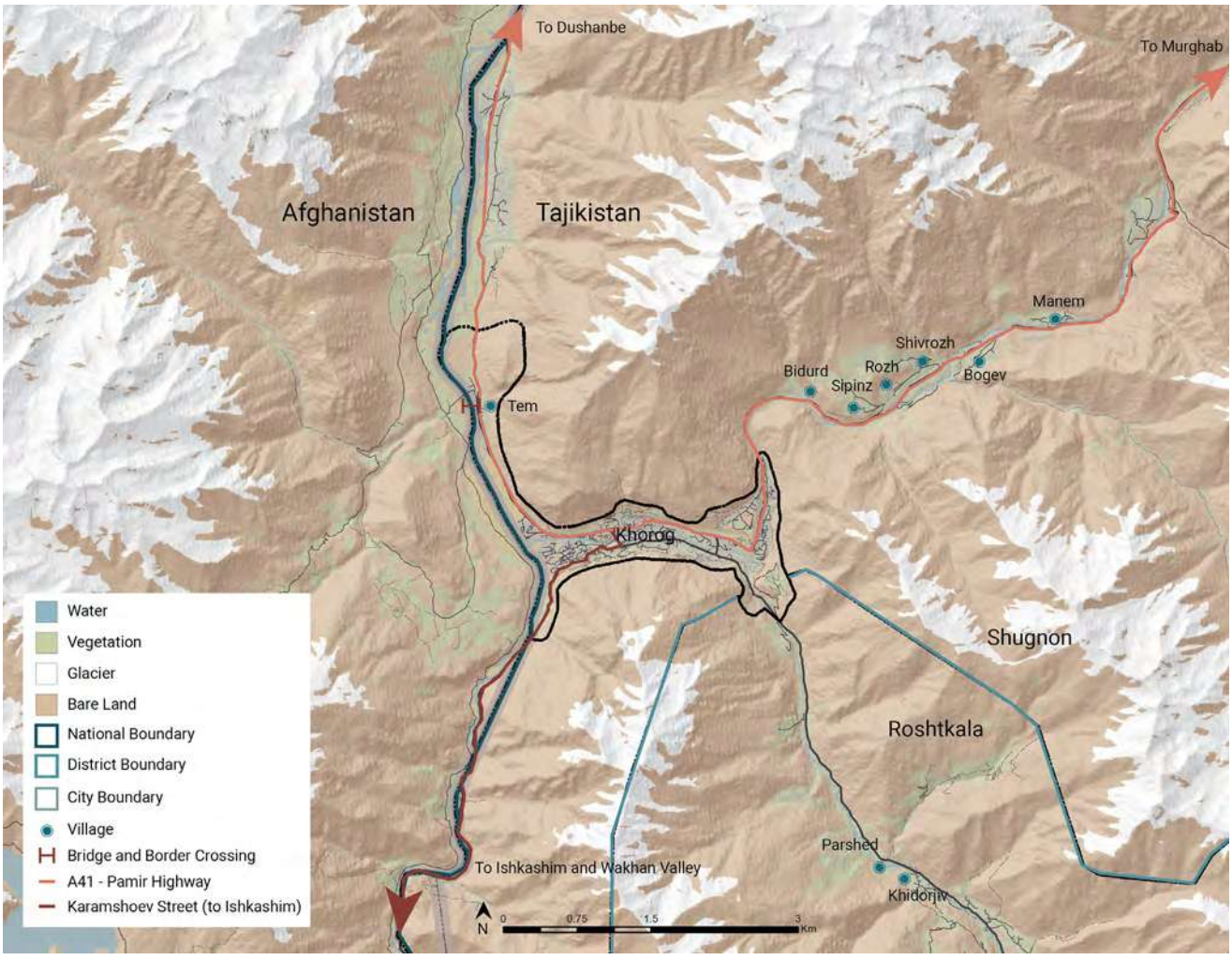


Fig 60. Distances to nearby towns and cities from Khorog

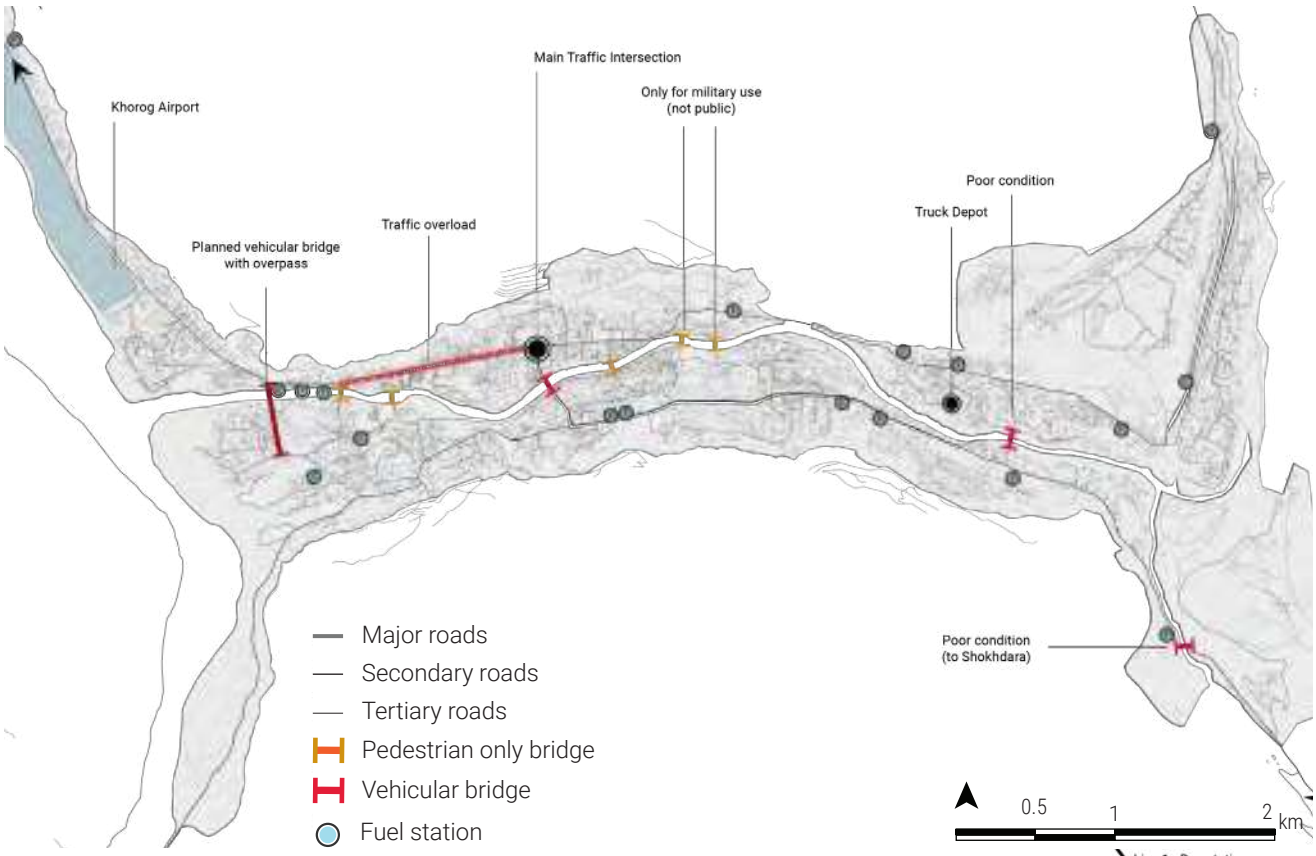


Fig 61. Road hierarchy and bridge access in Khorog

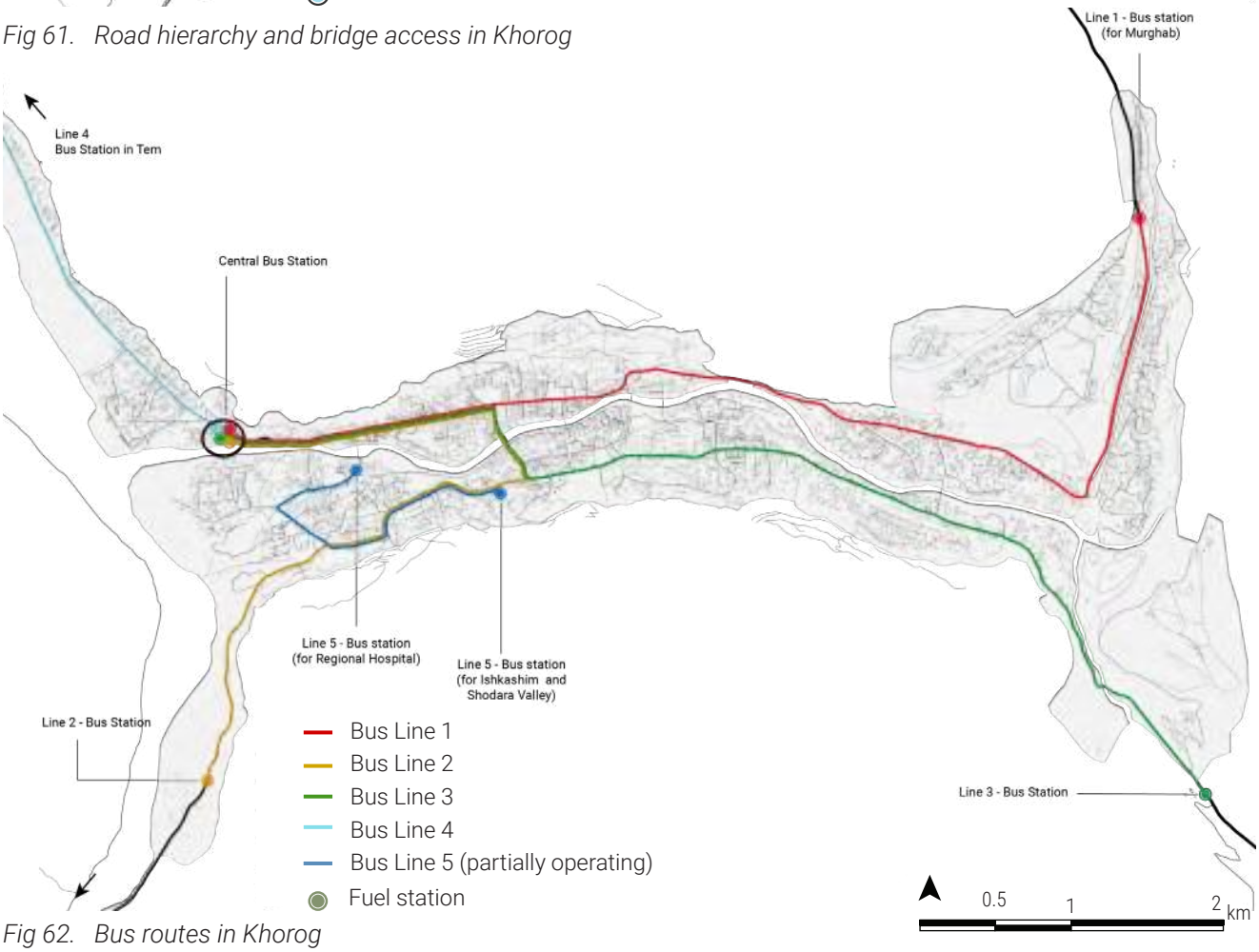


Fig 62. Bus routes in Khorog

5.2.1. Mobility and Connectivity - Planned Projects

While the projects under construction in Tajikistan are largely focused on roads, planned future projects instead focus on railways. These are mostly large-scale, cross-border investments that will increase the country's connectivity with neighbouring markets. They include the Russia-Kazakhstan-Kyrgyz Republic-Tajikistan railway and the China-Kyrgyz Republic-Tajikistan-Afghanistan-Iran railways. Such investment in regional transport is a primary source of broad-based economic growth as they will increase the movement of goods, people and services in the region, and will allow for Tajikistan's greater integration in regional and global value chains.[81]

A summary of road projects that may greatly improve accessibility to Khorog include:

- The Khorog-Kulma section of the Dushanbe-Kulma highway
- Two tunnels in the Dushanbe-Kulyab district and a highway over the 3200m altitude mountain pass to improve goods transport times
- The Wakhan transport corridor, through Tajikistan to China (may be halted due to political disagreement)
- Murghab – Kulma (Chinese border): A Chinese company is rebuilding the highway from the border to Murghab over a 4000-meter pass.[82]

There are a number of bridge projects in the region that may also improve accessibility to Khorog from neighbouring villages. These include:

- Jamoat Yazgulem, Vanch District, over the River of Yezgulem, tributary of Pyandzh.
- Bridge connecting the villages Andarbag and Lyangr in Jamoat Yazgulem, Vanch District across the River of Camochdara, left tributary of Jamoat Yezgulem.
- Jamoat Tekharv, Vanch District, across the River of Vanj, tributary of Pyandzh river.

Sub-sector	Project	Description	Project value (USD million)	Funding source	Status
Road	Kulyab-Kalaikhumb Road Project (Sec-tions A and F)	The project will upgrade two sec-tions of road linking the South-western region of Khatlon with the Eastern Gorno-Badakhshan Autonomous Region. Such a pro-ject will also increase trade with neighbouring countries.	116	ABUDF; IsDB; KFAED; SFD; Government of Tajikistan; OFID	Under Construction
Railway	Karamyk - Vakhdat - Kurgan Tyube - Kalkhazabad - Nizh-ny Pyanj Railway Construction Sec-tion of China – Kyr-gyz Republic-Tajikistan -Afghanistan-Iran Railway	One of the planned new railway constructions that will link China with Iran, crossing Tajikistan, Kyrgyz Republic and Afghani-stan.	2000	Bank of China, Kyrgyz Repub-lic, Tajikistan, Afghanistan, Iran, World Bank, ADB; USA (unspeci-fied)	Planned
Railway	Dushanbe-Osh-Kashgar Railway Construction Sec-tion of Railway sec-tion of China – Kyr-gyzstan-Tajikistan -Afghanistan- Iran Railway	One of the planned new railway constructions that will link China with Iran, crossing Tajikistan, Kyrgyz Republic and Afghani-stan.	1900	MTC of Tajiki-stan	Planned
Road	Reconstruction and rehabilitation Kalaikhum-Khorog-Murghab – Tokhta-mysh road	The project entails the recon-struction and rehabilitation of an 80 km section of road between Kalaihum and Vanj. It will signifi-cantly reduce travel time and cut freight cost by 20%. A prelimi-nary feasibility study was con-ducted by the China Roads and Bridges construction Corporation in 2014.	239	MTC of Tajiki-stan	Planned

Table. 11. .Hotspot projects in the transport sector in Tajikistan related to the GBAO region[83]

5.3. ENERGY, WATER AND SANITATION

5.3.1. Energy

The country's energy is supplied by Pamir Energy, a company established in 2002 by the Aga Khan Fund for Economic Development (AKFED) and the International Finance Corporation, to stop wood fuel use, deforestation, and increased health and natural disaster risks.

The overall quality of Tajikistan's energy infrastructure is poor. Although the country has achieved universal access to electricity, the function of existing systems remains inefficient. The quality of transmission and distribution lead to losses of 17.1%[84] and firms experience upwards of six power outages per month on average.[85]

Tajikistan is a net importer of oil and natural gas. Although also a historic importer of electricity, it has now begun exporting electricity. Despite this, given its connectivity shortcomings and continued dependence on imports of both oil and gas, Tajikistan faces significant energy security concerns. The President has referred to 'energy independence' as one of the government's top priorities for the future development of the country.[86]

In particular, Tajikistan aims to increase its electricity generation capacity to power industrial development and increase exports. It also aims to diversify its sources of electricity away from hydroelectric dams, which currently generate 97% of the country's electricity. Tajikistan's National Development Strategy 2030 names both renewables and coal-fired power plants as possibilities for increased capacity.[87] 94% of electricity generation projects are in hydropower, while coal-fired electric power plants account for only 6% of total electricity generation projects.

The country's dependence on electricity generation from hydroelectric dams leads to seasonal electricity shortages in the winter, leaving an estimated 1 million people without a reliable supply of electricity.[88]

91% of GBAO, equivalent to 216,605 residents and 64,000km in area, has electricity access, supplied by Pamir Energy. Pamir Energy operates 11 hydroelectric power plants in GBAO, with a 9MW hydropower plant and an additional hydropower plant under construction in Khorog. The total capacity is 44.2 MW and electricity transmission lines span 4534 km in the region. Energy for the GBAO region is supplied by Pamir 1 Hydro Power Plant (HPP) built in February 2007, and the Rogun Hydropower Project that was in operation in November 2018. A new Sebzor HP is under construction and has a planned completion for 2023.

However, many plants were built during the Soviet era and require rehabilitation. Rehabilitation projects would help to address the energy deficit during the winter and reduce the imbalance of excess energy supply during the summer months.[89] Stations and transmission lines are extremely susceptible to natural disasters. The majority of Pamir Energy's infrastructure is located within high-risk flooding zones next to the Gunt River. During flooding events, 80% of the GBAO population does not have access to electricity.[90] Additional challenges created by hydropower reliance have been outlined by The World Bank to include limited provision of employment, mass borrowing to finance construction of the plant and the need for financial management and maintenance plans in relation to production capacity.[91]

The cost of supply is also a challenge for both Pamir Energy and for the local community. The cost of electricity is 30-40% higher in Khorog than in the capital city, Dushanbe. Pamir Energy is subsidized by the national government and due to the topographical and climate challenges, there are no alternative utility companies in the country. The process for all Pamir Energy infrastructure projects involves a feasibility study which is shared with the national government, to obtain a 'no objections' permit. Once land allocation is agreed, environmental and financial sustainability are considered.

Khorog itself suffers from energy outages, notwithstanding occasional energy surpluses, even in winter time. Pamir Energy collects data on peak loads which occur twice a day (between 7am-10am and 4pm-7pm). Measures to ensure supply consistency are being considered, such as night storage heaters in major public facilities that can be switched off, and energy storage facilities. These interventions aim to accommodate current demand until the Sebzor plant is complete in 2023.

Pamir Energy also aims to connect areas between Khorog and Ishkashim, for which they will begin a new powerplant project (Sanovbod) and construct a solar PV plant and wind farms. Areas outside of the urban boundary of Khorog are being considered as potential sites for the deployment of these renewable projects that will reduce energy dependence on water sources. The Khorog Medical Clinic has also appropriated land for a solar PV plant of 5mgv.

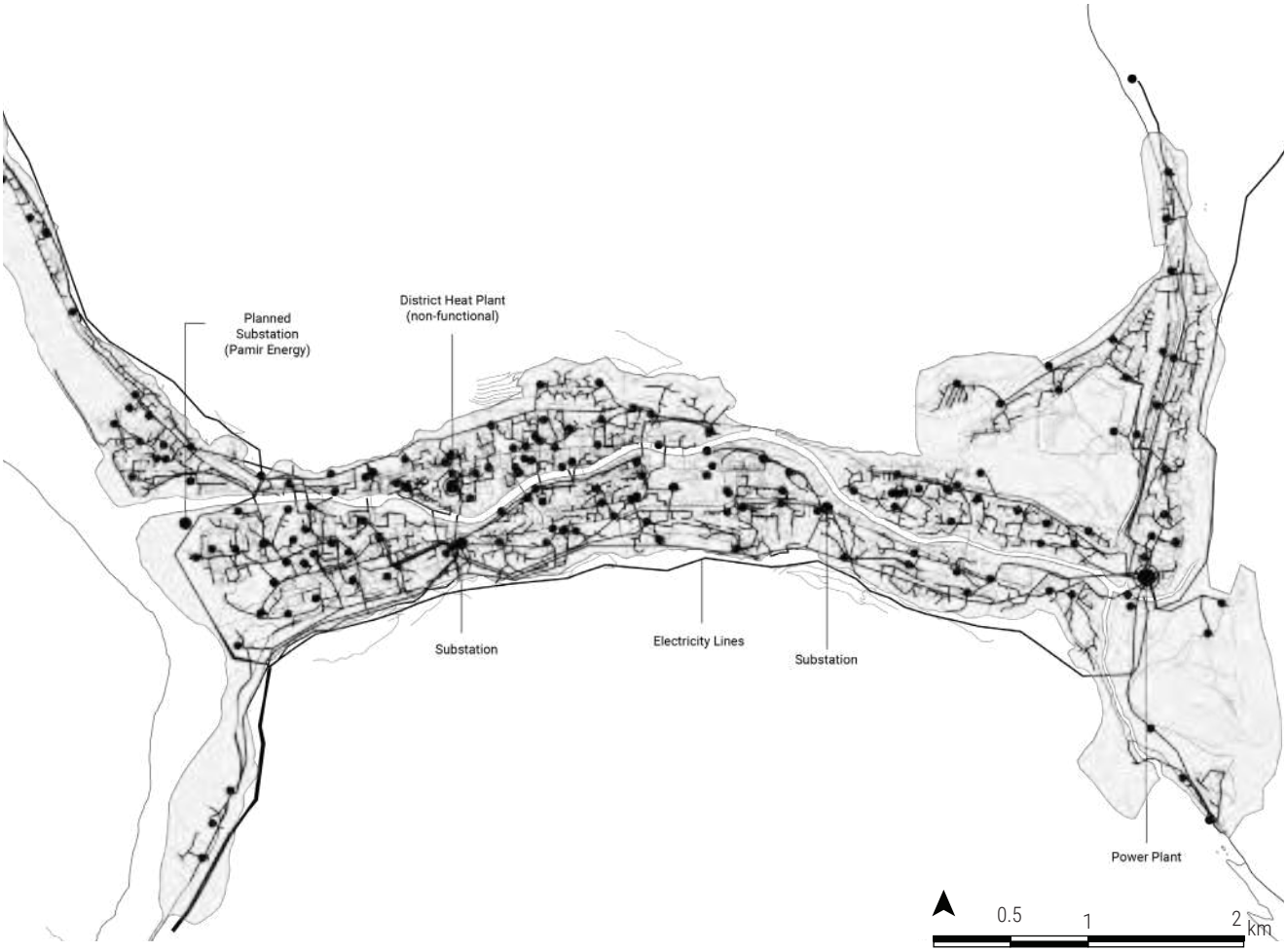


Fig 63. Electricity infrastructure

Fig 64. A house in Imomobod, May 2021

Private or unplanned development in Khorog may present a hinderance to energy supply. Connecting unfamiliar construction to the uniform city infrastructure is considered a technical challenge. Notwithstanding Pamir Energy's forecasting of energy capacity needs, unplanned buildings can deter accurate assessment and supply.

5.3.2. Energy - Planned Projects

Tajikistan is participating in externally funded oil and gas pipeline and electricity transmission projects. An example of this is the World Bank-funded Central Asia - South Asia Electricity Transmission and Trade Project (CASA-1000), which will help Tajikistan and the Kyrgyz Republic to export summer surplus electricity to neighbouring Kazakhstan, Uzbekistan, Afghanistan and Pakistan. When realized, the project is expected to integrate the electrical networks of Central and South Asia. Tajikistan is poised to benefit considerably from increased electricity exports posed by this project, spurring additional development in the country.[92]

5.3.3. Water Supply

Despite abundant water resources, Tajikistan uses only 20% of the available water potential[93] and only three out of four people have access to a clean water source.[94] Moreover, the irrigation infrastructure is mostly deficient; approximately 50% of the water distribution system and 65% of the drainage system is considered dysfunctional.[95] Although Tajikistan has made gains in access to drinking water, particularly in rural areas, the country still lags behind comparative economies.[96]

It is certain that climate change and the increase in extreme weather events will negatively affect the capacity of existing drinking water infrastructure and access to adequate sanitation.[97] Therefore, there is a substantial need for investment to rehabilitate or replace the country's outdated water supply and sanitation infrastructure[98] and the financial requirements for this may increase in line with predicted impacts of climate change, especially in reference to water supply. Only 59% of the country's population (both in urban and rural areas) had access to a public water supply in 2015.[99]

Water is available in all villages in GBAO but often of unsatisfactory quality and low quantity. This is due to the major seasonal fluctuations of river water levels. In Eastern Pamir, water infrastructure consists of wells for drinking water and basic seasonal canals for irrigation in the summer. In Western Pamir, drinking water is taken directly from rivers or from springs, as well as irrigation canals.

Deteriorating Soviet-era infrastructure such as irrigation channels, roads, dams, bridges and river embankments have increased the population's exposure to risks associated with extreme weather events and earthquakes.[100] Three-fourths of the population of GBAO lack household access to toilet facilities, sewerage networks and direct water access.[101]

The lack of household access to a sewerage system and unreliable electricity supply are the largest contributors to multi-dimensional poverty at the national level and is exemplified in Khorog. Water pipelines do not reach all urban areas which may be a consequence of land registration and governance that lead to unpermitted development, or of the scale of intervention required to upgrade the existing network. Critical water sources may be unreliable or strained, due to shared use and management between Khorog and urban areas upstream, as well as resource ownership discrepancies between Afghanistan and Tajikistan.

Sub-sector	Project	Description	Project value (USD million)	Funding source	Status
Energy	Electric power transmission and distribution	CASA-100 is a regional project for the construction of a power transmission line between Tajikistan, Afghanistan, Pakistan and the Kyrgyz Republic. The Tajikistan portion of CASA-1000 is a 170-km transmission line from North to South, covering some 60 villages.	1 170	Governments of Kyrgyz Republic, Tajikistan (Ministry of Energy & Industry), Afghanistan, Pakistan	Under Construction
Energy	Anderob Power Plant	The project aims to overcome the current electricity shortages in Tajikistan and meet the growing electricity demand. It will contribute towards achieving SDG 7 (to address electricity shortages) and SDG 8 by creating employment for around 16 000 people.	1 300	n/a	Planned

Table. 12. Hotspot projects in the energy sector in Tajikistan related to the GBAO region[103]

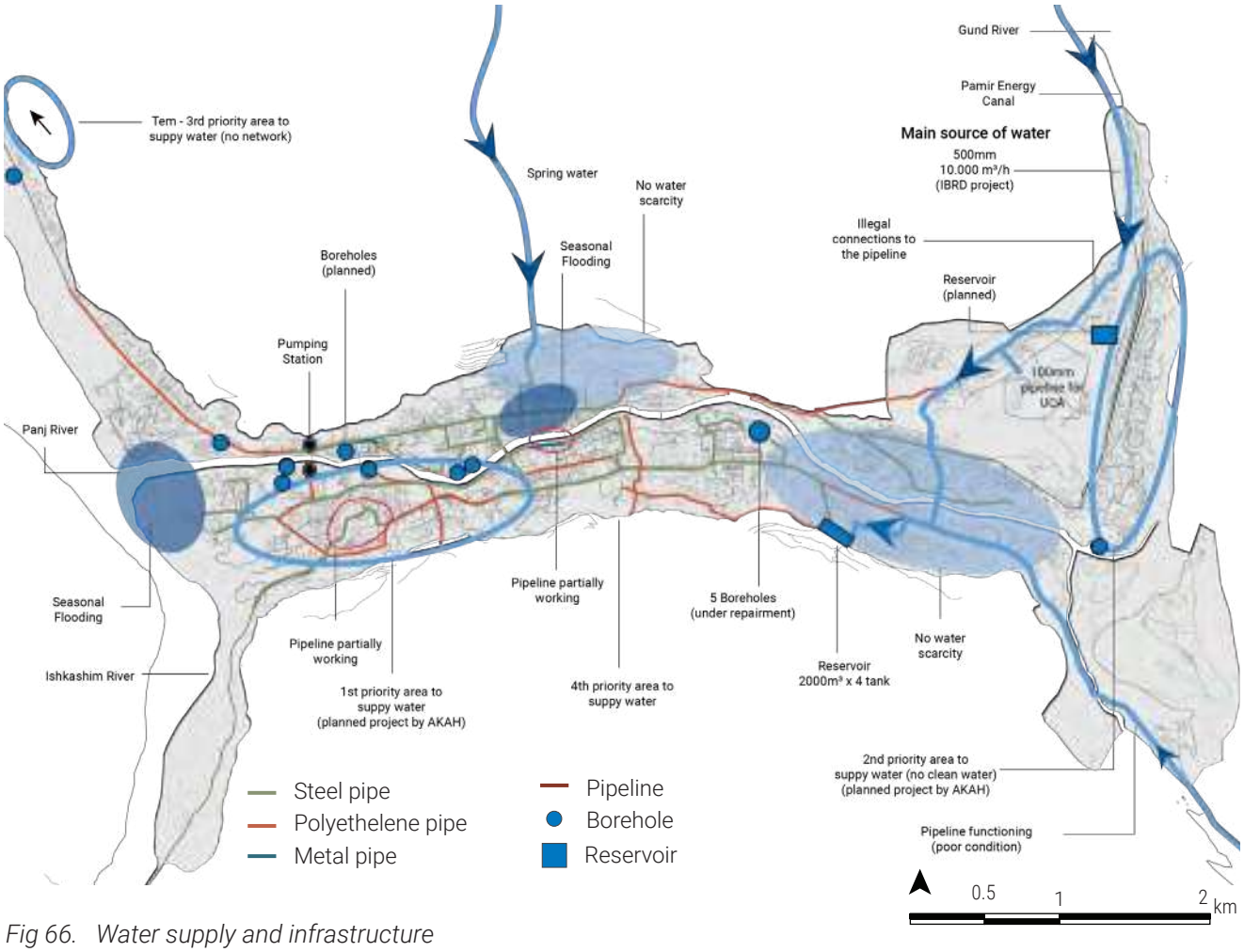


Fig 66. Water supply and infrastructure

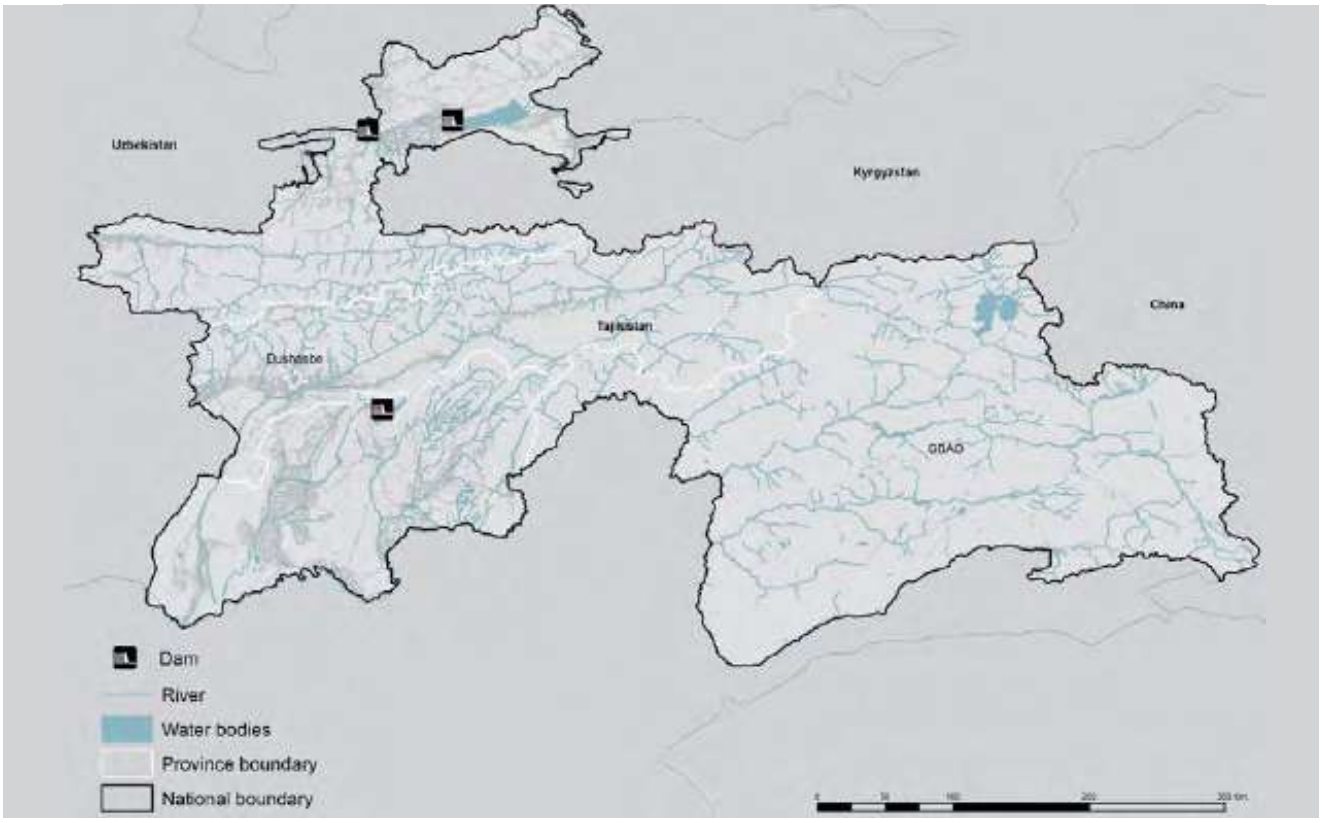


Fig 65. Rivers, waterbodies and dams

The main water source for Khorog is the Pyandzh River. The river collects the waters of the Badakhshan and Gharategin highlands, irrigates a network of cotton plantations in Kulab and Qurqanteppe, and feeds the Aral Sea. The Gunt and the Shakhdara rivers meet on the Eastern side of Khorog and flow through the town, joining with the Pyandzh river in the West. The town is divided into North and South sections by the river. The Temur canal is located North of the town and is fed by run off from the mountains.

The capacity of existing water pipelines is 830 m^3 per day, fed by three main pipelines; Bogevdara, Siyob and Khufak, listed in order of size. The smaller two are of low quality, built 20-30 years ago of cast-iron. The total supply length of these is 24km, which are in addition to the main town main pipeline which covers 56km. The smaller pipelines feed this central line, which was built between 1970-1990 and is also of poor quality. Whereas these older pipelines range from 50 to a maximum of 250mm in diameter, the newest Bogevdara line was built in 2014-15 from plastic and has a diameter of 200 to 800mm, creating a much higher capacity.[102] This line was funded by Eurobank and SECO.

All water pipelines in Khorog were updated through The European Bank for Reconstruction and Development (EBRD) in 2015. A second phase of pipeline construction is underway, using a loan of USD 2 million provided to the Khorog Water Company and its owner, Khojagii Manziliyu-Kommunali.

Notwithstanding these improvements, there is a large amount of wastage from poor pipeline quality - in some areas up to 90%– and informal use. Irrigation is sourced from the Pamir Energy Canal, the Bidurd Canal, and Temur Canal. In the Khufak neighbourhood, water for irrigation is taken primarily from the Khufak Dara. The Boh Dara water supply, totalling 10,000m^3, is sufficient for the whole city, however, due to unmonitored, informal use, there remain water shortages in the city.

The cost of drinking water, waste disposal, pasture and irrigation services are set and approved by the State Subsidiary Enterprise of Water Supply and Sewerage, SUE "Public Utilities" and Main Department of "Tojikobdehot". Water meter systems are found only in institutional buildings in Khorog, not homes and therefore, the water consumption rate is unknown. However, the estimated average litres per person per day and tariff rates on drinking water supply services for SUE "Public Utilities" for 2018-2019 are listed in table 13. These tariffs indicate that the price of water for many households in Khorog will exceed income levels.

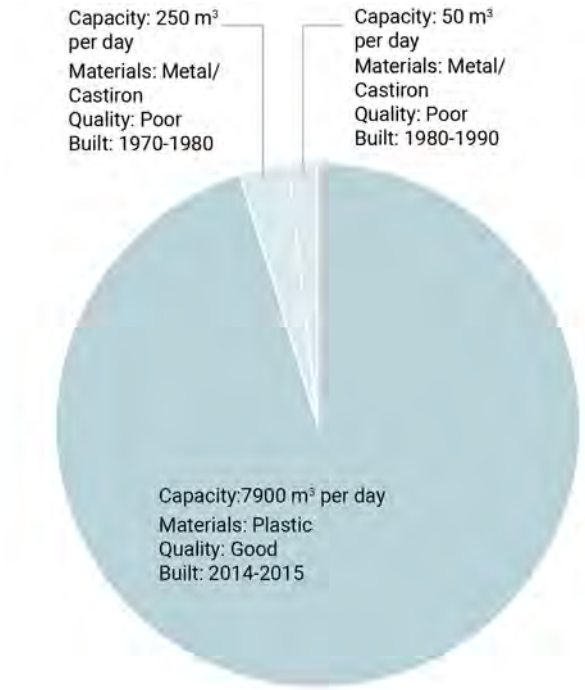


Fig 67. Water Capacity in Khorog

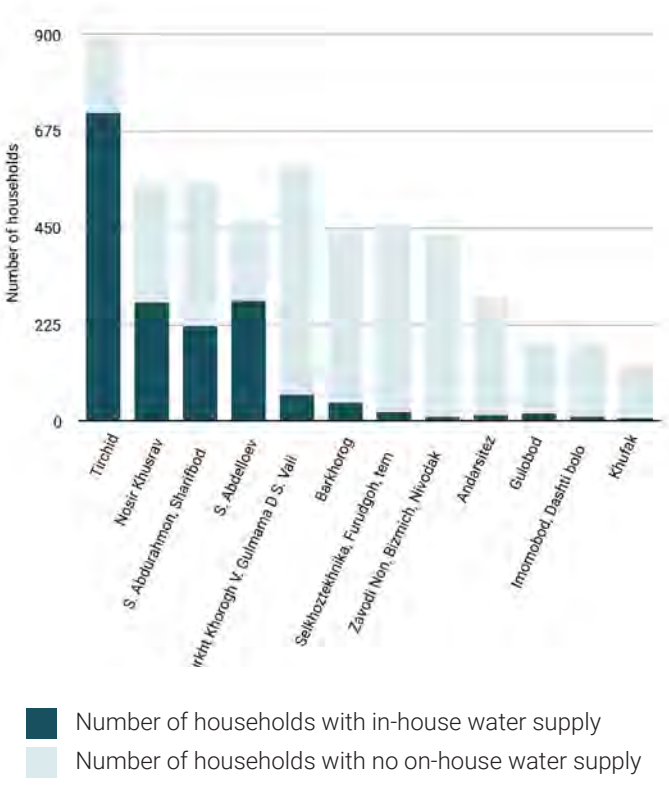


Fig 68. Number of households per neighbourhood with water supply

No-longer functional pipelines in the city are:

- Microdistrict N. Khusrav lower part, diameter 250mm, Steel
- Microdistrict Barakat area, lower part of Bizmich, diameter 100mm, Steel

Pipelines that have been recently updated are:

- Microdistrict S. Abdullo, Agricultural machinery section, diameter 200mm, Polyethylene (not yet connected)
- Microdistrict N. Khusrav, diameter 160mm, Polyethylene
- Microdistrict Tirchid, area UPD, diameter 0.80mm, Polyethylene
- Detachment 0410, diameter 100mm, Polyethylene
- Microdistrict Tirchid, a section of a ZhBK bridge, diameter 300mm, Polyethylene
- Bogevdara - Khorog, diameter 500mm, Polyethylene

Remaining pipelines include:

- Microdistrict Barkhorog, diameter 150mm, Steel
- Microdistrict Barkhorog, area Tuberculosis hospital, diameter 150mm, Steel
- Roshtkala District Shod village (Siyob) - Khorog, diameter 200mm, Steel
- Section UPD - Bakery, diameter 400mm, Steel
- Section UPD - Bakery, diameter 150mm, Steel
- Section Hlebzavod - Bizmich, diameter 300mm, Steel
- Microdistrict Tirchid site Archive, diameter 150mm, Steel
- Microdistrict N. Khusrav, diameter 100mm, Steel
- Microdistrict N. Khusrav - Microdistrict S. Abduravkhmon, diameter 250mm, Steel
- Microdistrict Barakat - ZhB Bridge, diameter 300mm, Steel
- RC Bridge - S. Abduravkhmon Bridge, diameter 200mm, (material unknown)
- Microdistrict Khochordev - Microdistrict Sh.Shotemur, diameter 150mm, Steel
- Microdistrict Khufak - Microdistrict Khochordev, diameter 150mm, Steel

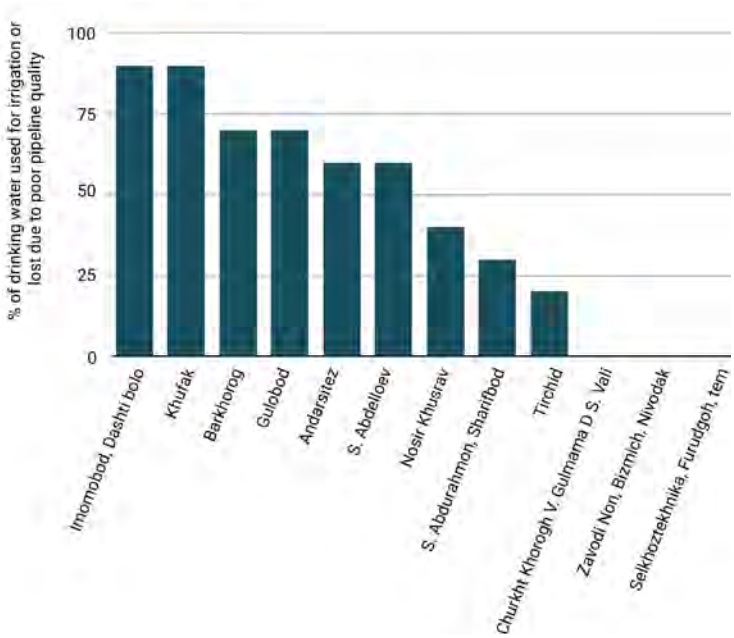


Fig 69. : Dynamics of drinking water use / loss

Water Consumption [1]	Liters per person per 24 hours	Price per month per person (in TJS)	Approximate price per household of 5 per year
Street water pipes	50	1,95	
Yard water pipes	95	3,70	
Internal water supply and sewerage	130	5,07	420

Table. 13. Consumption and price of water per person in Khorog

5.3.4. Water - Planned Projects

Current and planned water projects amount to approximately USD 258 million in investment cost and are mostly focused on water supply, irrigation and management. Relevant investments include climate resilience projects such as flood and mudflow protection infrastructure, as well as irrigation and drainage infrastructure. Such investments are expected to boost crop yields and increase food security for local inhabitants.[104]

A range of international development partners have committed to actions both to improve water supply and to strengthen climate resilience in the country, including GBAO, such as those under the Pilot Program for Climate Resilience (PPCR). The project "Increasing Climate Resilience through Drinking Water Rehabilitation in North Tajikistan" aims to invest in facilities related to drinking water conservation and use, the rehabilitation of drinking water supply, and also to support awareness-raising activities. The project was also designed to enhance the capacities of water companies and city authorities in the selected cities.[105] The European Bank for Reconstruction and Development (EBRD) also provides support for the improvement of local authority water management, both financially and operationally.[106] [107]

AKAH, with financial support from the Government of Switzerland, initiated an upgrading program for the Municipal Water Supply System in Khorog, which involves connecting water pipelines with central city mains to improve access to drinking water in the centre of the city. Furthermore, a Eurobank and SECO funded project is planned to implement a new pipeline of 14km to areas of no access, which include Khlebzavod, Bizmach, Nivodak, Selkhoztekhnika, the airport, and Tem.

5.3.5. Sanitation

Sewage systems in Khorog are of poor quality. The wastewater reservoirs and sewage pumps were built between 1970-1980 and the main sewage line, which stretches 30km, was built between 1970-1990. The wastewater reservoirs have a capacity of 8000 m^3 and were recently renewed. A large portion of the city has no access to the sewage system and therefore, rely on public toilets and septic tanks. Dumping sites throughout the city consist of brick, open spaces. Refuse from these sites are then transported to a landfill 14 km south of the city.

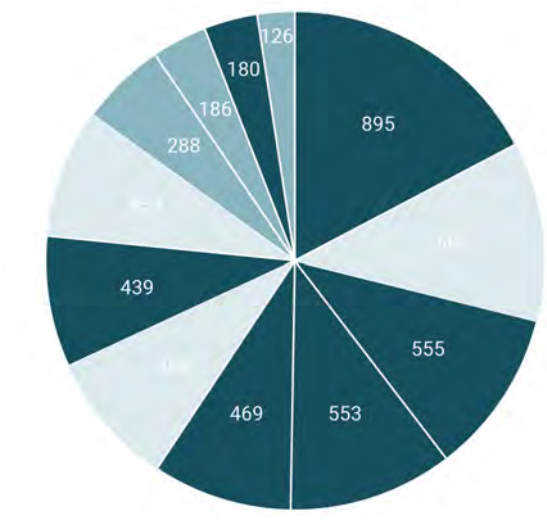


Fig 70. Number of households per neighbourhood with sewage system access

Sewerage	Liters per person per 24 hours	Price per month per person (in TJS)	Approximate price per household of 5 per year
Street sewerage	50	1,95	
Yard sewerage	95	3,70	
Internal water supply and sewerage	130	5,07	240

Table. 14. Consumption and price of various sewerage systems in Khorog

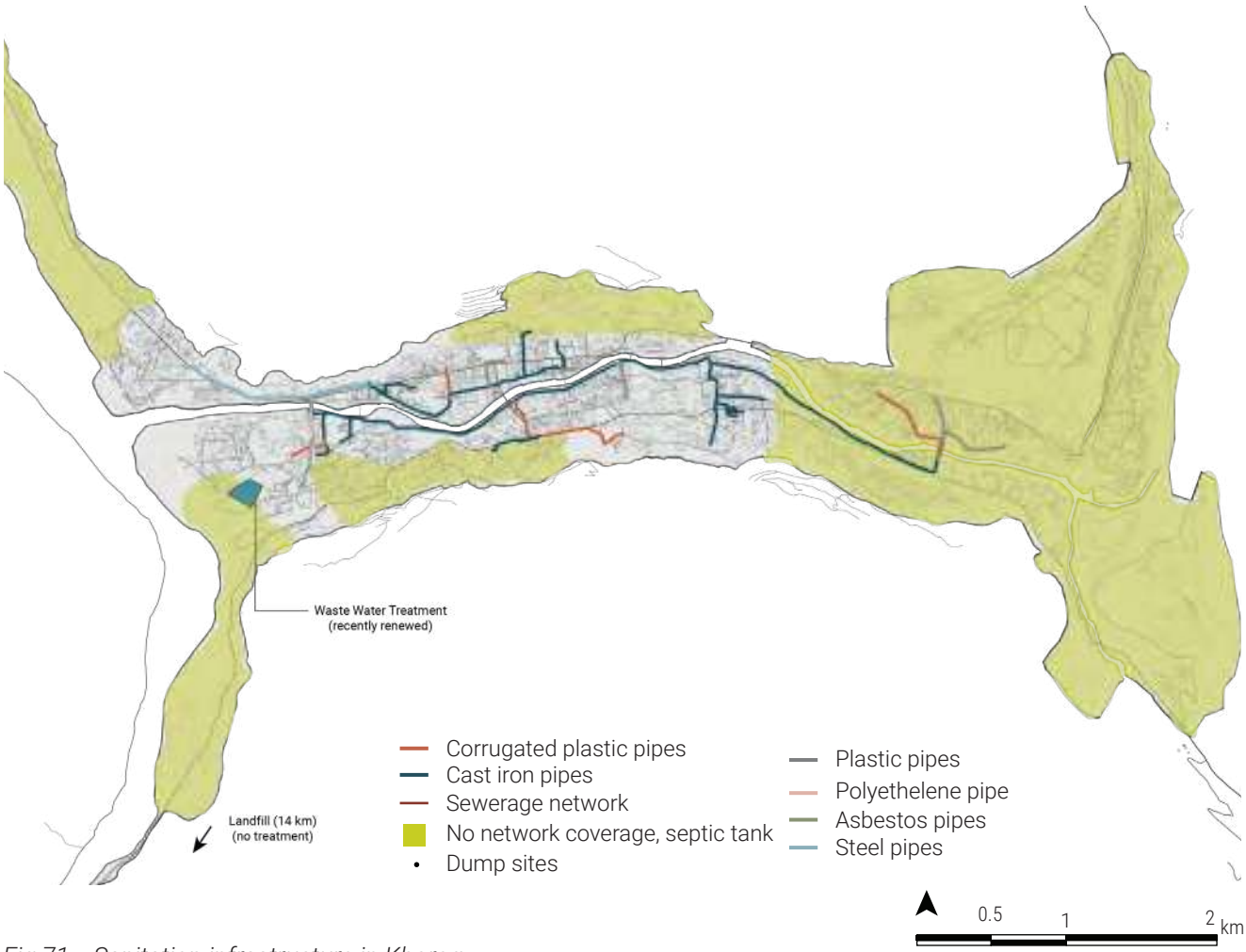


Fig 71. Sanitation infrastructure in Khorog

Fig 72. A house in Andarsitez, May 2021

5.4. COMMUNICATIONS AND DIGITAL INFRASTRUCTURE

Information and communication technologies (ICT) play an essential role in reducing the distance to markets and in integrating urban centres. In countries with geographic disadvantages like Tajikistan, ICT can dramatically reduce the need for travel and transportation. There are wide disparities in access to landline telephones between urban and rural areas but mobile access is relatively equal. However, only 3.5% of households in Tajikistan have direct internet access, most of them in Dushanbe and other urban areas. The Tajik domestic broadband backbone also compares poorly to that of its neighbours, covering mainly densely populated areas in the country's West and leaving out sparsely populated mountainous areas such as GBAO.[108] The number of individuals using the internet increased from 11.6 per 100 inhabitants in 2010 to 22 per 100 inhabitants in 2020.

Landline telephone subscriptions likewise vary widely among regions and across urban and rural areas. Because individual telephone needs are increasingly met by mobile services, landline subscriptions should not be considered the only measure of communication services availability. Even so, landline subscriptions are still a reasonable indicator of formal business activity in a given area. Landline subscriptions in the GBAO, however, likely reflects the fact that the small population of its vast mountainous region isn't adequately served with cellular coverage. Despite this, the overall level of telephone access is not a critical constraint to inclusive growth in Tajikistan.[109]

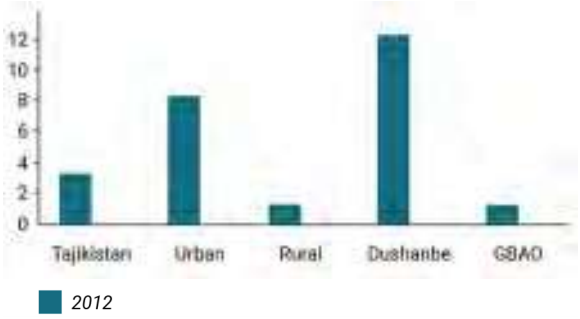


Fig 73. Internet connection, 2012 (% of households) [110]

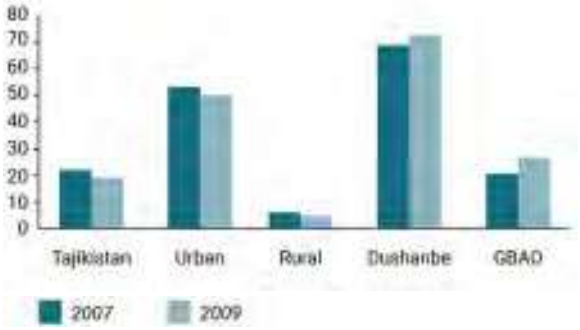


Fig 74. Landline Telephone Ownership, 2007 and 2009 (% of households)[111]

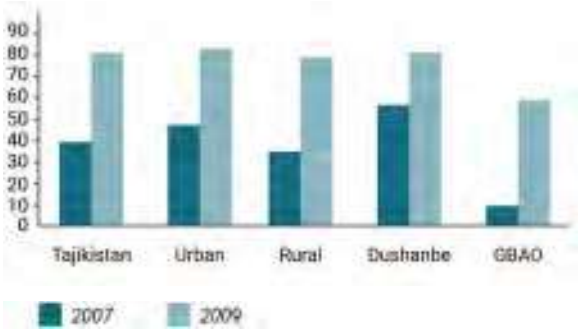


Fig 75. Mobile Phone Ownership, 2007 and 2009 (% of households)[112]

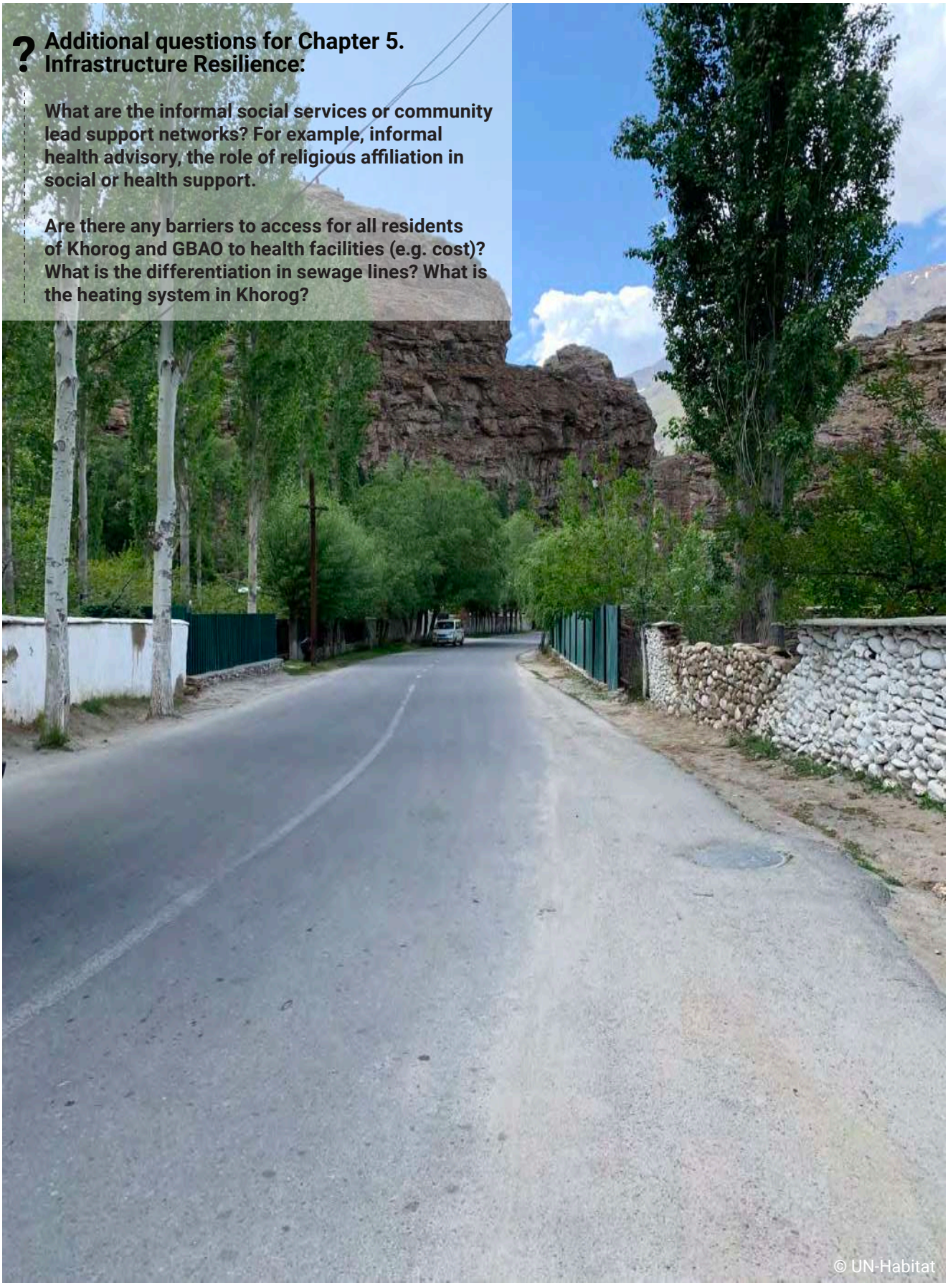


Fig 76. A road in Andarsitez, May 2021

Fig 77. A house in Andarsitez, May 2021

6

SPATIAL AND ENVIRONMENTAL RESILIENCE

6.1. BLUE-GREEN NETWORK

6.1.1. Land Cover

Due to climatic conditions and topography, GBAO has negligible endowments of cultivable land.[113] The land cover in the Tajik Pamirs is largely dominated by the category of "bare soil & rock surface", which accounts for approximately 65% of the total area of Gorno Badakhshan. Irrigated lands are scarce in GBAO, with 1522 hectares of irrigated lands in Vanj, 4426 hectares in Ishkashim and 2121 hectares in Shughnon, which receive water from the Gund and the Panj Rivers. [114]

Khorog is characterized by steep rocky slopes, vegetation within the urban boundary, tree lined streets and the main water bodies of the city centre. Irrigation channels are also found throughout the city. These are open, concrete channels which often become blocked by debris that causes water leaks and underground flooding.

It is common for houses in Khorog to have small plots of land which are usually used for agriculture. Due to the steep slopes, getting agricultural water services to the mountain sides is a challenge. The land in the West of the city is regularly flooded and the soil is sandy, which poses limitations to development in the area. Public spaces are predominantly maintained by local communities. The botanical gardens not only function as a park but also as a centre for research on local plant species.

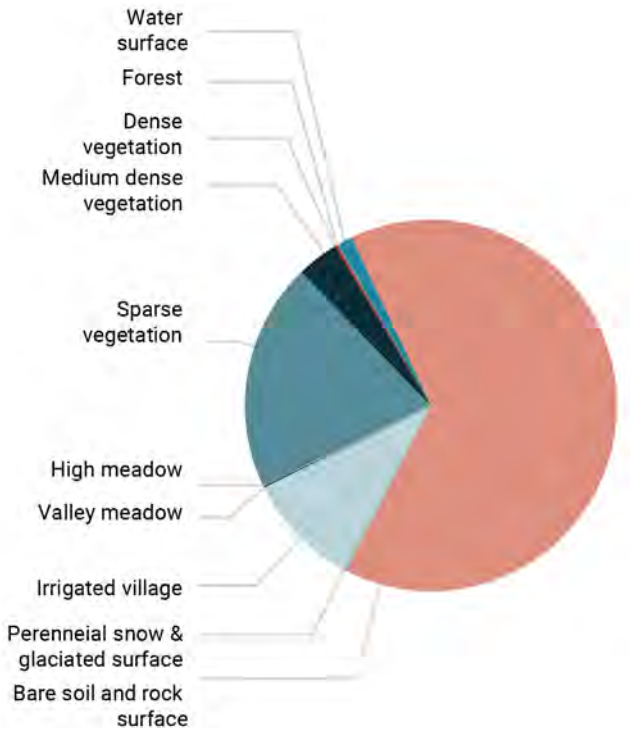


Fig 78. Land cover distribution in GBAO[115]

6.1.2. Forests and Wild Nature

Forests account for only 3% of the land area in the country. Still, they play an essential role in the conservation of biodiversity and atmospheric carbon absorption. In addition, the forests provide natural protection for human settlements against floods, avalanches, and soil erosion.[116]

Since the 1930s there has been intensive reclamation of foothill and floodplain valleys to increase the area of arable land in Tajikistan. In this process, up to 100 thousand hectares of floodplains and forests were destroyed. In particular, the economic and energy crisis in the early 1990's led to major deforestation. Deforestation and animal grazing in forest areas has harmed the quality and diversity of forests and has halted their natural regeneration.

Despite this damage, the flora in Tajikistan is rich and diverse. The wide area of Tajikistan and its neighbouring countries is considered a significant territory of world biodiversity. However poaching and illegal collecting and selling of natural resources, pollution and fragmentation of ecosystems together with the increasing impacts of climate change, threaten this unique environment.

The Tajik National Park in GBAO's Pamir Mountains (a UNESCO World Heritage Site), occupies an area of 26,000 km^2 or 18% of the total area of Tajikistan. Taken together with Jirgital and Sangvor Districts of Republican Subordination (DRS), these sites give Tajikistan one of the most significant landscapes in the world.

There are no natural reserves or conservation areas within or in close proximity to Khorog. However, vegetation is still integrated within the urban boundary of the city and fulfils and important role in hazard mitigation, air quality, shade provision in the hot summer months, reduction of soil erosion and ground flooding absorption.[117]

6.1.3. Glaciers and Water Resources

Tajikistan's water resources are formed from glacial meltwater, frost and seasonal snow cover in the Pamir mountains. These sources feed the agricultural water supplies and power the turbines of hydropower stations. The reduction in glacier runoff enhances the risk of droughts, challenges food security and results in degradation of aquatic ecosystems that can cause damage to both the economy and the population. Glaciers and mountain ecosystems are abundant in Tajikistan and not only serve as water reservoirs and streamflow regulators but also feed the Aral Sea river basins.

The glaciers of the Pamirs are part of the Tajik National Park, which covers more than 8,000 km^2. Runoff from these glaciers feed the Amu Darya and other river systems, which are vital to agricultural activities, drinking water, fisheries and hydropower.[118] The park also includes lakes such as Karakul (364 km2), Sarez (88km2), and Yashilkul (35.6km2).[119]

GBAO has many rivers and streams that originate in the Tajik National Park. The Amu Darya River Basin covers large parts of the region and extends beyond, to other parts of Tajikistan, Kyrgyzstan, Afghanistan, Uzbekistan and Turkmenistan. Panj river, a principal contributory of the Amu Darya river, is a major water artery in GBAO and serves as a natural border between Tajikistan and Afghanistan.

The process of deglaciation and seasonal shifts in river levels influence water availability in the region. As a result of deglaciation, river levels are expected to drop more generally, especially during summer when water is most needed for agriculture. Problems that this may present to potable water supply will become an additional burden on the population, considering that people residing in the Western Pamir sub-region of GBAO and Khorog take their drinking water directly from the rivers. Reduced availability and differing quantity could result in water conflicts in villages, posing further risks to socio-economic stability.

Year	2010	2015	2020
Threatened species (number)	40	41	48
Forested area (% of land area)	2.9	3	3
CO2 emission estimates (million tons/tons per capita)	2.3 / 0.3	4.2 / 0.5	5.8 / 0.7
Important sites for terrestrial biodiversity protected (%)	15.8	16.8	16.8

Table. 15. Environmental features over the years in Tajikistan [120]

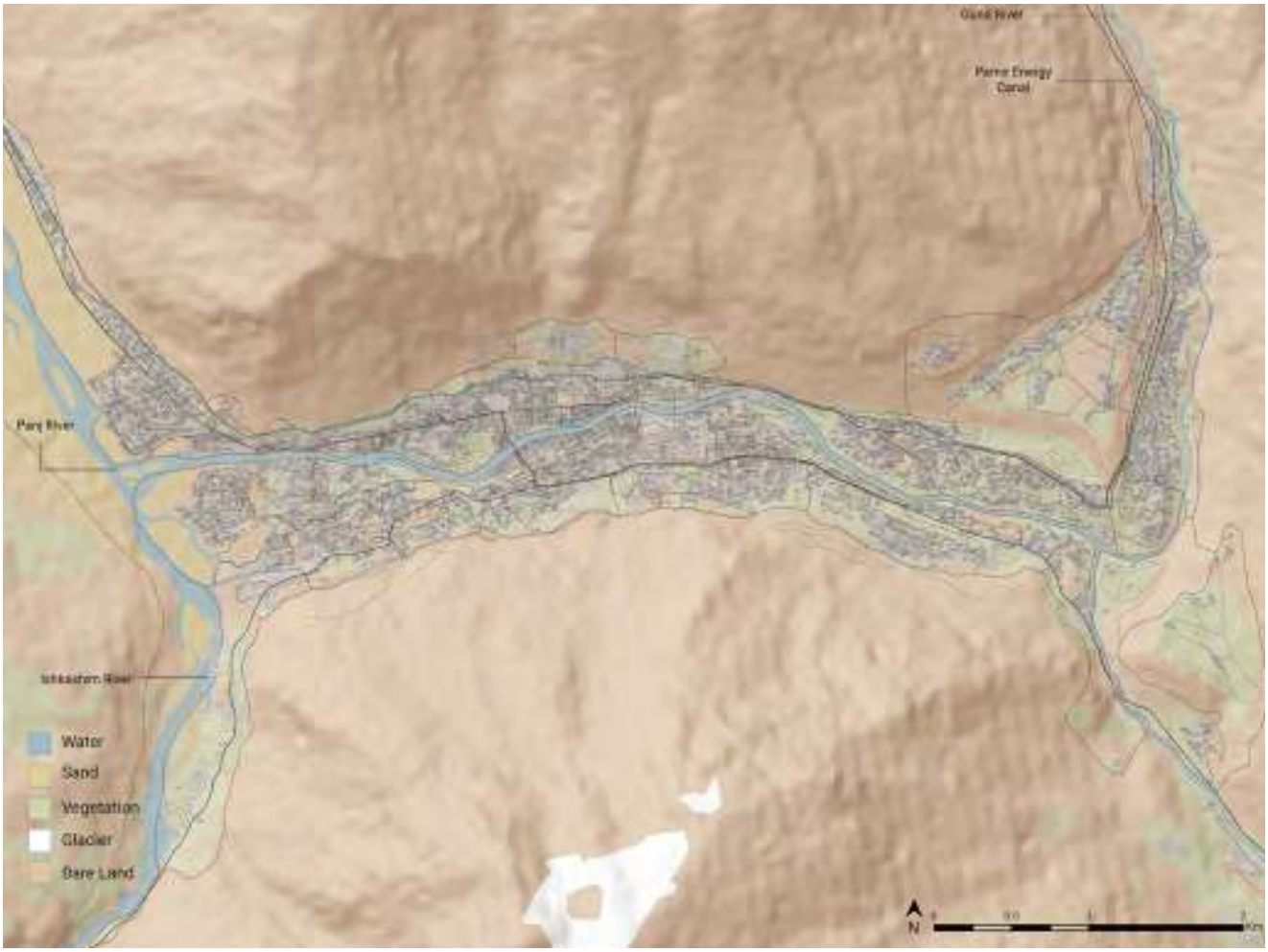


Fig 79. Blue and Green Network in Khorog

Fig 80. Landcover of GBAO

6.1.4. Green and Public Space

Green space plays a number of vital roles for the city of Khorog. Not only are they multifunctional areas for social interaction, human health and well-being, but they are also spaces for cultural expression and dialogue, that improve climate change resilience and mitigation from hazards. Green spaces have a cooling effect on the city in summer, reduce flooding, erosion, and, if it forms a significant border area with adequate planting, can protect against rockfalls, landslides and avalanches. Green spaces are a form of nature-based solution to climate change adaptation and mitigate in their capacity as carbon sinks. Such spaces also can be used as emergency evacuation or 'safe spaces' or can be adapted for other temporary purposes.

When considering the role of green areas in Khorog, it is necessary to understand the specifics of the city, which, being surrounded by mountains,[121] also has green forest plantations in the river gorge. These are considered an important part of public open spaces and common services, and can serve as a means of promoting the health of all members of the urban community[122].

The City Park established by the Aga Khan Trust for Culture and constructed between 2005 and 2009, is the largest park in the city and includes toilet facilities, an open air theatre, ice rink, swimming pool, restaurant, and tea house. The design inspiration for the park was a direct response to the dramatic landscape and climate of the region, and the common need for a public garden for both refuge and recreation.[123] The park has become an integral part of circulation through the city and represents a vital step towards the revitalization of Khorog as a whole.

The Botanical Garden was founded in 1940 to test survival rates of different plants in the conditions of the mountain climate. Over 3,000 kinds of plants were tested. However, the garden is located 5 km to the East of the city centre, which makes it comparably less accessible. Its positioning on higher ground provides a panoramic view of the whole city. In comparison to the city park, there is less programming in this space.[124]

Additional green space can be found in public areas dedicated to monuments, the Ismaili Center, the UCA campus, and public authority buildings, however, this ground is privately owned. There are additional programmed public spaces, such as marketplaces and bus and taxi terminals. The city is covered with trees and landscaping is integrated into the urban fabric of the city. Smaller plots of land that are unused may be informally used as public spaces, and school fields can also be used by the wider community.

Fig 81. A pedestrian bridge in the central area of Khorog, May 2021

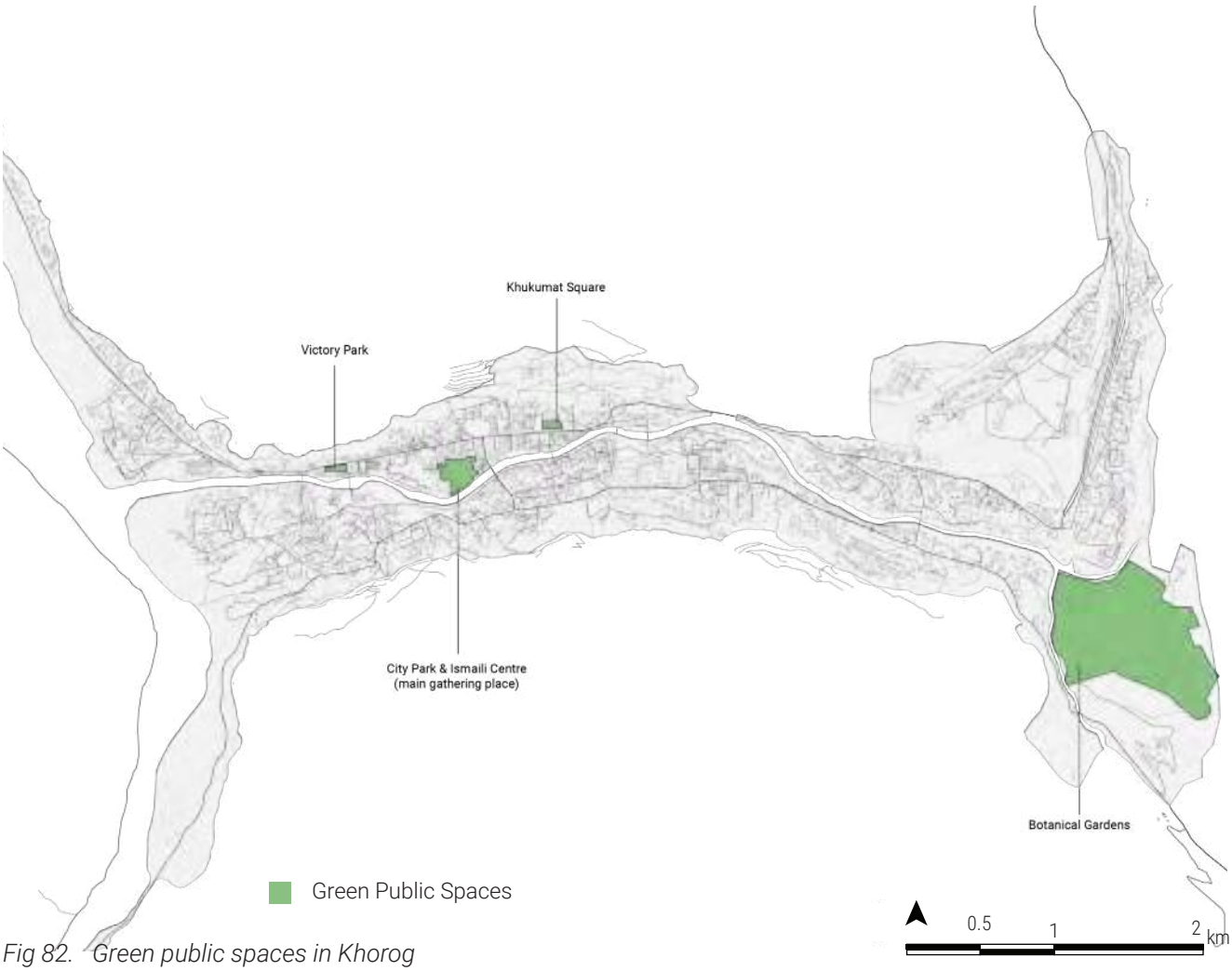


Fig 82. Green public spaces in Khorog

6.1.5. Legislative context of green and public spaces

The system of green spaces, according to the norms of GNiP RT 30-01-2018 "Urban Planning and development of urban settlements", means a set of green spaces of differing significance, possessing the unity of the planning organization, territorial and functional interconnection of elements. In this manner the territory is divided into intra-city and suburban areas. The system of green spaces for a settlement includes those of public use, limited use, special purpose, and those of suburban areas. The relative density of green spaces with different functions within built-up areas should be at least 40%, and no less than 25% within the borders of the housing or mixed-use territories. The general green balance (tree and shrub vegetation, lawn, flower beds) for areas of city-wide and district significance, should constitute at least 40%. For areas of quiet recreation and walks, sports and recreation activities, and children's recreation, the area of green spaces should be at least 70%. [125]

Overall, the legislation of the Republic of Tajikistan provides for general greening of cities, formed according to the size and significance of settlements, their planning structure, architectural and spatial composition of buildings.

Processes for public space provision come from building codes and regulations if associated with public institutions, and from the town plan if associated with open public spaces. The width of greening strips is also regulated by the GNIP. However, norms and standards may be difficult to uphold in Khorog, due to the land limitations in the particular geographic context.

6.2. NATURAL RISKS

6.2.1. Topography

Tajikistan is located in the southern mountainous part of Central Asia and stretches for 700 km from west to east and 350 km from north to south. The area of the country is 142,600 sq. km², which is smaller than the other countries of Central Asia. Mountains occupy over 93% of the country's territory, and more than half of the country is over 3,000 meters above sea level. These areas are not suitable for agriculture due to extreme climatic conditions in these landscapes which consist predominantly of rocks, glaciers and highlands. Absolute altitudes vary from 300m to 7,495 m. A large part of the country is prone to high seismic risk.[126]

Mountainous districts and arid and semi-arid zones are especially vulnerable to dangerous hydro-meteorological events. The Southwest of the country consists predominantly of arid and semi-arid lowlands which gradually merge into foothills. In the North lies the Fergana valley and Kuramin mountain range with the remaining territory adjoining the large mountain systems of Asia-Pamir, Gissar-Allai, the Hindukush and the Tian Shan with a diversity of natural and climatic conditions. The Pamir is divided into Western and Eastern parts. The West has the highest mountains separated by deep river valleys, whilst the East is comprised predominantly of high mountains and an arid plateau area.[127]

The Pamir mountains, separate the GBAO region into Western Pamir and Eastern Pamir. Table 16 provides a comparison between the two regions.

Khorog is located within the Pamir mountains and is therefore particularly susceptible to the extreme natural hazards caused by topographical variation. Formal topographical characteristics in Khorog include steep slopes, composed of loose and fractured rocks and a large number of tectonic faults, joint fissures and seismic dislocations. Wide-spread occurrence of friable fragmental glacial deposits, and water encroachment are also present at the city-scale. Topographic variation also poses a challenge to accessibility in Khorog, as it can cause urban fragmentation, which leads to an increased dependency on private vehicles.

6.2.2. Rockfalls

Rockfalls are both among the most common and the largest-scale natural hazard jeopardizing the safety of the population, residential premises and infrastructure in Khorog. Rockfalls within the city limits occur consistently on all slopes around the city and above the neighbouring populated localities.

Prevention measures include the following:

1) Slope terracing
2) Restoration of terraces with subsequent reconstruction
3) Ban on felling of trees and shrubs in avalanche catchments
4) Afforestation
5) Ban on construction of residential structures in hazard areas
6) Observation and monitoring
7) Temporary evacuation of population from destruction area
8) Training of population for temporary evacuation

Sewerage	Liters per person per 24 hours	Price per month per person (in TJS)
Altitude (range) (above sea level)	900 – 7,490	2,970 – 7,130
Average altitude	4,060	4,420
Glaciers	4,333 km2	1,806 km2
Annual average temperature	In the valleys a range of 1.0 and 9.6 At an altitude of over 3,000: -3°C	In the range of (-1.0) and (-5.4) °C
Climate	Mediterranean dry	Central Asian dry

Table. 16. Topography of the sub-regions of GBAO

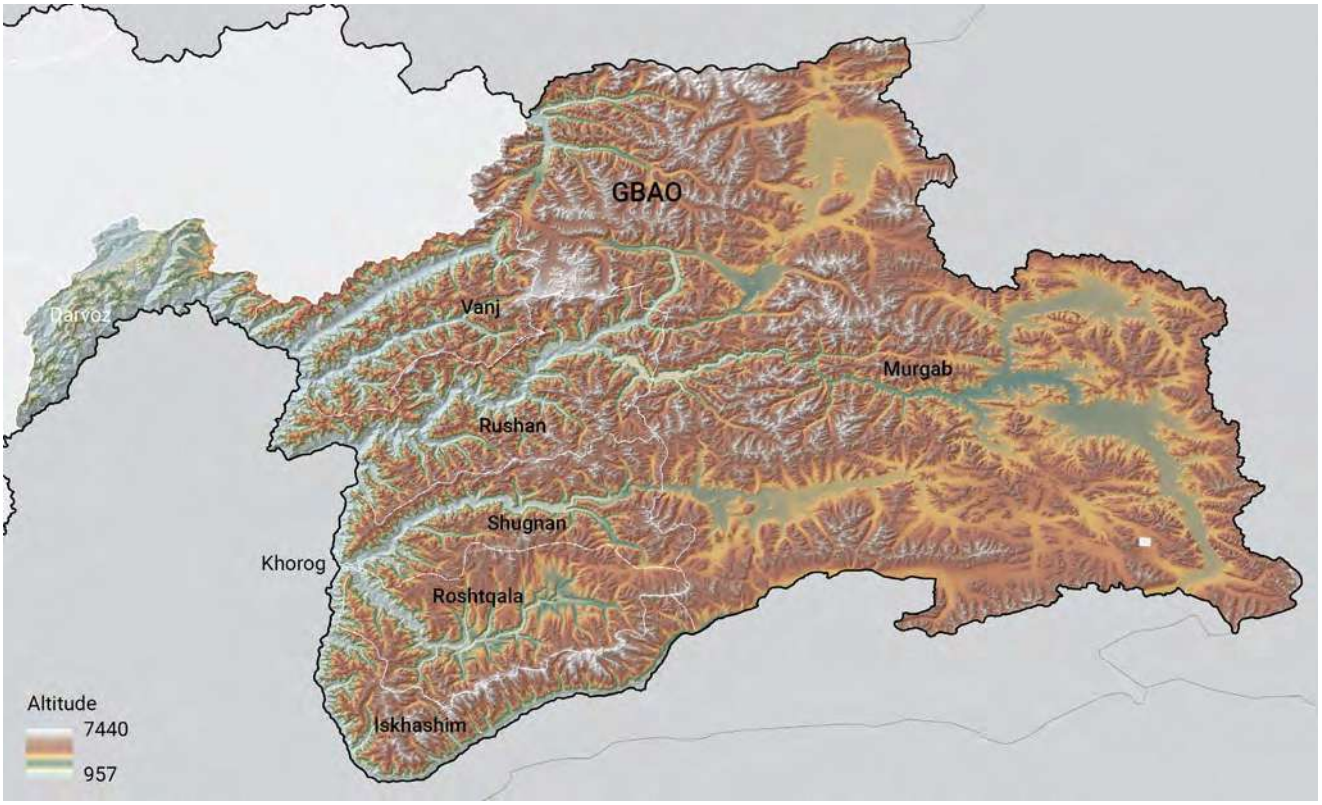


Fig 83. Topography of GBAO

Fig 84. Slope analysis of GBAO reveals that many of the region's natural risks are due to the topography and slope, which make it susceptible to avalanches, landslides, and flooding in lower areas

6.2.3. Landslides

GBAO is susceptible to landslides, with the majority of land classified as high or moderate risk. Landslides in GBAO occur due to many factors, including rainfall patterns, terrain slope, geology, soil, and earthquakes. From Figure 76, it can be observed that areas towards the West in GBAO, with increased slopes are more susceptible to landslides.

In Khorog, landslides occur primarily in the North of the city. There is substantial infrastructure at risk here and due to the speed of such events they can cause widespread infrastructural damage. Some of the suggested protective measures to areas impacted by landslides include the following:

- Ban on development, watering and settlement in the area of former landslides or hazard areas.
- Catchment of outcrop water springs on the landslide body.
- Observation and monitoring of the landslide body activation.
- Temporary evacuation of household residents during activation.
- Carrying out in-depth geological and engineering research works.
- Stabilization of unstable rock blocks and slabs in the sliding tongue.
- Disintegration of unstable blocks and slabs by small-size explosive charges and directed explosions.
- Monitoring of the active parts of the Khufak-Bardzhev landslide.
- Provision of safety zones in landslide areas.
- Moisture-tight insulation and repair of separate canal sections.

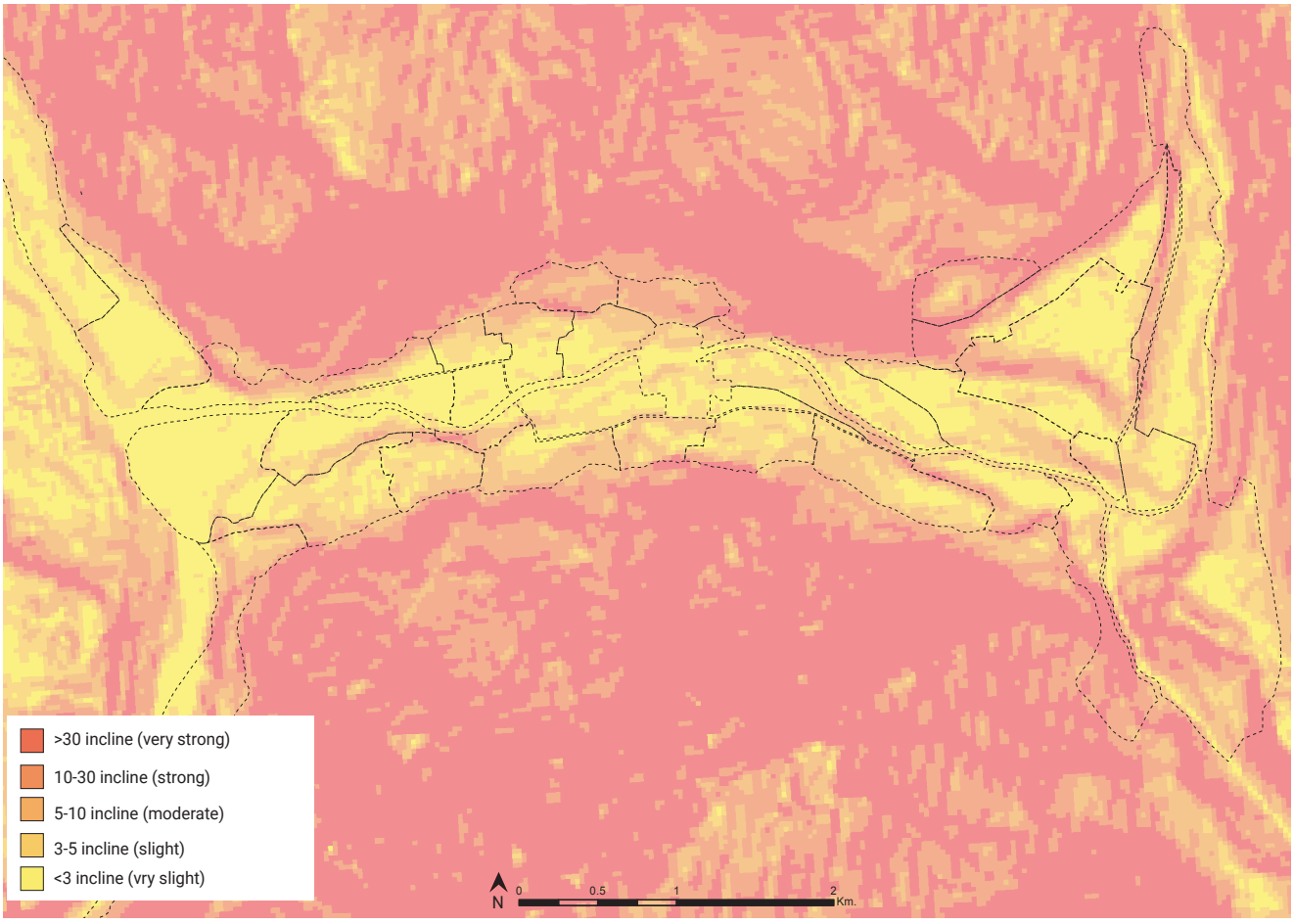


Fig 85. Map showing slope gradient surrounding Khorog

6.2.4. Avalanches

The majority of the country is classified as of high or moderate risk from avalanches. The possibility of snow avalanches in GBAO varies based on the topography, altitude, precipitation and geology. The Western Pamirs sub-region are more susceptible to snow avalanches due to the topography of the dramatic landscape. The presence of glaciers in the Western Pamirs are also another factor that increases hazards.

Avalanches occur regularly in Khorog, in particular in February and March. This is due to slowly warming weathers, heavy snow fall over the winter months, and the steep gradient of hills surrounding the city. In particular, avalanches occur in the Nivodak Mahalla, as well as Tirchid, which includes the Dehqonkhona mahalla, the Meat Factory area and Tem. Nivodak does not have comparable provisions of critical infrastructure with other areas of the city, however, there are residential buildings and a school that are at risk. Tem is classified as a high-risk zone due to the city's reliance on trade and travel through this area.

However, the occurrence of snow avalanche in Khorog is relatively low in comparison with the rest of the country.[128] In recent years, the threat of avalanche to the city was high in 2017 and 200 families were evacuated. Some citizens of Khorog stayed at the houses of friends and relatives, while two families were evacuated to specially organized centres in schools and cultural institutions.[129] Such methods of temporary resettlement have arisen mainly due to the lack of free land in the city.

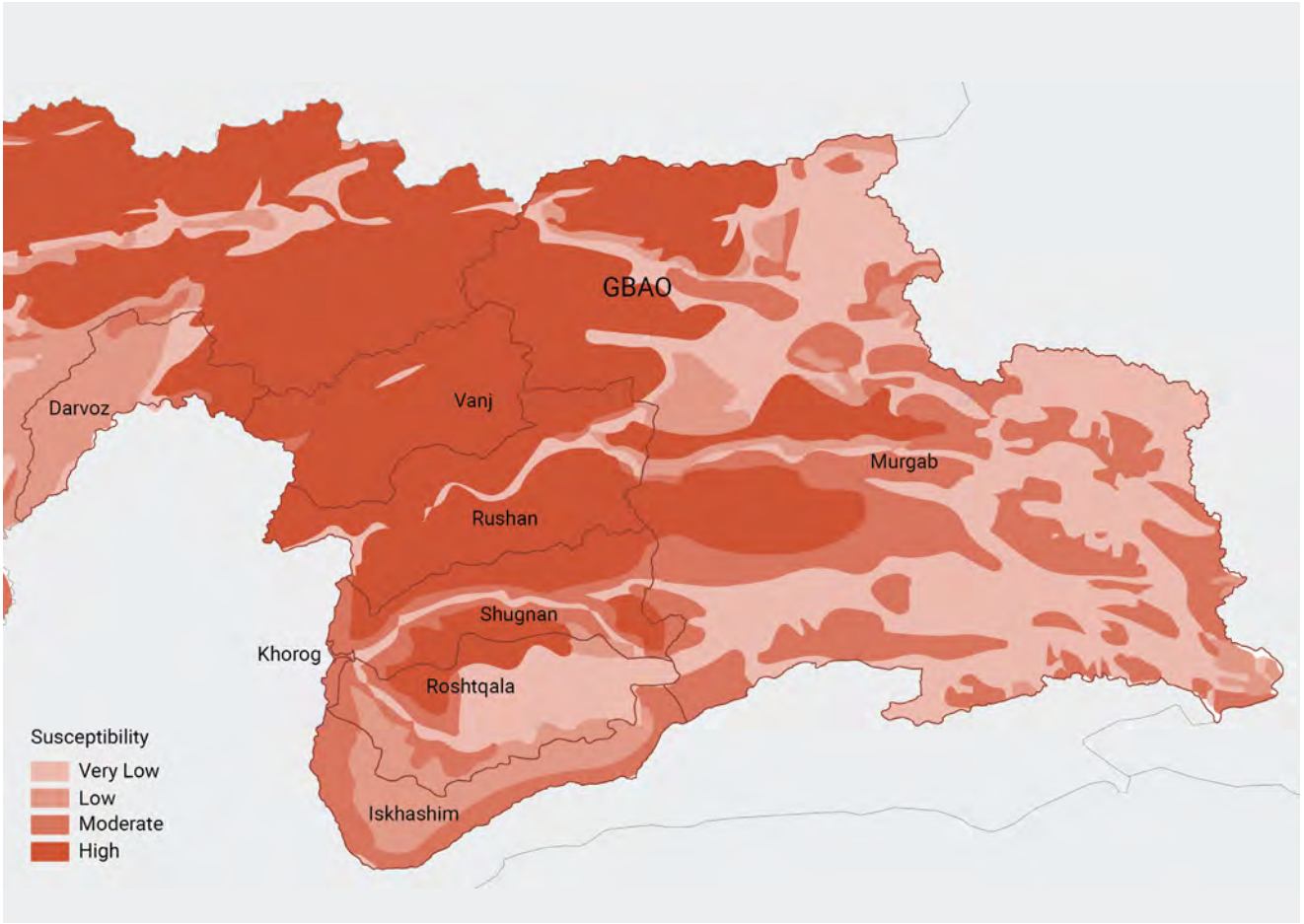


Fig 86. Avalanche susceptibility in GBAO[130]

6.2.5. Floods

Natural resources are highly sensitive to climatic parameters. Considering that the livelihood of many residents of GBAO depends on natural resources, climate change presents a potentially severe impact on GBAO and its residents. GBAO faces many climate shocks, such as temperature and precipitation variation, and subsequent flooding.

The occurrence of urban flooding in GBAO is classified as high, with potentially damaging and life-threatening floods expected to occur at least once in the next 10 years.[131] Figures 82 and 83 reveal that flooding poses the highest risk in Darvoz, Roshtkala and Shugnan. River flooding in GBAO is considered to be of medium risk, with the highest risk impacting Iskashim in particular.[132] A medium risk means that there is a chance of greater than 20% of a potentially damaging and life-threatening river flood occurring in the next 10 years.

Khorog experiences some degree of flooding due to the proximity of infrastructure to the river. Flooding occurs predominantly on the Western edge of the city, where some residential and industrial infrastructure is located. Although density is low, as the city grows, additional measures may have to be enforced to ensure that flooding does not impact construction. Areas of land, for example in Tem, that are predominantly composed of grass and sand, experience highly saturated soil, and mean that building foundations and construction is limited by underground flooding. Khorog therefore, faces both flooding from water bodies and underground flooding from a saturated water table or from out-filtration from poorly construction water channels.

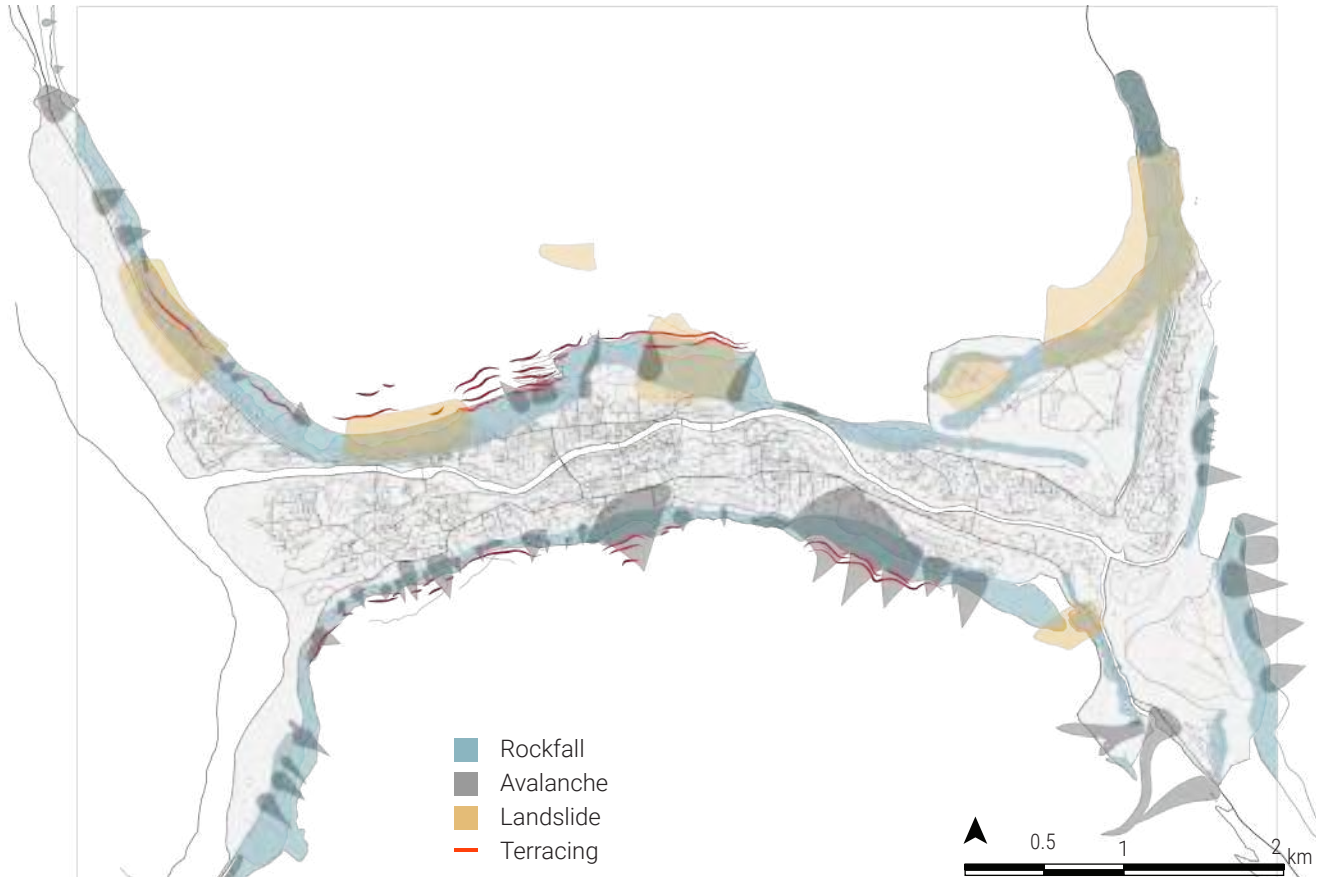


Fig 87. Major risks in Khorog

6.2.6. Floods

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Fig 90. Areas impacted by landslides in Khorog

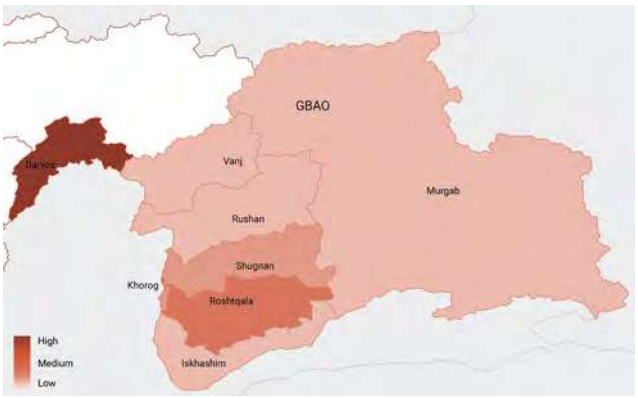

Fig 89. Urban Flooding risks in GBAO

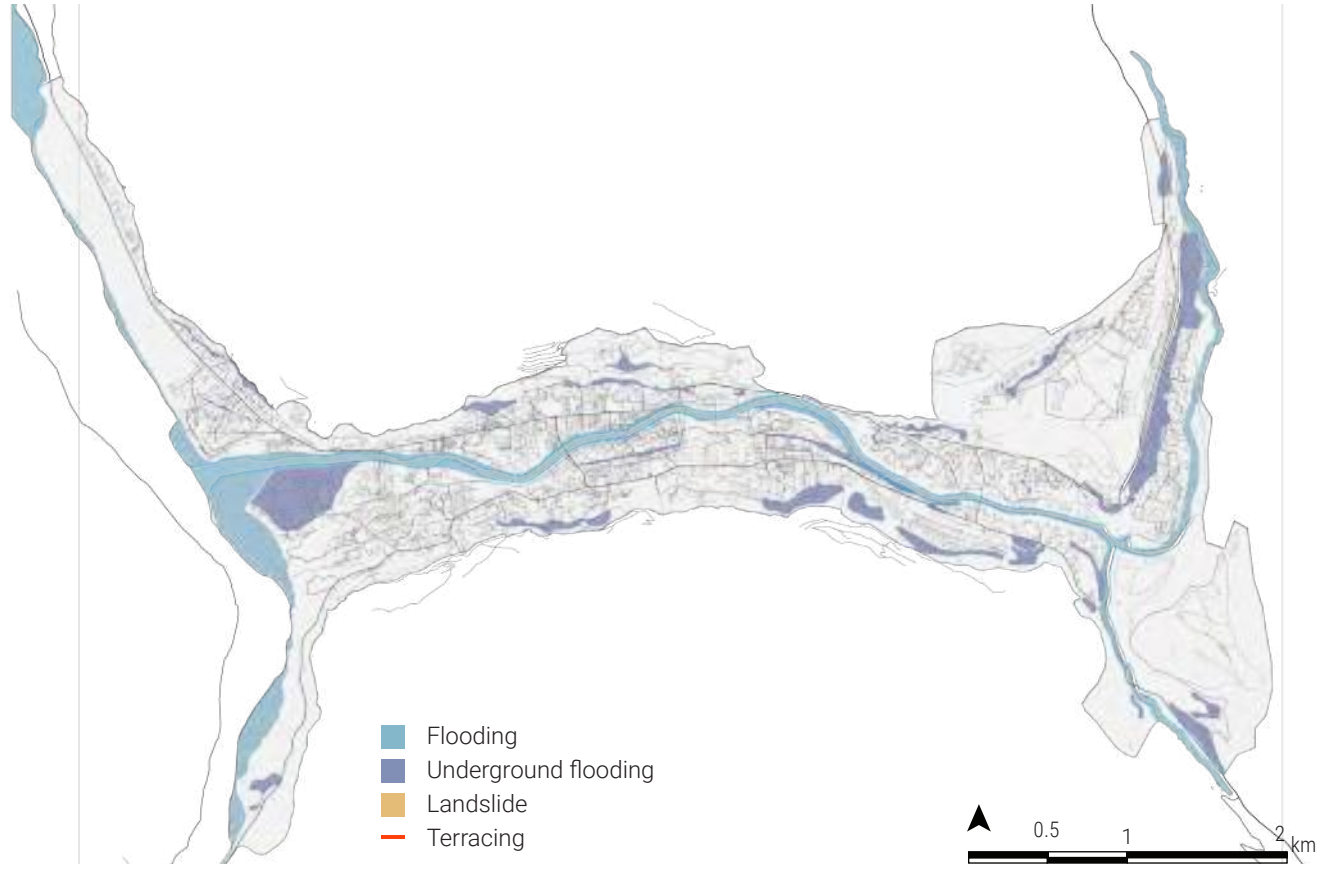

Fig 88. River Flooding risks in Khorog

Although density is low, as the city grows, additional measures may have to be enforced to ensure that flooding does not impact construction. Areas of land, for example in Tem, that are predominantly composed of grass and sand, experience highly saturated soil, and mean that building foundations and construction is limited by underground flooding. Khorog therefore, faces both flooding from water bodies and underground flooding from a saturated water table or from out-filtration from poorly construction water channels.

6.2.7. Earthquakes

Earthquakes are less frequent than floods and avalanches in Tajikistan, GBAO and Khorog. Yet, seismic risk calculation is impacted by the low population density during the past 50 years which limited the casualties from earthquake. Despite this, over 500 earthquakes exceeding the value 5 on the Richter scale have rocked the Pamir region since 1900.[135] Figures 85 and 86 highlight that the majority of GBAO is of a low hazard category for earthquakes with a return period of 100 years. However, when the return period is adjusted to 1000 years, the risk of earthquake increases to high for the majority of the region.

A recent earthquake with a magnitude of 7.2 struck GBAO in 2015 and caused widespread damage to infrastructure. Its impact included blocking of major transportation routes, displacement of 652 people, and leaving 4,000 in need of assistance. Due to the region's remote location and limited access, response was significantly constrained.[136]

Khorog is particularly prone to earthquakes due to a large number of tectonic faults, joint fissures and seismic dislocations within the area. The city is situated at the intersection of the three largest and active seismic zones of the South-West Pamir – Gunt-Alichur, Garm-Chashma and Shoh-Dara. The territory is exposed to the cumulative impact of strong and very strong earthquakes registered over the last 100 years in this region.[137]

Fig 91. Area of the former bead factory, May 2021

6.3. CLIMATE RISKS

6.3.1. Temperature

Tajikistan is located at the meeting point of powerful atmospheric circulation processes. One of these is the Siberian anti-cyclonic system that dominates the winter period. Cold air from the Arctic often reaches the Southwestern parts of Tajikistan, and the mountains surrounding the country in the North and East create a favourable environment for retention of cold air masses. The inflow of warmer air in winter results from the intrusion of tropical air masses. Thermal depressions dominate the summer period. The proximity of arid areas and high mountains, as well as clear, dry, and hot weather contribute to their formation.[138]

The greatest concern in Tajikistan has been an increase in air temperature, which has severe implications for its glaciers and water resources. Ground air temperatures are increasing in most districts and high-altitude zones.[139] The most significant increase in annual mean temperature has been at Dangara of 1.2°C and Dushanbe, of 1°C over 65 years. In mountainous areas, a temperature increase of 1.0 to 1.2°C was observed in Khovaling, Faizabad and Iskashim.[140]

Over the last 50 years, the annual average temperature in GBAO has increased by up to 1.2°C. Climate projections indicate that it could rise further, reaching a level up to 2.9°C higher by 2050, than that of the 1961-1990 period, with the highest impact felt during the winter.[141] Figure 87 indicates that Darvoz is likely to witness a period of prolonged exposure to extreme heat in the next 5 years, resulting in heat stress.[142]

Khorog's temperature can range from -10 to 30°C, with the warmest months in July and August.

GBAO is also susceptible to wildfires, with a chance of greater than 50% of weather that could support the spread of a significant wildfire that is likely to result in both life and property loss. [143]

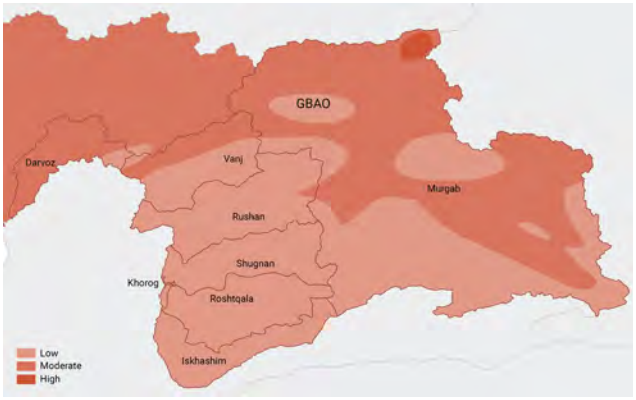

Fig 92. Earthquake hazard with 100-year return-period x[144]

Fig 93. Earthquake hazard with 1000-year return period[145]

Fig 94. Extreme heat risks in GBAO

6.3.2. Rainfall

In Tajikistan, approximately 75% of annual rainfall takes place during the colder times of the year. The majority of precipitation falls in mountainous districts that are open to humid air masses from the West. The maximum level of rainfall is observed in the mountains of central Tajikistan, which experience approximately 1,000 to 1,800 mm of rainfall per year.

There is no clear precipitation trend for GBAO. Scientific sources state that precipitation has decreased in the East Pamir by 5-10%, while a slight increase has been observed in the Western Pamir.

It can be observed that Khorog has witnessed an increase in precipitation. Extreme precipitation events have become more frequent; days with precipitation of 5 meters or more occur more often and result in floods, water-induced landslides and mudflows.

The rainiest months in Khorog are March and April and there is snow fall between December and the end of February. Snow melt in spring is often followed by periods of avalanches and landslides.

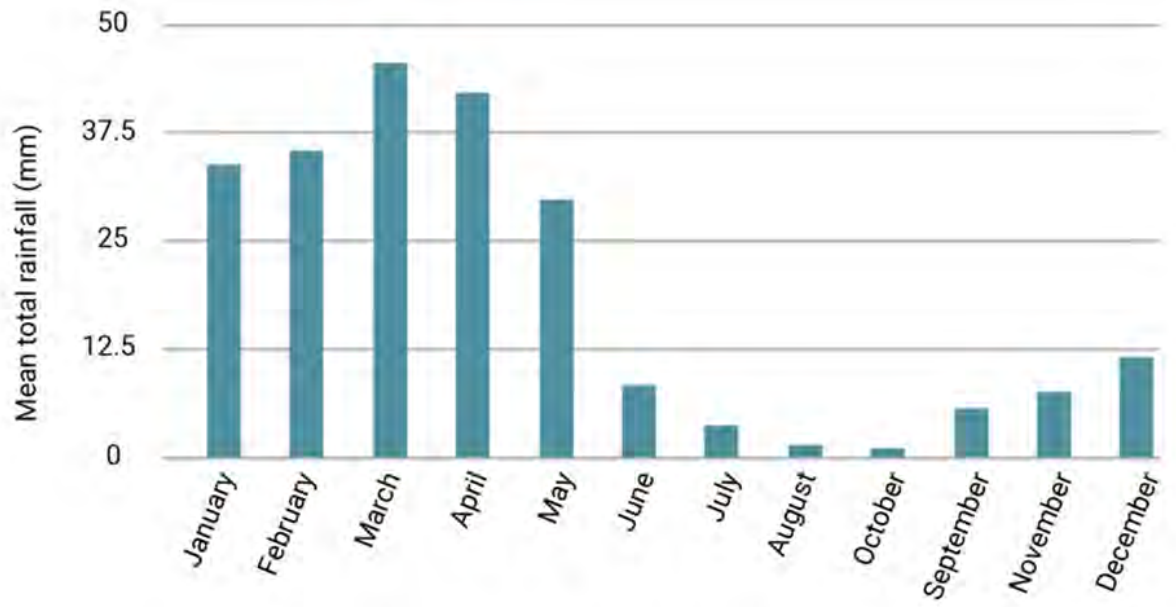

Fig 95. Rainfall in Khorog

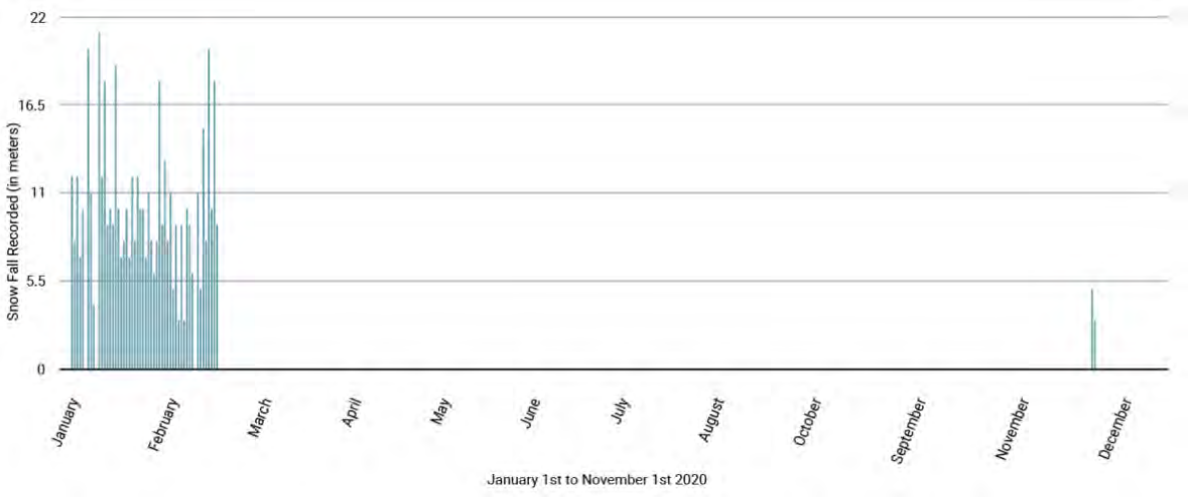

Fig 96. Snow fall in Khorog (m) Snow fall in Khorog (m)

Fig 97. Riverfront in the central area of Khorog, May 2021

6.3.3. Glaciers

The last inventory assessment of glaciers in Tajikistan was carried out in the 1980s, mapping approximately 8,492 glaciers, with a total area of 8,476 km². After this date, no inventory of glaciers within the territory of Tajikistan has been conducted. According to preliminary 2013 estimates, glaciers covered approximately 7,000 km² or 4.8% of the country's land area.

Due to warming temperatures, glaciers continue to shrink.[146] Approximately 20% of the country's glaciers have retreated and some have already disappeared. Up to 30% more are likely to retreat or disappear by 2050. Annually, melting glaciers bring in 10 to 20% of water to rivers but during dry and hot years it can be up to 70%.[147] Tajikistan's approximately 8492 glaciers regulate river flow and provide water, not only for Tajikistan but also for neighbouring Turkmenistan and Uzbekistan.[148]

Many of GBAO's glaciers are part of the Tajik National Park and the Amu Darya watershed. Figures 92 and 93 demonstrate changes in land cover due to temperature changes that result in seasonal shifts. In the winter, the majority of land is covered by glaciers, while in the summer, deglaciation occurs, revealing bare land below the snow.

If the present rate of glacial degradation persists, the small glaciers of Tajikistan will completely disappear in 30 to 40 years and the total glacial area will shrink by 15-20% compared to its present extent.

6.3.4. Droughts

More frequent droughts and heightened extreme weather conditions are disproportionately affecting impoverished communities, eroding their resilience. Year-long deforestation in the country has led to soil erosion, and with precipitation higher than the soil infiltration capacity, the country experiences around 50,000 landslides a year. This, along with higher air temperatures, reduces road and infrastructure strength, and impedes mobility upon which many livelihoods in the country rely.

Low-income populations will be more directly affected by climate change, as extreme weather patterns can lead to lower food production, increased prices and lower wages for agricultural workers. Response to damages caused by natural disasters amounts to an expenditure of 4.8% of the national GDP, with negative impacts found most prominently in impoverished communities. Unstable energy provisions will limit the economic growth and social welfare of the country. It is vital to undertake a predictive climate change assessment in order to understand its likely spatial, social and economic impacts on the country.

The predictions suggest that an increase in the frequency and intensity of droughts and heat waves is likely. Farmers of the region also report that currently in early summer, water runoff in connection with increased precipitation has caused inundation and mudflows, while in late summer the water level drops drastically, hampering agriculture. Drought hazards for a return period of 10 years are predicted to be low for GBAO region but high and very high for a return period of 50 years. [149]

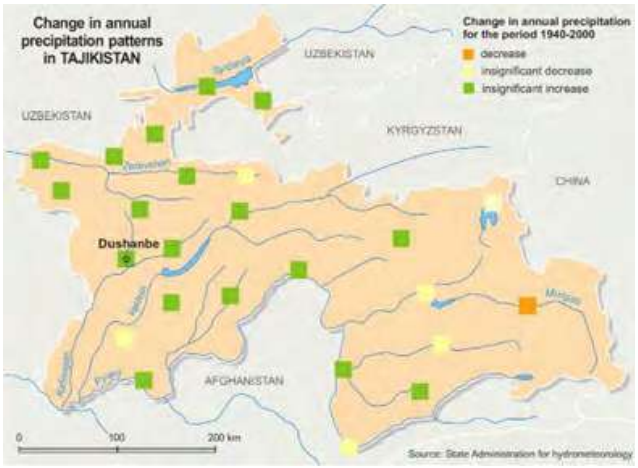

Fig 98. Change in annual precipitation patterns in Tajikistan[158]

Fig 99. Drought possibility in GBAO region, with a return period of 50 years [159]

Fig 100. Topography of GBAO

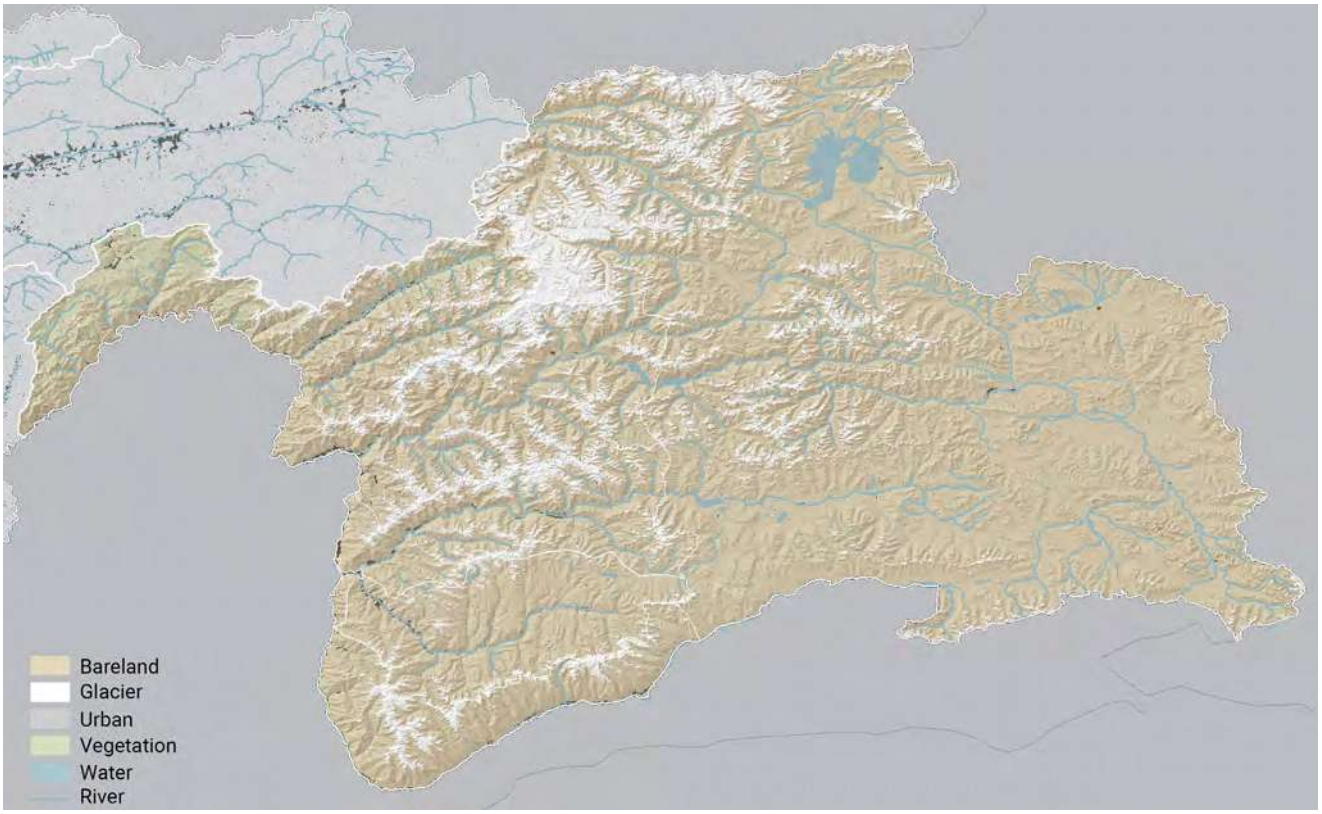

Fig 101. Slope analysis of GBAO reveals that many of the region's natural risks are due to the topography and slope, which make it susceptible to avalanches, landslides, and flooding in lower areas

6.3.5. Greenhouse Gas Emissions

Although the country does not have quantitative UNFCCC commitments for the reduction of emissions, the current level of emissions as compared to 1990 have reduced by one third, mainly due to the collapse of the Soviet Union and structural changes resulting from the transition to a market economy in independence. While the level of carbon dioxide has remained stable during the last decade, in the current decade, an increase in emissions is expected.[150]

IN the period from the late 1990's to present, agriculture has remained the primary source of GHG emissions. Considering the low level of mechanization, underfeeding of livestock, and limited use of fertilizers, emissions from the agriculture sector of Tajikistan are lower than in the other countries of Asia and Europe. Opportunities for any considerable reduction of the carbon footprint of agriculture are therefore, limited, while measures in other economic subsectors, especially in energy and industry, are more promising.[151]

Currently, 98% of the electricity in Tajikistan is generated from hydropower, which produces a minimal level of carbon dioxide and has great potential for development and growth.[152] However, since 2010, coal mining has increased as a measure to address the seasonal energy deficits and as a substitute for gas imports, which are often problematic. This coping strategy might result in an increase in carbon dioxide emissions in the near future.[153]

In Khorog, the lack of flowing water in winter and the consequential lack of hydropower in the city, means that communities are forced to cut down trees for fuel and heat. This de-forestation exacerbates challenges but also reduces air quality. During the winter months, carbon emissions are high and air quality in Khorog is poor, though this challenge can only be addressed through alternative, reliable energy sources.

6.3.6. Summary of Hazards and Vulnerability

Risk	Rating (0-10)
Hazard & Exposure	**8.3**
Natural disasters	**8.8**
Earthquakes	8.8
Flood	9.1
Landslide	10.0
Drought	5.9
Human	**7.7**
Project conflict risk	8.2
Current conflict	7.0
Vulnerability	**7.6**
Socio-Economic Vulnerability	**6.8**
Development & Deprivation	8.3
Inequality	5.0
Aid Dependency	5.4
Vulnerable Groups	**8.3**
Uprooted People	4.5
Health Conditions	8.5
Children Under 5	4.3
Recent Shocks	10.0
Flood Security	9.7
Lack of Coping Capacity	**7.9**
Institutional	**8.1**
Governance	6.6
Economy	10.0
Humanitarian	7.6
Infrastructure	**7.7**
Communication	6.7
Physical Infrastructure	6.7
Access to Health Care	9.8

Table. 17. Risks facing GBAO, Tajikistan, according to the INFORM Risk model[160]

GBAO is one of the most susceptible regions to natural disasters in the country. A geographic analysis of incidents in Tajikistan in 2018 shows that 9% were registered in the Gorno-Badakhshan Autonomous Region and caused material damage amounting to 8,400 TJS (0.1%). For comparison, in 2017, 30% of registered natural emergency incidents occurred in GBAO, amounting to 14,304,400 TJS in material damage[154].

Risks arising from climate and the natural conditions of landscapes are inter-linked. In July 2015, high temperatures led to rapid glacial and snow melt, which in turn, led to an increase in landslides in the region. Heavy rains in combination with this glacial melt caused mudslides. Simultaneous hazards lead to increasingly unpredictable infrastructural destruction of both residential areas of the city, power lines, and access routes. For example, many sections of road between Dushanbe, Kulyab, Khorog and Murgab-Kulma were destroyed, which carried implications both locally and on a wider radius, as this is a major international access and trade route to China.

Figure 96 highlights GBAO's hazard exposures, as rated by the INFORM subnational model of Central Asia & Caucasus.[155] The INFORM model identifies areas at high risk of disasters to support coordinated actions in preparation. The model is based on risk concepts published in scientific literature and envisages them in three dimensions: Hazards & Exposure, Vulnerability, and Lack of Coping Capacity. Results are then rated on a scale of 0 to 10, whereby 0 constitutes the lowest risk and 10 constitutes the highest risk.

Khorog is paradigmatic of the challenges to climate resilience faced at the national and regional scales, which is exacerbated in the city's case by degrading critical infrastructure and poverty levels. The majority of the land upon which Khorog is built is considered to be of high risk. Off-season and unpredictable hazards have begun to occur more frequently as a result of climate change. Without a state-run emergency response support system, communities are reliant on shared knowledge to predict and adapt to natural hazards. As hazards become less predictable, and without a full monitoring system, communities may be increasingly exposed to risk.

The identification of climate risks and impacts is a critical component of an iterative risk management system that will be useful for decision-making in complex situations characterized by large potential impacts, persisting uncertainties, long time frames, learning potential, and multiple climatic and non-climatic impacts that are changing over time. Knowledge of climate risks is essential to properly understand variability and to develop adaptation measures. Knowledge of the historical interactions between climate threats and society, including the

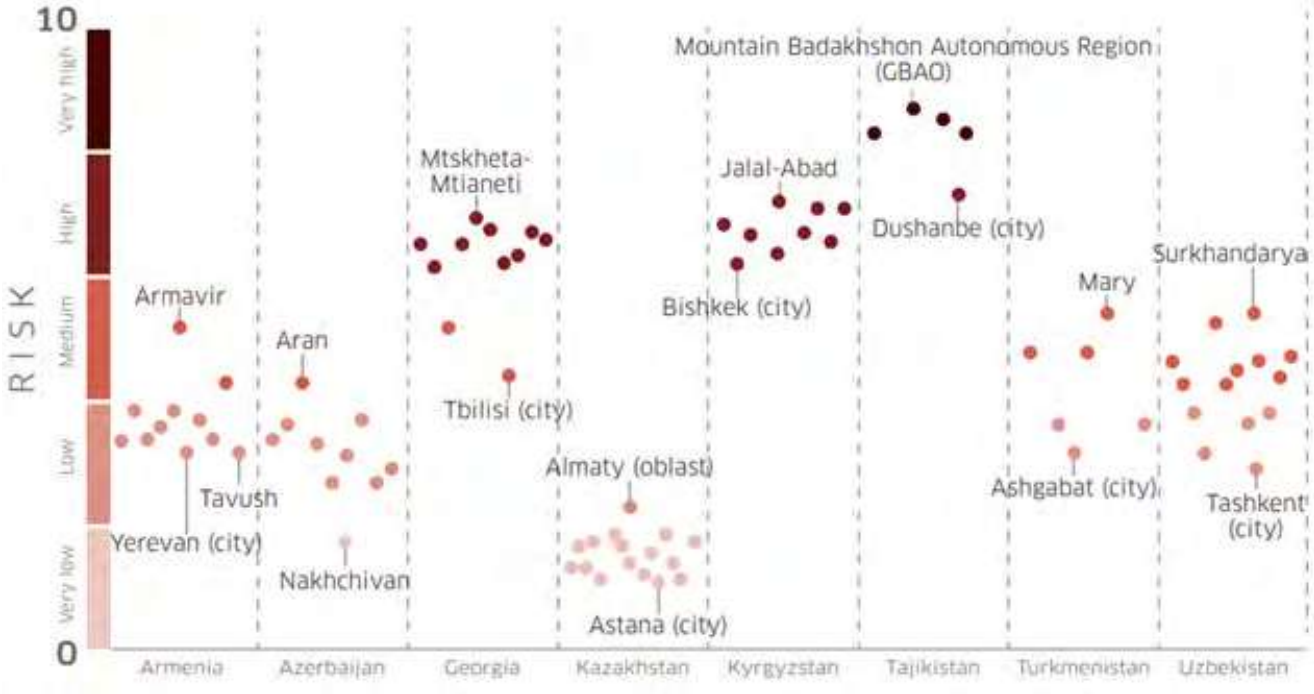

Fig 102. Risk distribution of Central Asia and the Caucasus[161]

adaptation measures that have been designed to cope with these threats, is an important initial step in developing adaptation measures to manage future climate risks.[156]

Due to the lack of information and monitoring on the impacts of climate change or of natural risks, a key challenge for Khorog is the reactivity of the population and the ability to mobilize resources at short notice to respond to natural hazards and disasters. Notwithstanding the number of assessments associated with the natural environment in the region, there is no apparent unified database that comprises both governmental and non-governmental studies and outcomes on a national, regional or local level, to facilitate knowledge sharing in regard to hazards, infrastructure vulnerability and climate change to support adaptation measures in Khorog.

An example of the limited integration of climate change assessments with urban planning is the AKAH and MGA 2010 master plan for Khorog that, although not approved or implemented, considers natural hazards for the city but does not include climate change and its effects on the local climate and natural disasters. The importance of data sharing between authorities and organizations is necessary both nationally and internationally, as, for example, hazard and natural disaster risks which are not managed on the Afghan side of the border, may lead to damaging effects on infrastructure in Khorog.

6.3.7. Local scale environmental resilience - ongoing and planned projects

The 2012 United Nations Development Program's Human Development Report recommended specific local scale programs that include:

- education programs;
- water management, new water reservoirs, water saving methods such as drip irrigation and improved access to sanitary water sources;
- promoted research projects;
- specific focus on forestation efforts;
- renewable energy technology; and,
- increased private business engagement with climate change mitigation.[157]

These suggestions have been addressed to an extent by an increased private sector engagement in Khorog, as well as projects and investments from The Aga Khan Foundation and other international organizations. There are a number of agencies in Khorog that engage with environmental protection programs which include the following:

- Climate change adaptation
- Soil conservation
- Sustainable natural resource management
- Pasture management
- Joint forest management
- Sustainable tourism
- Resource management
- Sustainable, reliable energies
- Terrace building
- Planting (erosion)
- Riverbank improvements

The AKAH sub-section of the AKDN has a specific climate strategy which includes the following principles

i. Disaster risk reduction through structural and non-structural mitigation;
ii. Skills enhancement and training;
iii. Community emergency management through community response teams, emergency stockpiles, emergency communications, and awareness raising and planning;
iv. Habitat assessment through hazard risk assessments, integrated habitat assessments;
v. Municipal services through provision of rural and urban water supplies; and,
vi. Resilient facilities through public facilities construction.

Examples of regional climate change resilience projects include:

- **Mountain Societies Research Institute:** which provides capacity-building and research on climate resilience, for example, through the "Pathways to Innovation" 3 week Course. 30 ECTS (European Credit Transfer and Accumulation System) Certificate Program in Natural Resources Management (CNRM) is intended to improve capacity-building on sustainable land management, integrated agricultural management, food systems, livelihoods in rural mountain communities, natural hazards, disaster risk reduction, and climate change. In June 2019, a collaboration was established between the Pamir Biological Institute (PBI) in Khorog, producing research on wheat varietal screening, and geoscience researchers from the University of Bern (Switzerland) and the University of Natural Resources and Life Sciences (Austria), to deliver a 10-day training program on disaster risk management in Khorog.
- **The Foundation for Innovative and Sustainable Technologies (FIST), Centre for Sustainable and Innovative Technologies (CSIT)**, funded by the Mountain Societies Development Support

Program (MSDSP) of Tajikistan, the Aga Khan Foundation of Afghanistan, and the Children's Hope Foundation of Dubai.
  - CIST – increasing the number of innovative technologies widely used in Tajikistan.
  - FIST – assisting in fundraising and awareness raising activities as well as networking.
- **Fostering Disaster Resilient Communities in Isolated Mountain Environments:** A DIPECHO project with the European Commission's Humanitarian Aid Department (ECHO), under the auspices of its Disaster Preparedness Program (DIPECHO).
- **Creating Opportunities in a Safe Environment (COSE):** Fostering Self-Sustained and Resilient Communities", co-funded by the Swiss Government and implemented by FOCUS, the Mountain Societies Development Support Program (MSDSP) and the Aga Khan Foundation (AKF).

Further activities include an Assessment of Natural Hazards and Vulnerability (ANHV) that was carried out in Khorog by Focus Relief International in 2016. This was part of the project for Climate Change Adaptation in the Pamir Mountains of Tajikistan (CCAPM), supported by the Government of Canada's Department of Foreign Affairs, Trade and Development (DFATD) and the Aga Khan Foundation Canada. The report attempted to address the missing elements in previous natural risk assessments, for example, the 'Sarez Lake Outburst Hazard Reduction' by Focus Relief International, assessments by the State Department of Geology under the Government of Tajikistan, The Committee for Emergency Situations and Civil Defence. One major criticism of previous assessments by the ANHV was that there lacks a common database encompassing processes for comparison on the study outcomes and applications in various locations and scales. There also lacks a long-term strategy or future data gathering agenda for these assessments, which is of particular importance for rapidly changing environmental conditions and human-induced changes such as the speed of deforestation, agricultural land growth, urban growth in Khorog, engineering and infrastructure projects, and infrastructural degradation.

The local government have considered the following programs as a part of their 2020 work plan:

- **Policy and Governance:**
  - Identification and monitoring of environmental crimes
  - The development of a City Mayor's Order improvement and landscaping in Khorog
  - Compliance with gas emission standards
  - Controlling waste removal and decontamination processes
- **Capacity-building and knowledge sharing:**
  - A Day of Environmental Protection
  - Environmental awareness training in schools
- **Technical and practical works:**
  - Removing mercury lamps in Khorog
  - A sanitary and environmental survey of Khorog's rivers and reservoirs

Fig 103. A house in Andarsitez, May 2021

6.3.8. Legislation for Climate Action and Resettlement

According to Article 10 of the Law "on the protection of the population and territories from natural and man-made emergencies", local executive bodies of state power of the Republic of Tajikistan are responsible for the following actions:

- Carry out training and maintenance in readiness of the necessary forces and means to protect the population and territories from emergencies, educate the population on methods of protection and actions in these situations;
- Carry out evacuation measures in emergency situations;
- Carry out, in the prescribed manner, the collection and exchange of information in the field of protection of the population and territories from emergencies, provide timely notification and inform the population about the threat or occurrence of emergency situations;
- Organize and carry out rescue and other urgent work, as well as maintain public order in the course of their implementation, and, in case of insufficient own forces and funds, they are to seek assistance from the Government of the Republic of Tajikistan;
- Carry out financing of measures in the field of protection of the population and territories from emergencies;
- Create reserves of financial and material resources for emergency response;
- Contribute to the sustainable functioning of organizations in emergency situations.[162]

The Main Department of Geology of the Republic of Tajikistan identifies environmentally dangerous zones, based on surveys of specific areas within districts, and provides opinions on the location status subject to exogenous processes. Dangerous zones are revealed through aerial assessment including the decryption of satellite images and aerial photographs, continued satellite sensing of the earth's surface, and complimented with interviews with the local population. A plan was developed to resettle populations in dangerous zones based on this research. According to the long-term migration planning for households prone to exogenous factors, 7,664 households were resettled during the period from 2000-2004, and 7,200 households were resettled during the period of 2005-2010.

Often population resettlement from extra-hazardous zones is proposed after the occurrence of natural and technogenic disasters. More often, the territories of settlements prone to the threat of avalanches and floods are considered potentially hazardous. Dry washes, rivers, and streams flowing down slopes constitute potential dangers. The intensive ploughing of such slopes, unregulated cattle grazing, the failure to follow safety rules for construction, excessive irrigation, and heavy precipitation may cause more intense avalanches.

Decisions on the population's resettlement and the means for such resettlement from the hazardous zones are established by the executive authorities of regions, districts, and cities, based on the application of citizens, farms prone to disasters, and the expert opinions of geologists, in coordination with other authorized bodies.

Government agencies are responsible for the selection of resettlement areas. The Committee for Architecture and Construction and its district offices allocate land plots and local authorities make decisions on the allocation of such plots. In this way, the key linkages in resettlement decision-making are the Committee for Architecture and Construction of the Republic of Tajikistan and the district authorities. An interagency commission also plays an important role in district authorities.

Each family receives a concessional loan of 3,000 TJS (approximately $265 USD) and 300 TJS (approximately $26.50 USD) as a lump sum for financial support.[163] Each household receives a plot of land of 0.08 – 0.10 hectares for building a house.[164] In this way, traditional social institutions play an additional role to the state in assisting environmental migrants.

All hazardous areas undergo their assessment in the design of the general plan and are considered in the process. This is undertaken by the following state actors:

1) Bodies of executive authorities, government agencies and organizations dealing with the tasks of studying and analysing the natural conditions of the territory of the Republic of Tajikistan, including performing forecasting work on the occurrence and consequences of natural hazards and disasters;

2) Bodies of executive authorities, ensuring economic development, agricultural production, ensuring the uniformity of requirements and regulations, as well as their implementation on the territory of the Republic of Tajikistan;
3) Bodies of executive authorities that carry out tasks for the development and implementation of state policy and regulation in the field of short-term, medium-term and long-term strategies and programs for the economic development of the country and individual regions.[165]

6.3.9. Climate Risk Information in Urban Planning

As a mountainous country, Tajikistan's ecosystems are fragile and vulnerable.[166] A lack of human and institutional capacity to effectively mitigate and manage the risks and impacts of climate change makes it difficult to reduce vulnerability to climate change and build resilience to levels necessary to cope with looming challenges. Projected climate change could not only reverse development gains of the past, but also plunge more people into extreme poverty, reducing agricultural yields, increasing food costs, and increasing the spread of vector-borne diseases.[167]

According to Article 66 of the Town Planning Code, permits to begin construction work on objects of republican and strategic importance are issued by an authorized state body in the field of architecture and urban planning. The list of such objects of importance is approved by the Government of the Republic of Tajikistan and issued by an authorized state body in the field of architecture and urban planning.[168] Permits to begin construction work on other objects are issued by local authorities of architecture and urban planning. The Unit for Urban Planning Activities Licensing is the executive body of state power that licenses urban planning activities in the country and is located in the Management Scheme of the Committee for Architecture and Construction under the Government of the Republic of Tajikistan.[169] In order to obtain a permit for the commencement of construction work, reconstruction, or capital construction of the corresponding object, a person makes an application to the local authorities of architecture and urban planning. Copies of the following documents are attached to the application:

- decisions of the local executive body of state power on the construction of buildings and structures;
- title document for the use of a land plot (certificate for the right to use land);
- approved development document;
- a positive conclusion of the examination of project documentation, in the case of the mandatory state examination of project documentation, in accordance with Article 64 of this Code;
- conclusions of the state ecological experts.

Requirements for ecological safety are provided in GNiP RT 30-01-2018 "Urban Planning and Development of Urban Settlements". It includes urban planning requirements for the regulation of the functional use of the territory of the settlement and suburban area, as well as the placement of individual planning elements and objects and should consider:

- the level of environmental hazard of the planned urban activities;
- compliance of the planned activity with the requirements of environmental legislation;
- the sufficiency and validity of measures for environmental protection developed in urban planning projects.

Climate responsive urban planning requires an understanding of the relevant climate risks and the associated vulnerability of people, ecosystems and sectors. The Agency on Statistics under the President of the Republic of Tajikistan is a state body responsible for collection of statistical information including, among others, information on climate risks. It receives statistical reports from economic entities on the following issues:

- protection of atmospheric air;
- emergency situations of natural and technogenic character and measures to eliminate them;
- solid municipal waste;
- specially protected natural areas.

Such environmental information on events that pose a threat to human health and the environment is used by central and local governments to prevent or mitigate damage and threats.[170] Such information includes weather forecasts and information on extreme and emergency events, as well as summaries of the sanitary and epidemiological situation. This information also ensures compliance with city plans and climate resilience standards.

6.3.10. Assessment of the Climate Vulnerability of Urban Plans

In general, the environmental impact assessment (EIA) is provided by the Law of the Republic of Tajikistan "On the Environmental Impact Assessment" of July 18, 2017, No.1448,[171] and consists of the following stages:

1) review and assessment of territorial environment carried out with the view to justify the optimal choice of an appropriate land piece for location of the facility;
2) preliminary environmental impact assessment simultaneously accompanied by a feasibility study of the project and formalized in the form of a Statement on Environmental Impact assessment;
3) impact assessment carried out for the purpose of a full and comprehensive analysis of the possible consequences of project implementation, justification of alternative options and development of an environmental management plan (program). The report on environmental impact assessment should contain a description of the technical solution for preventing negative environmental impacts. At this stage, standards are developed for emissions into air and discharges into water bodies, formation, storage and placement of solid and liquid wastes;
4) post-project analysis, conducted once a year after commissioning of the facility (start of economic or other activates) in order to confirm environmental protection and to adjust the environmental management plan (program). [172]

According to the Decree of the Government of the Republic of Tajikistan dated November 1, 2018, No. 532 "on the procedure for assessment at the environmental level, classification of assessment objects by categories, depending on their impact on the environment, as well as criteria for determining the categories of proposed activities for the environment",[173] an environmental impact assessment is carried out during the development of:

- projects of program documents for socio-economic development;
- projects of state and territorial integrated schemes for the protection of nature and the use of natural resources;
- design (town planning) documents;
- pre-design and design estimates (design, detailed design) documentation for the construction of new facilities, reconstruction, expansion, technical re-equipment, conversion, conservation and liquidation of existing facilities;
- projects for the creation of specially protected areas, the introduction of species of flora and fauna, the preservation of biodiversity and other natural conservation measures.

The responsibility for carrying out the environmental impact assessment (EIA) lies with the customer of the development project. The Law "on the Environmental Impact Assessment" details the functions of the customer. The customer of economic and other planned activities is responsible for the implementation of the following actions:

1) organization and implementation of the environmental impact assessment procedure;
2) development of a complete and reliable environmental impact assessment report;
3) considering the environmental and related consequences of the project implementation (during construction, reconstruction, expansion, technical re-equipment, operation and liquidation of economic facilities and complexes);
4) financing of the environmental impact assessment procedure and related research;
5) providing the developer (contractor) with pre-project and project documentation information at her/his disposal on the environmental consequences of the construction and operation of similar existing facilities, collected through industry monitoring, assessment of the medical-geographic situation or in post-project environmental analysis;
6) submission of a report on environmental impact assessment as part of pre-project and project documentation for the state ecological experts;
7) ensuring compliance with the conditions outlined in the consideration of the environmental impact assessment report during the implementation of the project (construction, operation).

The developer (contractor) of pre-design and project documentation is responsible to the customer for the following actions:

1) observance of the staged assessment of the environmental impact;
2) development of a report on the assessment of environmental impact, the completeness, reliability and quality of the results obtained in it.[174]

State ecological expertise for all investment projects lies within the responsibility of the Committee for Environmental Protection under the Government of Tajikistan and its regional offices. In addition, according to the Law "On State Environmental Expertise" of December 2012, all construction works, including rehabilitation works, must be assessed for their impact on the environment, and the proposed mitigation measures are reviewed and monitored by the Committee for Environmental Protection. [175]

6.3.11. Local implementation of national climate legislation

Despite the legal provisions for population resettlement in Tajikistan, in practice in the city of Khorog, neither the market value of the land from which the resettlement takes place, nor the provision of an alternative land plot is provided. This is because most of the city's territories are deemed dangerous for living, and citizens who wish to rent a certain piece of land, being notified in advance of its dangerous location, still negotiate with local authorities and receive such plots. Practice stipulates that they write receipts indicating that they are cognizant of the dangerous location of the land but are still prepared to rent it. Thus, in the event of an avalanche or other natural phenomenon, the responsibility lies with the inhabitants of Khorog themselves. Moreover, there are no available lands to which resettlement could be directed in accordance with hazard safety data. Therefore, it can be argued that there is no practical regulation on the issue of resettlement in Khorog.

Although national and regional authorities, policies and infrastructure codes exist, there are often challenges to implementation on the local scale, particularly considering the extremity of vulnerability in the city. The National Strategy for Adaptation to Climate Change of the Republic of Tajikistan for the period to 2030 is supported by Article 18 of the Constitutional Law of the Republic of Tajikistan, which was approved by Government Decree on October 2, 2019. The Department of Ecology for the region is the responsible body for environmental issues. National strategies and laws are integrated to some degree at the local level in the city masterplan. However, there is no legal requirement to assess environmental vulnerability of plans at the local level. Due to the hazard vulnerability of all land in Khorog, the hazard risk assessment and alignment of local to national standards on climate change adaptability may prove challenging.

An example of this is the re-housing process in the event of a natural risk. Although this process is part of the national Land Code, the lack of available land to be allocated in this process makes this a local challenge for Khorog. In many cases, due to the prevalence of risk-prone land within the city, infrastructure and housing is built on land that has been recently impacted by hazards. Therefore, alternative standards and approaches may need to be considered to support local needs with respect to natural risk and climate change adaptation.

Analysis of legislation and leading actors in the fields of urban planning, land and climate issues and their scope of responsibilities, particularly in Khorog, demonstrate more the above issues more clearly. The general structure of the system identifies the rights of both citizens and organizations involved in urban planning, land and climate issues.

It is determined that Khorog being a mountainous city carries its own particular risks to planning in particular parts of the city. Its planning should include optimal placement and interconnection of optimal zones, rational structuring of territories in conjunction with the system of public centres, engineering and transport infrastructure, creation of various types of urban environment, meeting the needs of different groups of the population, effective use of the territory, consideration of architectural and urban planning traditions, climatic and other local features, as well as protection of the environment, and monuments of history and culture.

As regulation is articulated vertically in Tajikistan, cities including Khorog need to adhere to national regulations with the possibility to develop their acts in accordance with generally established rules. Such practice within an extensive system of planning approval increases the overall time spent on regulatory processes.

Fig 104. Private house in the mountainous area of Imomobod 1

7

SUMMARY AND NEXT STEPS

7.1. BLUE-GREEN NETWORK

7.1.1. Land Cover

This report is the culmination of activities 1.1 and 1.1.2 in the Discovery and Understanding phase of the project. This first part of the city profile includes an analysis and diagnosis section. This report provides a profile of Tajikistan at national, regional and city scale. It does this with a focus on resilience, through legislation, urban economy, and urban planning parameters, with a number of sub-themes. This categorisation ensures that data is collected and compared in a methodical way, giving an integrated and comprehensive understanding of the city and its spatial, political, physical and historical context.

The spatialization of data and analysis of the city context in this part (1) of the city profile will be followed by a triangulation of data sources and a forecast assessment and diagnosis within part 2 of the city profile report, and will be developed in parallel with a validation workshop and training session. Part 2 of the city profile will, therefore, focus on the challenges and opportunities within the city.

This report provides a basis of understanding that aims to highlight gaps for justification and further discussion with stakeholders.

This report was formed from predominantly spatial data sets, financial data, assessment of legal frameworks and public sources. Datasets were gathered in collaboration with AKAH, from both government sources and international aid organization reports and studies. Some data was not accessible. This was due to sensitivity of local and national government information, or cases in which the data did not exist or was too outdated to be useful. Key data that was not accessible included the government town plan from 2010, migration data specific to Khorog, urban growth and population growth over time, and electricity supply on the city scale.

Additional challenges identified in the city profiling exercise included issues with integration and sharing of information between authorities and private organizations. This limits the ability of local authorities, international organizations, private businesses and citizens to understand and react to environmental, economic, social and infrastructural challenges in Khorog, as well as engagement from regional and national stakeholders. This has a limiting effect on both the quality of plans for Khorog and the ability for plans to be implemented at the city scale.

Specific challenges and opportunities that will be considered in the diagnosis phase include:

Governance and Management

- Applicability of national laws on a city level due to extremity of land scarcity and natural hazards
- Management and governance of water sources for water and electrical supply
- Lack of unified governance and vision for the city
- Limited management of housing construction
- No pooling of data or research to unify city strategies and ensure adequate basic services
- No management of basic urban services (water)

Socio-economic

- Unemployment and large youth demographic
- Proximity to unstable parts of Afghanistan and legacies of violent conflicts, increasing fragility risks
- Increased migration and emigration due to humanitarian and environmental disasters
- Few opportunities for women to overcome poverty
- Heavy reliance on remittances
- Heavy reliance on donor aid in financing economic projects
- Increased employment and activity in the tourism sector in GBAO

Infrastructure and Basic Services

- Outdated/poor quality infrastructure
- Inadequate infrastructure in energy and transport, increasing trade costs and access to nearby markets
- Declining education attainment rates, increasing dropouts and gender imbalances
- Presence of renowned academic institutions in Khorog
- Unique religious and cultural identity in the presence of religious facilities and maintaining cultural traditions in Khorog
- Integrating new development and ensuring it meets local demand
- Connectivity with nearby urban centres
- Limited mobility preferences and heavy reliance on roads
- Lack of access to basic urban services
  - water, sewage and electricity supply

Spatial and Environmental

- Urbanization and land scarcity
- Natural hazards and increased unpredictability with climate change
- Location and geological processes increase Khorog's risk against natural hazards and disasters
- Limited integration of climate change into urban planning
- Lack of information and monitoring of impacts of climate change
- Limited ability to mobilize resources at short notice to respond to natural disasters

Fig 105. Private house in the mountainous area of Imomobod 2

Fig 106. Cross border market

8

ANNEX

8.1. TOOLS

8.1.1. Resilience Profiling Tool

UN-Habitat's City Resilience Profiling Tool (CRPT) provides a cross-cutting diagnostic for resilience-based urban development. The tool was developed to provide a holistic approach to building resilience across the entire urban area to all shocks and stresses. The tool provides a framework for data collection, identifying relevant stakeholders and plausible shocks and stresses to allow a preliminary identification of gaps and opportunities over a series of different aspects regarding the city's structure and functionality, while also providing a baseline for future actions.

The tool follows a multi-sectoral, multi-shocks and stresses, and multi-scale approach to emphasize that cities function as urban systems that are integrated and interdependent. It has been designed to collect information to provide a resilience profile, evaluate urban resilience through a diagnostic methodology, and develop Actions for Resilience (A4R) that are tailored to each city. The Actions for Resilience provide a roadmap for local governments to initiate positive changes through preventive actions and hazard assessment, combining risk reduction measures, vulnerability reduction measures and improvement capacity-building in sustainable development.

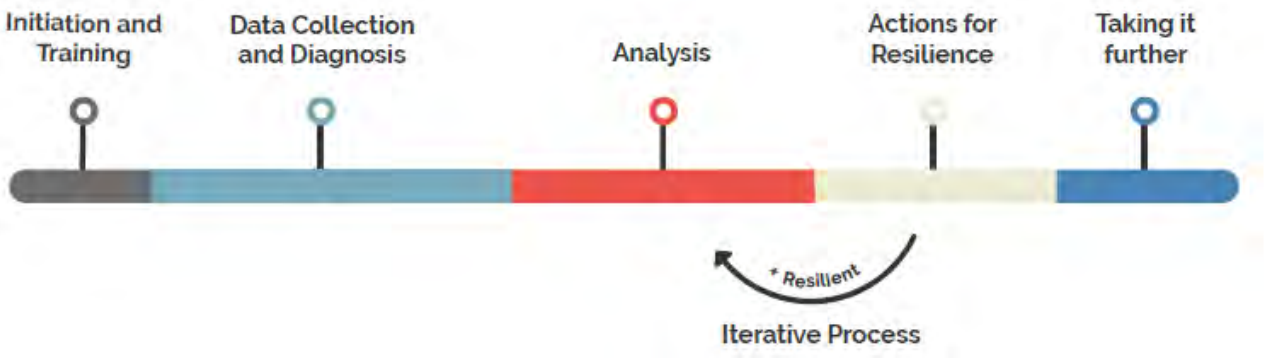

Fig 107. Steps towards implementing CRPT

8.1.2. City Resilience Action Planning (CityRAP)

The City Resilience Action Planning (CityRAP) Tool, developed by UN-Habitat, aims to enable local governments of small to intermediate sized cities, or neighbourhoods/districts of bigger cities or metropolitan areas, to plan and undertake practical actions to strengthen the resilience of their cities. The CityRAP tool is process-based and puts local governments and urban stakeholders in the centre of urban resilience planning from Day 1, with its key principle being bottom-up planning.

The tool identifies five pillars to resilience: urban governance, urban planning and environment, resilient infrastructure and basic services, urban economy and society, and urban disaster risk management. It is divided into 4 phases as described in figure 99.

The tool was initially developed for city authorities and local governments and includes a set of training exercises and activities, with an application process of two to three months. However, various concepts of the tool have been used throughout UN-Habitat's work in Khorog, including the conceptual understanding of resilience and its various components, survey questions and diagnostic tools. This does not only provide a structure to UN-Habitat's work, but can also acquaint local governments with the tool, for cases in which it is pertinent to develop further actions from its parameters.

Fig 108. CityRAP's phases and duration.

8.1.3. Making Cities Resilient

The UN Office for Disaster Risk Reduction (UNDRR) and its partners launched the 'Making Cities Resilient' (MCR) Campaign in 2010, to raise awareness on urban risk reduction with city leaders and local governments, and to promote collaboration with local partners, grassroots networks and national authorities. As part of the campaign, the "Ten Essentials for Making Cities Resilient" were developed to provide basic building blocks for understanding disaster resilience at local levels. These guidelines were adapted and aligned to the Sendai Framework for Disaster Risk Reduction (2015-2030). The Ten Essentials are critical and constitute independent steps that required to build and maintain resilience. These are grouped into three categories: governance and financial capacity, integrated planning and disaster preparation, and disaster response and post-disaster recovery.

8.1.4. Disaster Resilience Scorecard for Cities

UNDRR have also developed the Disaster Resilience Scorecard for Cities, with support from the European Commission, IBM, AECOM and other partners and cities participating in the Making Cities Resilient Campaign. The scorecard provides a set of assessment criteria that assist local governments in evaluating their disaster resilience based on the Ten Essentials described in figure 100. UNDRR's sub-regional liaison office for Central Asia, located in Kazakhstan, has been contacted during the development of the Khorog City Profile. The outcome of this engagement identified that the UNDRR sub-regional liaison office is currently implementing the scorecard in 5 cities in the region, including Dushanbe. Continuous coordination with the office was therefore, identified as essential for the development of the profile and lessons learned from the implementation of the scorecard will be taken into account throughout the program.

8.1.5. UNDAF

UN-Habitat will contribute to the outcome of the strategic focus area "Resilience and Environmental Sustainability" of the current United Nations Development Assistance Framework (UNDAF), agreed between the Government of Tajikistan and the United Nations on 18 December 2015. UNDAF (2015-2020) aims to reinforce a strong partnership between the Government of Tajikistan and the United Nations Country Team (UNCT), to achieve the Sustainable Development Goals (SDGs) by advancing equitable economic growth and reducing poverty, human rights protection and promotion through capacity development, strengthening of strategic and policy frameworks, enhancement of accountability systems (including in relation to UN human rights machinery), and the delivery of quality social services.

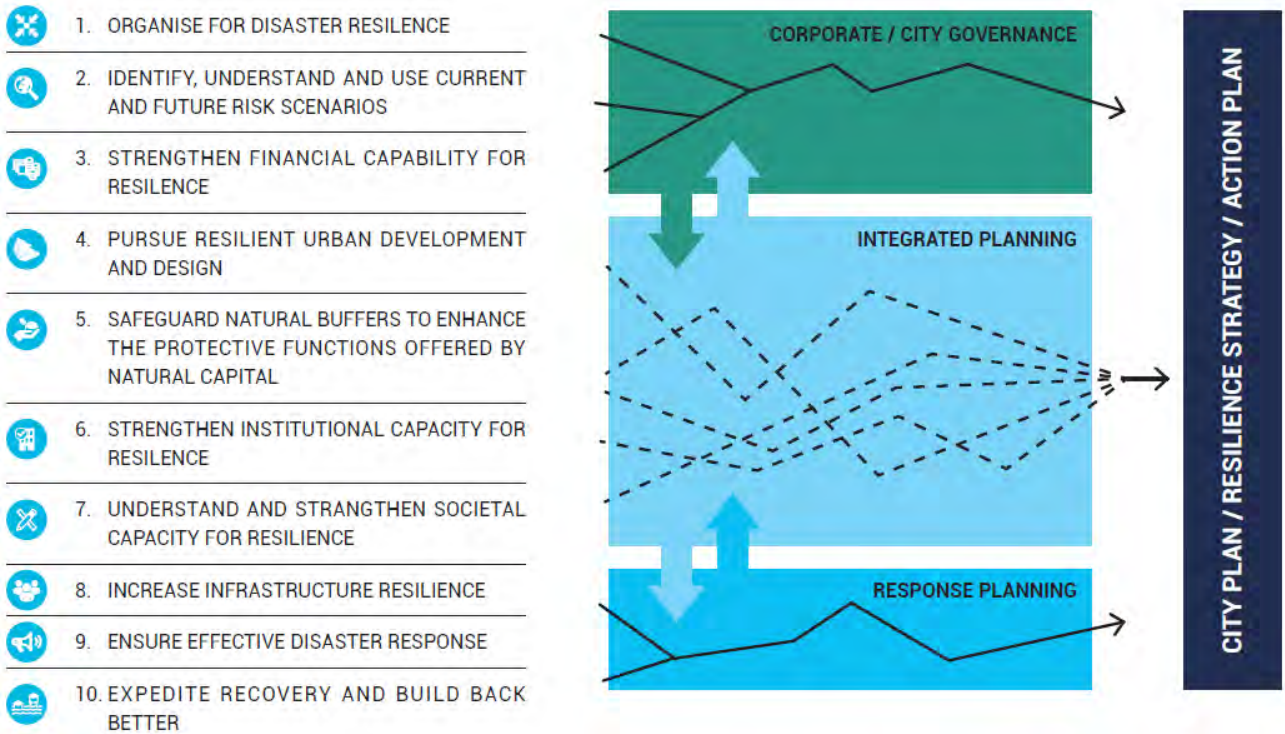

Fig 109. The Ten Essentials for Making Cities Resilient

Through this project, UN-Habitat has maintained constant communication and coordination internally between the Urban Lab - Planning Finance and Economy Section (PFES), the Program Development Branch, Project Coordination Office for CIS Countries in Moscow, as well as the United Nations Resident Coordinator's Office (UNRC) and United Nations Country Team (UNCT) in Tajikistan. This has allowed for a broad understanding of UN-Habitat's contribution to Tajikistan's achievement of the SDGs, in consultation with the other agencies that are engaged in this country in relation to the upcoming cycle of UNSDF.

8.2. INTERVIEWS

In order to gain an understanding of the current context, UN-Habitat, in collaboration with AKAH, conducted a series of interviews with the following stakeholders.

- The Governor of GBAO
- The Mayor of Khorog
- A representative from Chorboh (Khorog city park)
- A representative from Botsad research institute
- A representative from Pamir Energy
- The Committee for Architecture and Construction
- OJSC Shahrofar
- The Head of Architecture for the UCA development; Dastanbui M. Mamadsaidov

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Integrated Spatial Plan for Environmental and Socio-Economic Resilience

KHOROG
Tajikistan

City Profile Part 2
Diagnosis Report

September 2021

UN HABITAT
FOR A BETTER URBAN FUTURE

Aga Khan Agency for Habitat

Habitat Planning
A Programme of the Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience
Khorog, Tajikistan

Diagnosis Report

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Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

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Integrated Spatial Plan for Environmental
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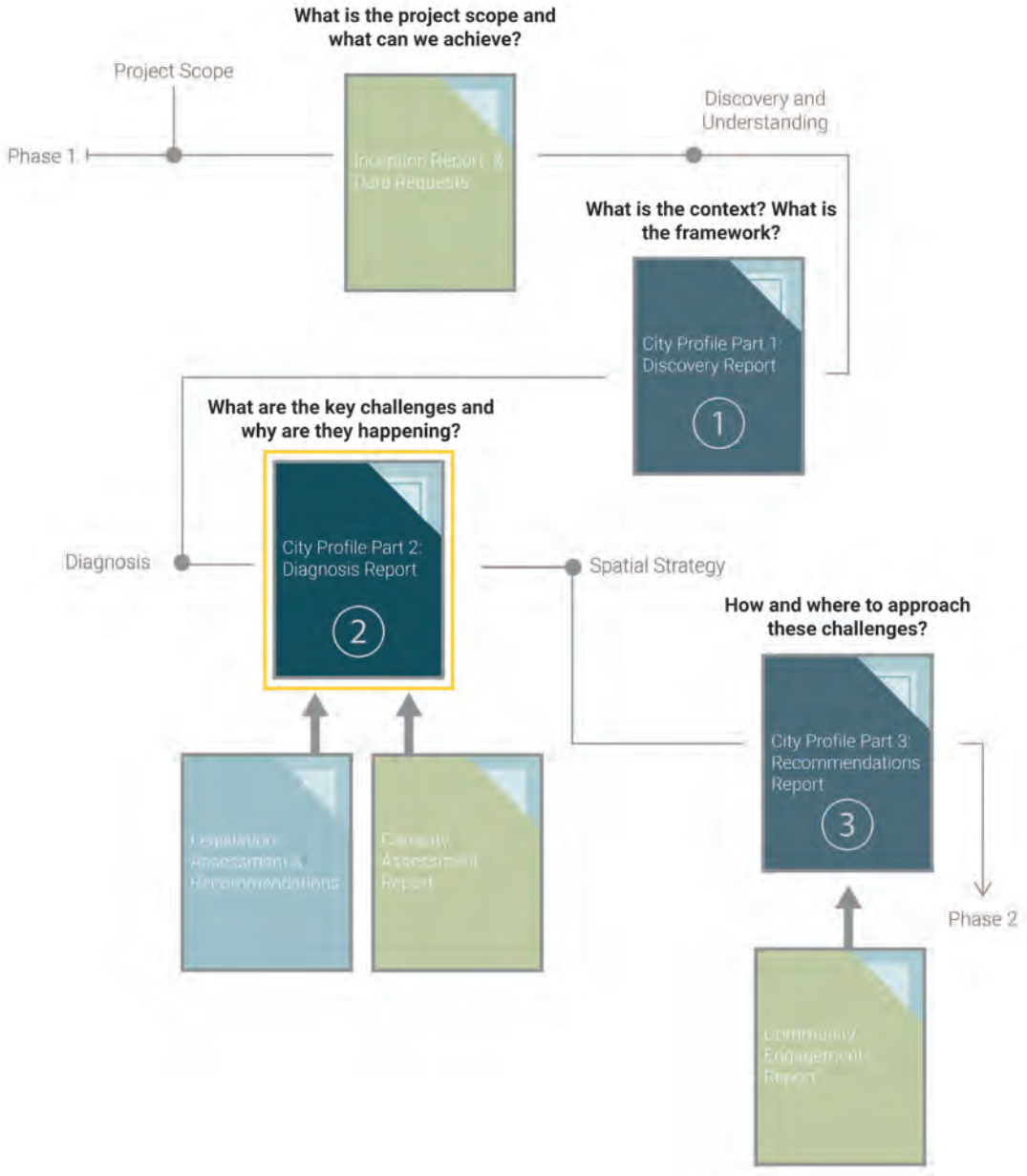
Diagnosis Report



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ACRONYMS

AKAH	Aga Khan Agency for Habitat
AKDN	Aga Khan Development Network
AKES	Aga Khan Education Service, Tajikistan
AKF	Aga Khan Foundation
AKFED	Aga Khan Fund for Economic Development
AKHS	The Aga Khan Health Service, Tajikistan
AKL	The Aga Khan Lycée
AKTC	Aga Khan Trust for Culture
CityRAP	City Resilience Action Planning Tool
CNRM	Certificate Programme in Natural Resources Management
CRPT	City Resilience Profiling Tool
EBRD	The European Bank for Reconstruction and Development
GBAO	Gorno-Badakhshan Autonomous Region
GoT	Government of Tajikistan
HPP	Hydro-power Plant
HVRA	Hazard Vulnerability Risk Assessment
MGB	Mcfarlane Green Biggar Architecture + Design
PAT	Plan Assessment Tool
PIUP	Participatory Incremental Urban Planning
PWD	Persons with Disability
SECO	Swiss State Secretariat for Economic Affairs
UCA	University of Central Asia
UN	United Nations
UNDP	United Nations Development Programme
UNDRR	United Nations Disaster Risk Reduction
UNECE	United Nations Economic Commission for Europe
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational Scientific and Cultural Organisation
UNRC	United Nations Resident Coordinator's Office
UNCT	United Nations Country Team
UN-Habitat	The United Nations Human Settlements Programme
USAID	United States Agency for International Development
WFP	World Food Programme

A view over Tem, in the North West of Khorog © UN-Habitat

1

INTRODUCTION

1.1. INTEGRATED SPATIAL PLAN FOR ENVIRONMENTAL AND SOCIO-ECONOMIC RESILIENCE

UN-Habitat has partnered with the Aga Khan Agency for Habitat (AKAH) and the government of Tajikistan, through the Aga Khan Development Network (AKDN), to undertake the 'Integrated Spatial Plan for Environmental and Socio-Economic Resilience' in Khorog Tajikistan. UN-Habitat's Urban Planning and Design Lab (Urban Lab), in a collaborative process with other units and branches within the UN-Habitat Planning Finance and Economy Section and the Urban Practices Branch and with AKAH's Habitat Planning teams in Geneva and Tajikistan, aims to provide planning direction to improve resilience and social stability for existing communities and accommodate the increasing populations in Khorog in a sustainable way through:

1) developing strategies, masterplans, interventions, and regulations.
2) knowledge creation, capacity building, and guidelines.

More specifically, the project aims to provide environmental, legal, economic, spatial and infrastructure policies and projections, governance and management, recommendations for transformative projects, and planning and technical capacity building for stakeholders. The UN-Habitat, in concert with AKAH's Planning methods and advanced data collection and analysis, provide planning expertise, drawing on existing methodologies, toolkits, and best practices in a collaborative and integrated way to guide the growth of Khorog.

This project is one of several outcomes from an assessment of resiliency that was undertaken for Khorog in 2017 and 2018 by the Swiss State Secretariat for Economic Affairs (SECO) and Holinger, with partnerships from the international community that include the European Union for resilient infrastructure, the Government of Japan, the IFC and World Bank.

The work of UN-Habitat in collaboration with AKAH is part of The Khorog Urban Resilience Planning and Proof of Concept Initiative, supported by SECO to drive resilient infrastructure investment and access to basic public services, intended to reducing risk, ensure more reliable infrastructure and a safer environment. This will, in turn, improve economic growth and wellbeing. This project has been undertaken in parallel with other initiatives for Khorog, such as the EBRD and SECO funded phase 1 and 2 water infrastructure projects.[01]

AKAH looks to UN-Habitat to support the Revised Town Planning process in a way that can ensure alignment of the town plan to UNDRR resilience principles and best practices. The integrated plan for environmental and socio-economic resilience in Khorog will integrate the disaster risk reduction approaches within the planning processes of identified projects.

1.2. APPROACH & METHODOLOGY

1.2.1. City Profile Part 2 Diagnosis in Context

PHASE 1	**Scoping, Analysis, Diagnosis and Spatial Strategy**			**Deliverables**
	Project Scope and Inception Report	What is project scope and what can we achieve?	This involves a review of existing reports and studies on the city, through desktop research. This formalised the project scope and clarified next steps. It also identified gaps in available information and key stakeholders for interviews. As a result, requests for specific and updated data sets (GIS and other) were made.	• Inception Report • Data request
	Discovery and Understanding	What is the context? What is the framework?	Stakeholders were involved at this early stage, through discovery interviews. As resilience was the focus of the project, findings were directed by and filtered through four key areas; Environmental, Socio-Economic, Infrastructure and Basic Services, and Institutional Resilience. This first step informed the team of the challenges the city faced, and directed the next stage of assessments.	• Discovery Workshop • City Profile Part 1: Discovery Report
	Diagnostic and Community Engagement	**What are the key challenges and why are they happening?**	**This stage of work involved a data collection and cleaning process, and a series of assessments based on the spatial resilience themes; environmental, socio-economic, infrastructure and basic services. The final theme, institutional resilience, was assessed by the urban legislation team and is included as an individual chapter alongside the data assessments. This step helped the team to create a basis of understanding from which to propose focused community engagement activities, and on-site validation exercises.**	• **Diagnosis Workshop** • **City Profile Part 2: Diagnosis Report**
	Spatial Strategy	How and where to approach these challenges?	This stage of work involved consolidating the challenges faced by the city and identifying key spatial and non-spatial strategies through which to approach them. Not only can these set of plans and strategies support sustainable development in the city but an understanding of the process can also be an opportunity for local government and stakeholders to take forward an evidence-based, participatory and collaborative approach to planning.	• Validation Workshop • City Profile Part 3: Recommendations Report
PHASE 2	**Transformative Projects, Implementation Tools**			
	Transformative Projects	How to actualise the plan?	This stage in the project involves identifying key pilot project sites, to showcase practical plan implementation, how the SDGs can be localised, and how an integrated approach to development can be actualised.	
	Capital Investment Plan	How and when to implement?	This tool prioritises action plans with a finance and investment strategy to support plan implementation.	

Table 1. Project phasing (the Diagnostic phase is highlighted)

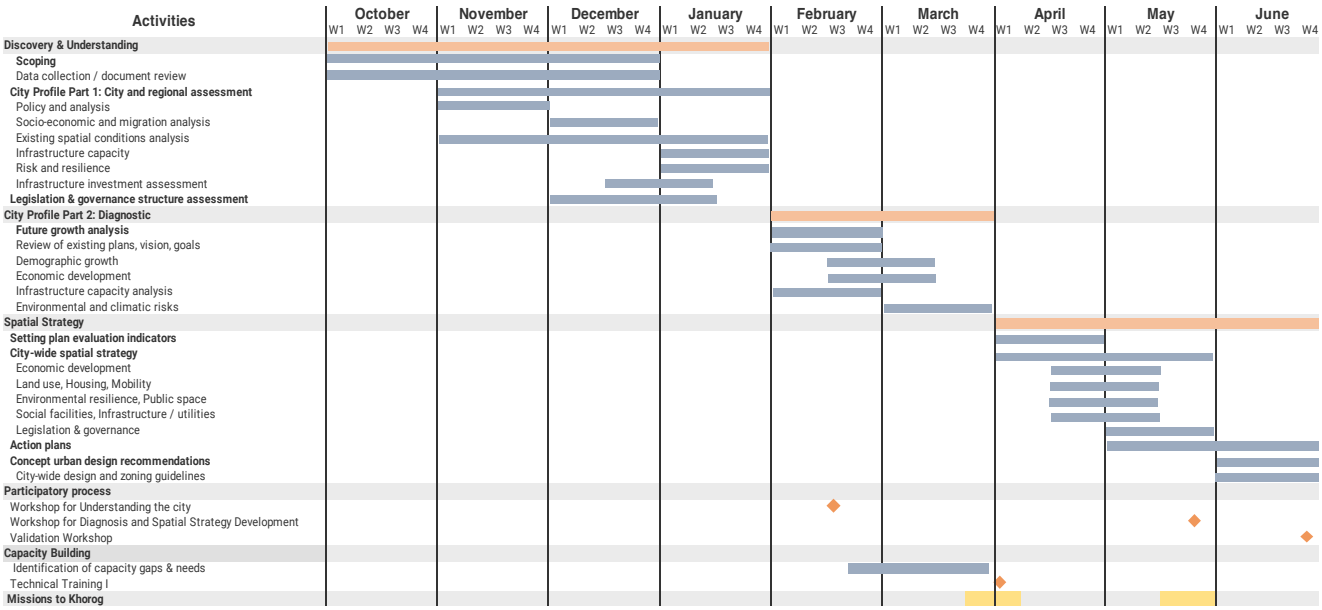


Table 2. Positioning of the diagnosis phase within the project timeline

During the discovery and understanding phase, the project teams from AKAH and UN-Habitat have consulted several authorities and a diversity of stakeholders from academia, such as the University of Central Asia (UCA) and the National Academy of Sciences of Tajikistan, the local, regional and national government, representatives from local utilities providers, and community leaders. Stakeholders include the GBAO Governor and mayor, Committee for Architecture and Construction, Head of Architecture for the UCA development, and Pamir Energy.

Data has been collected and assessed in development of the 'City Profile Part 1', both through a collaborative effort between AKAH and UN-Habitat, through extensive research, and through a community mobilization process. This data has then been shared with stakeholders as part of two 'Discovery Workshops' to identify gaps in knowledge, identify new data sources, update information and solidify existing knowledge about Khorog.

The project team then developed the findings from these outputs and activities in a 'Diagnosis' phase. This phase consisted of a series of assessments based on validated data, to grow the team's understanding about the city before undertaking a mission to Khorog that would inform following activities, gaps, and the focus of study.

Following on from this report, the 'Diagnosis Workshop', was undertaken by the UN-Habitat Urban Lab in collaboration with AKAH. This was a training session, built on a participatory Training Needs Assessment and a number of community engagements and stakeholder meetings. These inform the spatial, legislative and policy recommendations that form the final part of the project Phase I.

Data sourcing and evidence-based processes

All data within this report was sourced in collaboration with the AKAH team in Khorog. Data was collected in Dushanbe, from government sources, from meetings, interviews, the study of existing regulations and legislation in urban development and construction. Sources vary from relevant departments within the government, local utilities companies, the University of Central Asia, and studies undertaken by AKAH such as AKAH's Habitat and Hazard Vulnerability Assessments.

The population data used in this report was taken from government sources and reflects the estimated population number in 2020. This report, therefore, must be updated regularly to reflect existing population dynamics, needs, and city responses to them. In addition, hazard data was created through citizen participation and reflects local knowledge and hazard perception. This is considered adequate for the purpose of these assessments and the production of final plan recommendations, both spatial and non-spatial.

The process of data collection and the choice of assessments in this report was designed not only inform the next steps of the project, but also to provide opportunities for stakeholders to engage the work in ways that can be built upon in future. Sharing the data

and process can allow for a more participatory and collaborative planning process, which should lead to more integrated and longer lasting impact.

Structure of the Diagnosis

In alignment with Part 1 of the City Profile, the structure of the Diagnosis is based on the same resilience framework; institutional resilience, socio-economic resilience, resilient infrastructure and basic services, and environmental resilience. However, the Diagnosis begins with an environmental resilience diagnosis assessment. From the City Profile Part 1, it was understood that environmental resilience is a major challenge for the city, and has been a foundation from which the city has formed over time, and will continue to do so.

Following the resilience framework ensures not only that resilience be the fundamental driver of assessment, but also allows it to be carried forward as the basis of spatial strategies, taking into account the definition of urban resilience in existing frameworks. Project evaluation, validation and justification processes can therefore, bring each stage of the project through this framework.

Alignment with the Habitat Planning Framework

The Aga Khan Agency for Habitat has developed a holistic approach to Habitat Planning combining urban and rural participatory planning techniques with international best practice and local expertise to help communities to design a better future. The project fits within AKAH's 8-step Habitat Planning Framework, by beginning a process of community engagement and government alignment. The project team have conducted a community mobilization exercise of data collection, and the inclusion of the civil society organisation 'Madina' in the Discovery and Diagnosis workshops.

AKAH's approach unites data-driven decision-making with the vision and voice of the community. AKAH works with communities to plan how to make their neighbourhoods, villages and towns safer and resilient and create opportunity for future generations. Through participatory practices and community-led design, the Habitat Plan captures a long-term vision of what the community aspires to be in the future. The Plan includes an analysis of future needs and trends based on existing physical, social, political, environmental, cultural and land-use practices, and proposes a spatial and land-use plan to meet the community's vision and future objectives.

Stakeholders including utilities providers, government officials and city architects have been consulted through interviews and work to align perspectives on the city's challenges and opportunities has been undertaken through the Discovery workshops and meetings held in the first official mission to Tajikistan.

This was enhanced through the second mission to Tajikistan. Training sessions and additional working groups helped to align stakeholders on key issues with the city and facilitates and spatial and strategic prioritization process. This process correlates with the Planning Priorities and Design phase of the Habitat Planning Framework.

The **Habitat Planning** Framework is the core framework that informed the project process. It was developed by AKAH, in conjunction with the Resilience Framework for Action. AKAH is an umbrella agency for legacy organisations including the Aga Khan Planning & Building Services, Focus Humanitarian Assistance, the Disaster Risk Management Initiative, the Portfolio Management Office (PMO), and the Prince Sadruddin Aga Khan Fund for the Environment (PSAKFE) as well as the habitat-related activities of the Aga Khan Rural Support Programme (AKRSP) and the Mountain Societies Development Support Program (MSDSP). AKAH is part of the wider Aga Khan Development Agency. It's mission statement is as follows:

"To address the increasing threat posed by natural disasters and climate change, the Aga Khan Agency for Habitat (AKAH) works to ensure that poor people live in physical settings that are as safe as possible from the effects of natural disasters; that residents who do live in high-risk areas are able to cope with disasters in terms of preparedness and response; and that these settings provide access to social and financial services that lead to greater opportunity and a better quality of life."

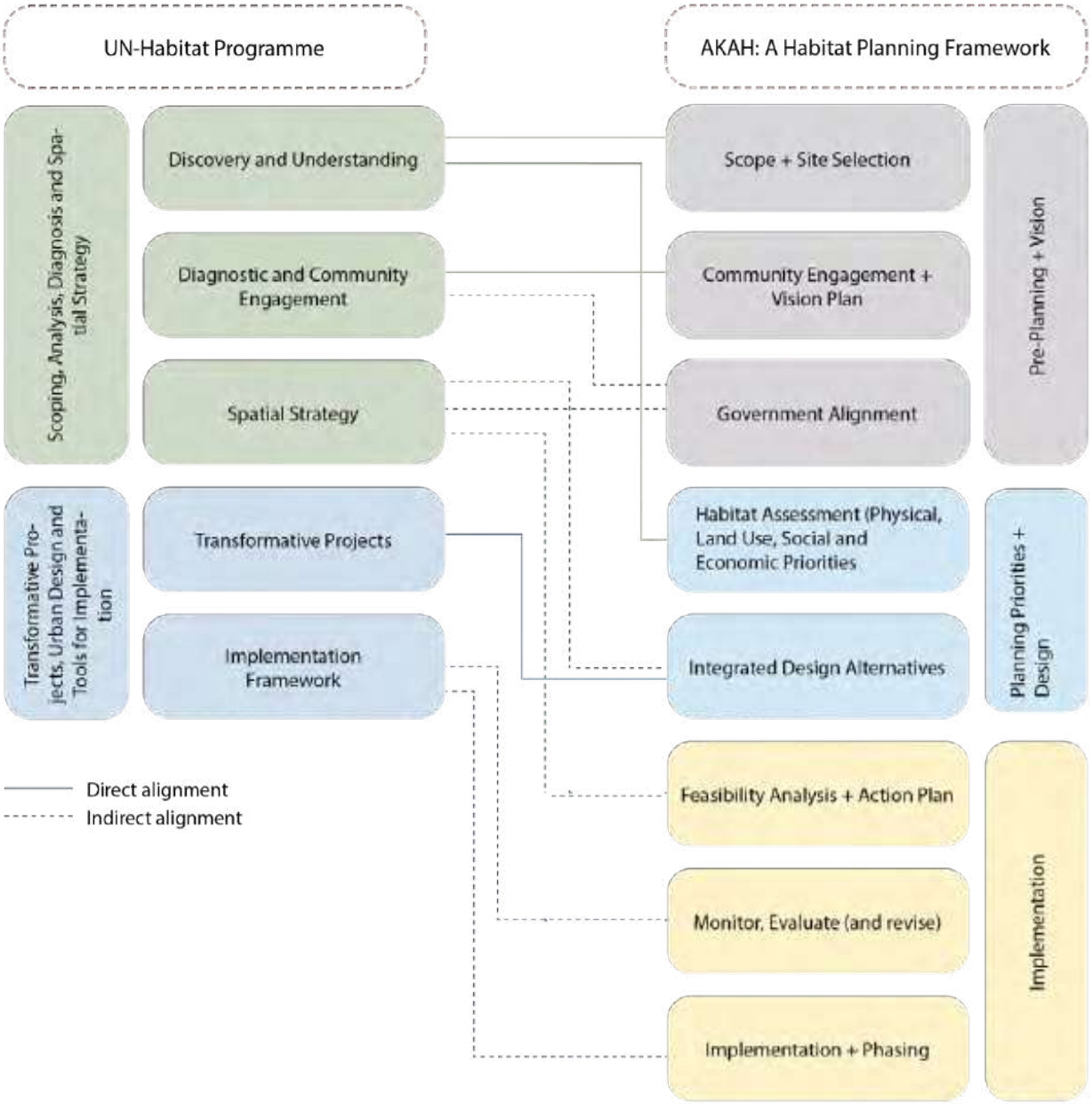


Fig 1. Alignment of UN-Habitat and AKAH's Habitat Planning Framework (using K. Intrator. Overview of Proposed Habitat Planning Process for AKAH, Version 2.0 August 2021)

The Aga Khan Agency for Habitat (AKAH) was created to address the increasing threat of natural hazards due to the effects of climate change, coupled with rapid manmade changes and insecurities have severe impacts on mountain and urban communities. AKAH created the Habitat Planning Framework in 2018 - an eight step process for assisting state or institutionally implemented mountain and rural urban planning projects through participation, data-driven decision making, design and implementation.

AKAH's eight-step process aims to assist urban planning projects in achieving the balance between the strategic planning and community action planning approaches outlined above. It also aims to set an example of enhancing the capacity of local institutions in both participatory and data-driven decision-making processes. When establishing the process AKAH reviewed the Village Development Plans (VDP) and Village Disaster Mitigation Plan (VDMP) methods used in the core target countries: Afghanistan, Tajikistan, and Pakistan. Existing spatial and nonspatial data in Afghanistan, Tajikistan and Pakistan were also analysed to understand how the process could build capacity for incorporating data collection and data-driven decision making into the method.

Pluralistic planning mechanisms and processes are required to reduce vulnerability and create a needs based planning system that will increase quality of life. This is addressed by both the Habitat Assessment and stage 5 - Integrated design alternatives.

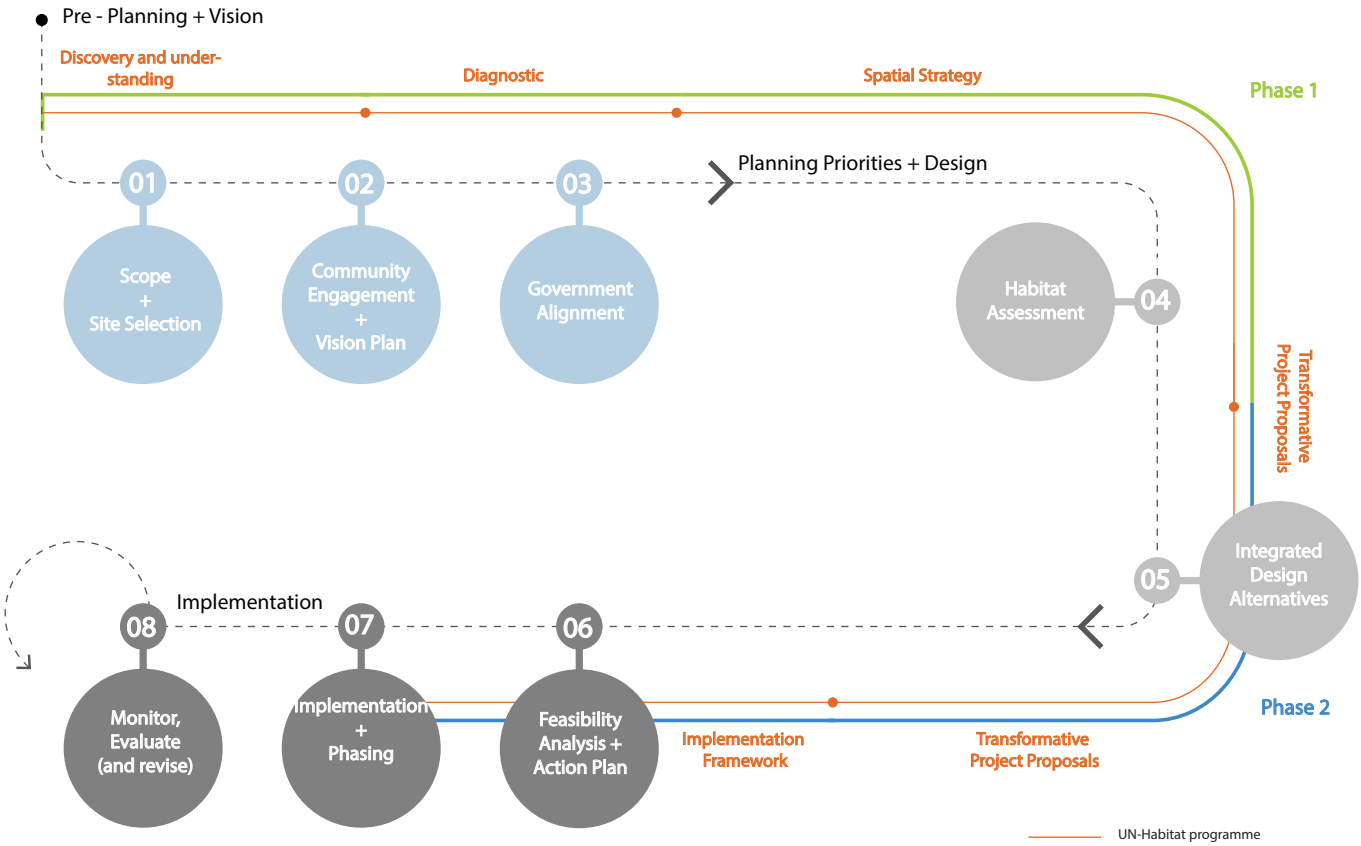


Fig 2. Planning framework (diagram built upon K. Intrator. Overview of Proposed Habitat Planning Process for AKAH, Version 2.0 August 2021)

In addition, Figure 3 shows part of the Habitat Assessment process, including the use of data collection in the capacity building and decision making processes that will be incorporated in Phase 2 of the Project (see table 1). The engagement of data driven decision making with the community's input addresses the long term local planning goals that are co-defined between the community and local authorities and can therefore be aligned and incorporated into wider urban plans. The process of using data in such a decision-making process also enhances community and institutional capacity to use data to support monitoring, evaluation, and future initiatives.

UN-Habitat's project outputs are heavily based on the knowledge and data collected by AKAH's planning team, contributing to the phases and steps of the AKAH's Habitat Planning Framework to ensure a unified, comprehensive strategic vision among all stakeholders. Figure 2 outlines the key elements of the Habitat Planning Framework, alongside the 'Integrated Spatial Plan for Environmental and Socio-Economic Resilience', to highlight the integration of approaches. Using an evaluation of both approaches, UN-Habitat's progress will be monitored against this framework to ensure alignment throughout the project timeline.

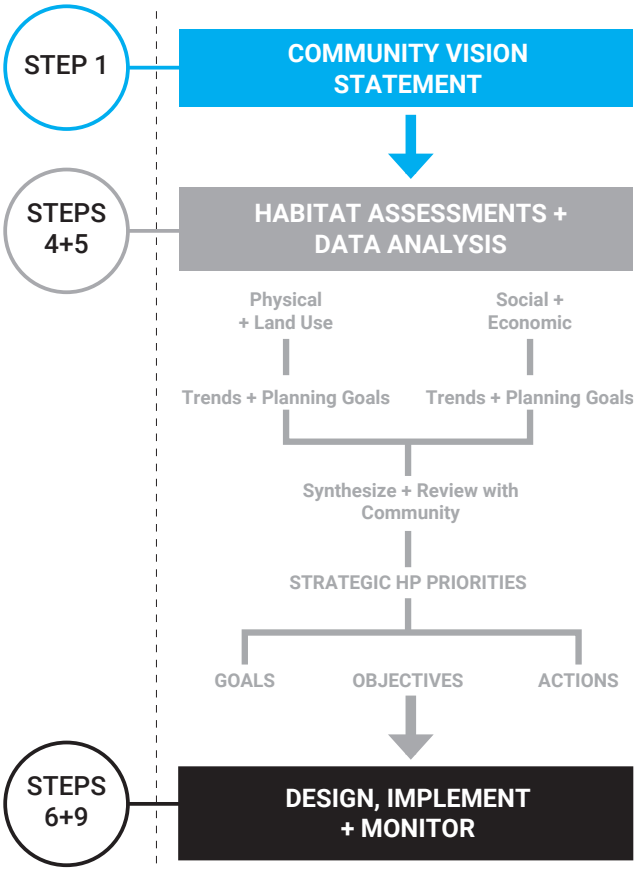


Fig 3. Strategy for developing Habitat Planning Priorities

Ismaili Center, Khorog © UN-Habitat

Alignment with Project Tools

The project tools identified in the Inception Report have been integrated into the Discovery and Diagnosis phase. Both the **City Resilience Profiling Tool (CRPT)** and the **City Resilience Action Planning (CityRAP)** Tool have been used to identify capacity gaps which have, in turn, been used to guide the training workshops and diagnosis of challenges. The training session, which took place in the second mission to Tajikistan, also used the UNDRR, "Ten Essentials for **Making Cities Resilient"** and the **Disaster Resilience Scorecard for Cities** as a guideline to structure resilience diagnosis and planning. The Masterplan Assessment Tool has also been applied and outlined in this report. Finally, aligning with the system-wide overview provided by the United Nations Development Assistance Frameworks **(UNDAF) for Tajikistan, and utilising internal** communication with the UN-Habitat Program Development Branch and Project Coordination Office for CIS Countries in Moscow, as well as the United Nations Resident Coordinator's Office (UNRC) and Country Team (UNCT) in Tajikistan over the course of the project, has given the Urban Lab a broad understanding of UN-Habitat's contribution to Tajikistan's achievement of the SDGs, and the role of the project in this context.

Participatory Incremental Urban Planning Toolbox

The Participatory Incremental Urban Planning (PIUP) Toolbox, developed by UN-Habitat, is a step-by-step methodology to assess, design, operationalise, and implement urban planning processes. The toolbox provides flexibility to adapt the methodology to various contexts, based on different necessities and focus areas. By structuring a timeline of phases, blocks and activities, the toolbox assists urban stakeholders with a more comprehensive understanding of urban planning processes. It ensures stakeholders are engaged in a meaningful way, safeguarding the ownership of completed projects and creating potential for ongoing, multi-stakeholder collaboration.

The toolbox consists of four phases, 15 blocks, and 69 activities, as illustrated in Figure 3. Each block focuses on a specific topic and is further broken down into activities to enhance the adoption of participatory, inclusive and sustainable practices. The activities are supported by innovative tools and complementary materials produced by UN-Habitat.

Applied Tools

Alongside the planning framework and PIUP, additional tools have been engaged with to align the project to best practices, processes and guidelines.

Alongside the planning framework and PIUP, additional tools will be engaged to align the project to best practices, processes and guidelines. These can also be found in the annex and include the following:

- **City Resilience Profiling Tool**
- **City Resilience Action Planning (CityRAP)**
- **Making Cities Resilient and the** "Ten Essentials for Making Cities Resilient"
- **Disaster Resilience Scorecard for Cities**
- **UNDAF**

The City Profile Part 1 and 2 align with the assessment phase of the Participatory Incremental Urban Planning Toolbox, comprised of blocks A. Contextualisation, B. Project Preparation, C. Participation set-up and D. Analysis and Diagnosis. The Spatial Strategy provided in this report aligns with both block E. Strategic Plan, and a portion of F. Conceptual Plan.

Additional tools deployed in the project processes, actions and outputs include the Resilience Profiling Tool, which has formed the framework for our assessment, City Resilience Action Planning, which was used to guarantee engagement with local actors, and the UN Development Assistance Framework, to integrate the UN Country Team in the formation of the project goals.

Alignment with Global Frameworks

While all measures proposed within the programme are targeted for implementation at city level, it is envisioned that such priorities could be replicated to

address similar challenges in other cities, and further scaled to regional and national levels. As such, the project is further strategically aligned to various international frameworks, while localising actions and recommendations.

Sustainable Development Goals

Through transformative strategies, the Khorog programme directly supports the realisation of SDG 11 on sustainable cities and communities, with particular reference to the following targets:

- 11.1: provide access for all to adequate, safe and affordable housing and basic services.
- 11.2: provide access to safe, affordable,

accessible, and sustainable transport systems; improving road safety, notably by expanding public transport.

- 11.3: enhance capacity for participatory, integrated, and sustainable human settlement planning and management.
- 11.4: strengthen efforts to protect and safeguard the world's cultural and natural heritage.
- 11.7: provide universal access to safe, inclusive, and accessible green and public spaces.
- 11.A: support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
- 11.B: increase the number of cities adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement holistic disaster risk management at all levels.

In addition, the programme also supports actions for SDG 9 on resilient infrastructure, industry and innovation, SDG 12 on sustainable consumption and production, SDG 13 on climate action, and SDG 17 on partnerships, most notably with reference to the following targets:

- 9.1: develop quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being, with a focus on affordable and equitable access for all.
- 12.8: ensure that people everywhere have the relevant information and awareness of sustainable development and lifestyles that can exist in harmony with nature.
- 13.1: strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
- 13.2: integrate climate change measures into national policies, strategies and planning.
- 17.16: enhance global partnerships for sustainable development, complemented by

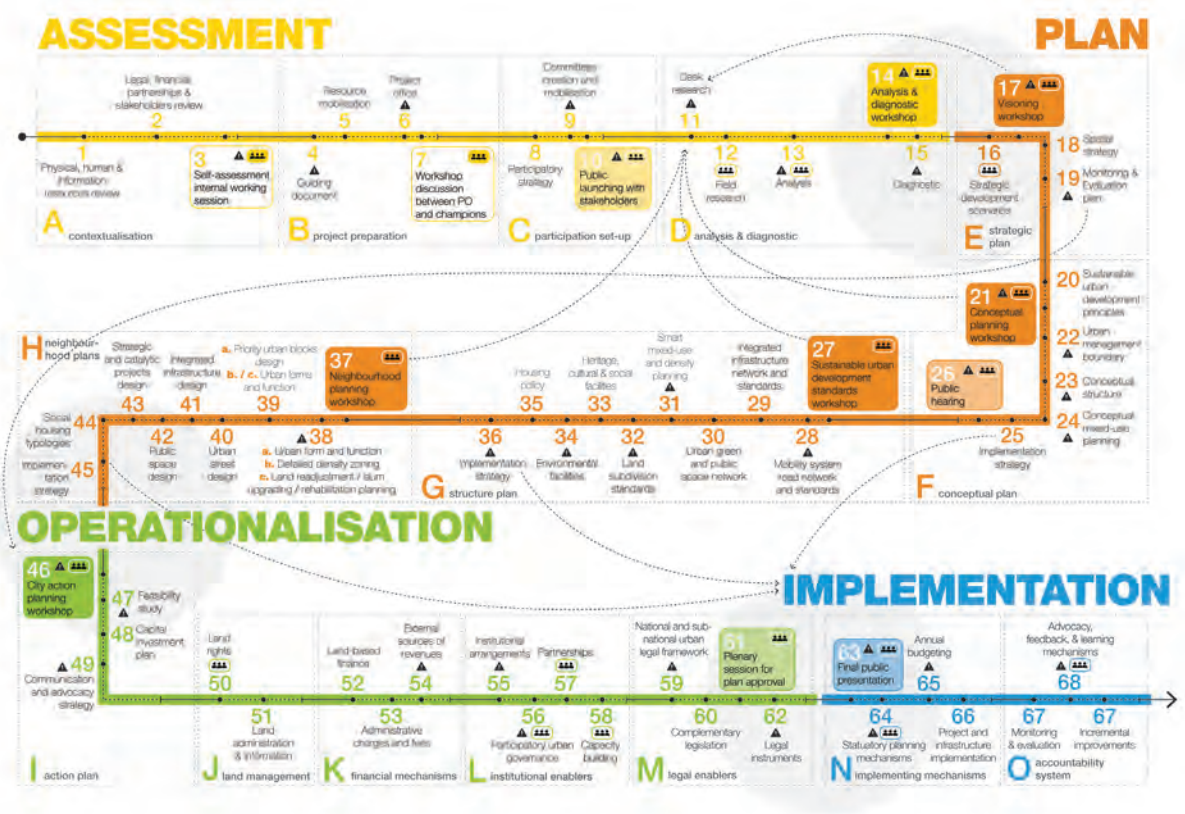


Fig 4. PIUP's phases, blocks and activities

multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources, in order to support the achievement of the sustainable development goals in all countries, and in developing countries in particular.
- 17.17: encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies that these can bring.

NUA

Tajikistan is a signatory of the New Urban Agenda, with specific commitments that are manifested in the recent adoption of the National Development Strategy to 2030, which tackles new and traditional challenges that the country is faced with. Tajikistan has built on these commitments through the adoption of the 2030 Agenda for Sustainable Development, the SDGs, the Addis Ababa Action Agenda of the Third International Conference on Financing for Development, the Paris Climate Agreement, and the Sendai Framework for Disaster Risk Reduction 2015-2030. This specific programme in Khorog aligns with the Habitat III New Urban Agenda in meeting "the challenges and opportunities of present and future sustained, inclusive and sustainable economic growth". It also aims to provide the strategic spatial framework to "adopt and implement disaster risk reduction and management, reduce vulnerability, build resilience and responsiveness to natural and human-made hazards, and foster mitigation of and adaptation to climate change".

Sendai Framework

The Sendai Framework for Disaster Risk Reduction 2015-2030 outlines seven clear targets and four priority actions to prevent new disasters and reduce risk posed by those that are existing. The Khorog programme is well aligned to the four priority areas and their key actions. It addresses priority 1; understanding disaster risk by promoting collection, analysis, management and use of relevant data to assess disaster risks, vulnerability, exposure, hazard and their possible sequential effects through the use of technological innovation and collaboration. The programme analysis of the current governance structure addresses priority 2; strengthening disaster risk governance. The programme's focus on financing and capital investment planning will ensure that prioritised measures are cost-effective and instrumental to save lives, prevent and reduce loss, and ensure effective recovery and rehabilitation. The latter point is further aligned to priority 3; investing in disaster risk reduction for resilience. Finally, through the development of building codes and demonstration projects, the project addresses priority area 4; for effective response and building back better in times of recovery, rehabilitation and reconstruction.

Paris Agreement on Climate Change

The programme's focus on resilience aligns with the Paris Agreement on Climate Change by way of increasing Khorog's resilience in an ability to adapt to the adverse impacts of climate change. Within the Khorog context, this relates directly to the adverse impacts of flooding, droughts, avalanches and landslides. Such disasters have become more frequent in the area, with growing impact.

Paris Dushanbe Declaration for the International Decade on Water Action

The Declaration of The Decade for Action on "Water for Sustainable Development, 2018-2028", was launched in an event in Dushanbe in 2018. This event and resultant declaration highlighted the importance of water access and management for the achievement of sustainable development. This challenge is of particular importance to Tajikistan, as it will affect the country's ability to create resilience in the face of natural hazards, climate change and political vulnerabilities associated with resource ownership and management. The Declaration for the International Decade on Water Action is aligned with the focus on resilience in Khorog in such a way as to facilitate the realisation of Sustainable Development Goal 6; to "ensure availability and sustainable management of water and sanitation for all".

Cross border market © UN-Habitat

View over Khorog from the Botnical Gardens © UN-Habitat

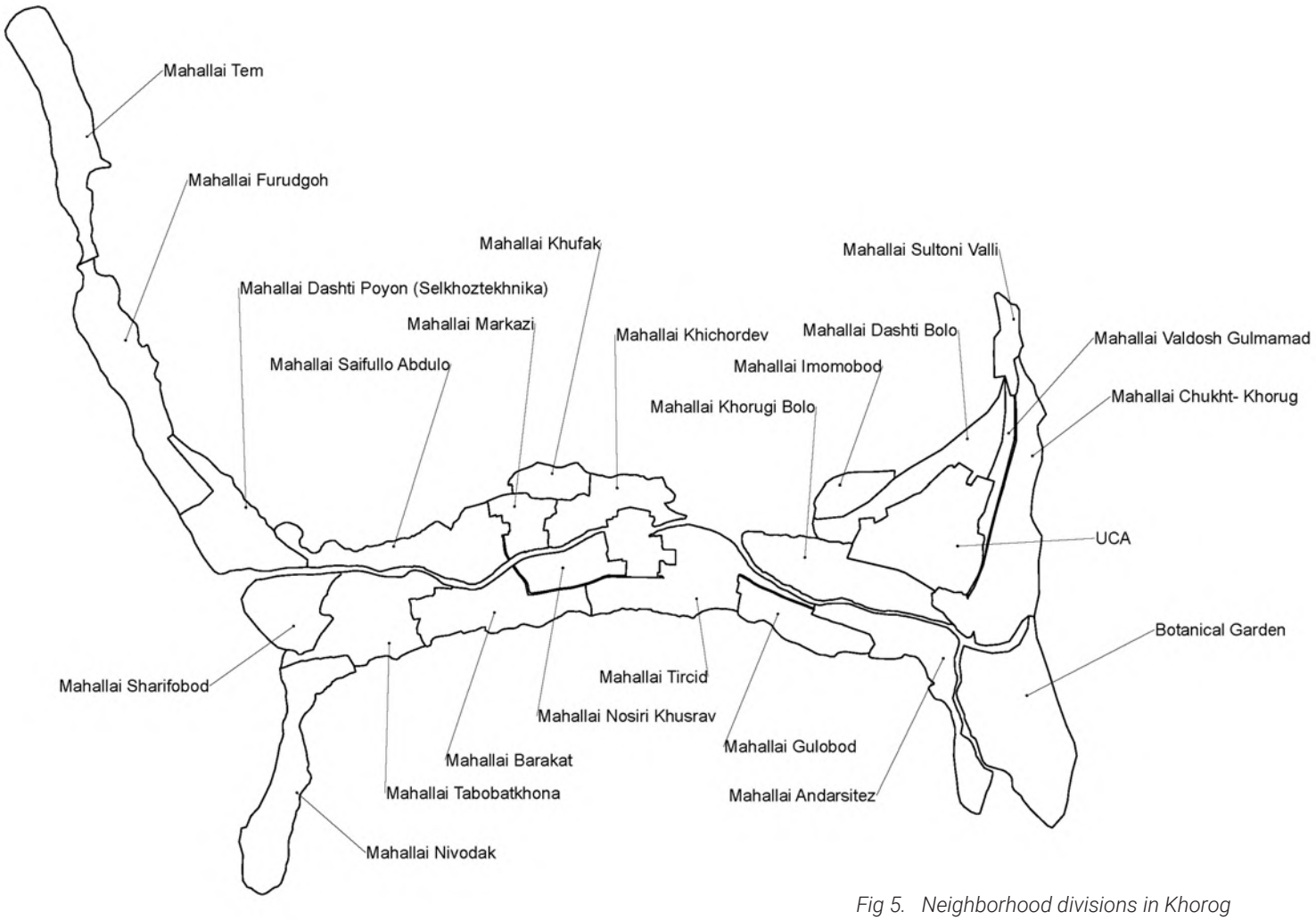


Fig 5. Neighborhood divisions in Khorog

2

DIAGNOSIS

The primary categorisation of data aligns with the territorial boundaries and local governance structure. This is based on the sub-division of the city into neighbourhoods, or Mahalla. Each neighbourhood, defined by a number of spatial and socio-economic factors, is represented by a community leader. Categorising our data and analyses in accordance with these spatial and systemic divisions helps to align our findings and more effectively contribute to existing decision-making processes in an integrative approach. The outcome of this analysis, therefore, applies to the neighbourhood-level in both assessment and recommendations.

The second level of data categorisation was according to population. Understanding the city's existing population metrics formed a basis from which to identify gaps in supply or oversupply of utilities and pubilc facilities infrastructure from both a spatial and capacity perspective. This helped to show whether the city was responding appropriately to the existing population, and how this might change over time.

Khorog's particular demographic composition is characterized as a "youth bulge", which can be an essential asset to the city's development and a driver for future socio-economic transformation. However, the high level of poverty and a lack of job opportunities, outflow of labour force to foreign countries and high dependency on remittances are significant barriers that prevent the city from leveraging such a demographic context. Khorog has both a high elderly and youth demographic, with a proportional defecit in the working-age population.

Specific demographic data at the city level was not available for this assessment, therefore, both population number and household number were considered. In assessments of data such as access to education, household number was used as a proxy. This helped to give a more accurate outcome to accessibility assessments, that account for demographic composition and population density.

Though the population growth rate remains unknown, there is an assumption that the population is growing or will grow. As it was identified by the City Profile Part 1 report, such factors as proximity to unstable areas of Afghanistan, climate change and degradation of rural areas might affect the demographic context through climate/conflict induced migration. Data suggested that the population increased by 0.6% from January 2019 to 2020 in Khorog, although there are variations in this data, which may be due in part to seasonal influx.

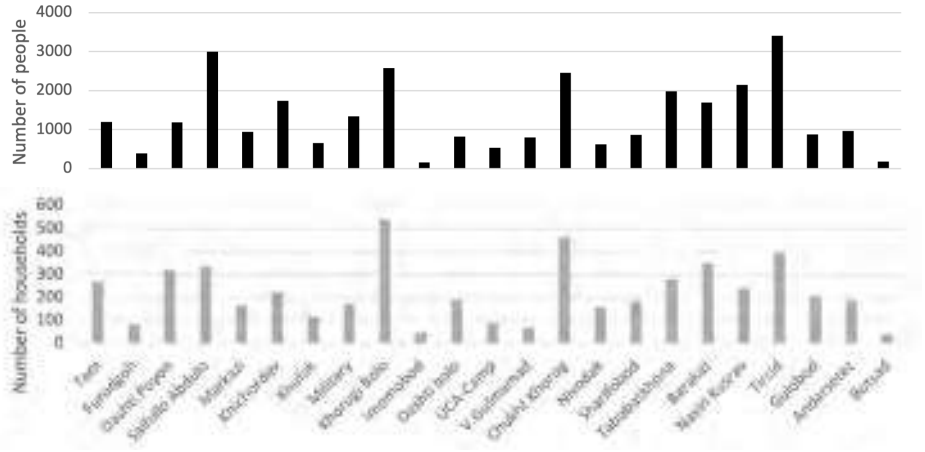


Fig 6. Number of people and households within each Mahalla

Population and Households

The population of Khorog is currently estimated to be between 30,000 and 35,000 people, and 5120 households. Tirchid has the highest number of people, whereas Khorughi Bolo has the highest household number. There is both a low population and low number of households in Botsad (due to it being a public space, Furudgoh (due to the airfield), and Imomobod (potentially due to this being an area of high hazard risk or a recent re-location settlement for those removed from the site of the UCA) .

Spatially, population growth may result in urban expansion, encroachment of slopes and development in areas affected by hazards. Limited land availability for development means that some existing structures are located within areas at risk from hazards. Densification strategies, identification of vacant land, or re-zoning can help to accommodate the increasing population in a sustainable way.

Population Density

The population density in Khorog is relatively low, in comparison to the UN-Habitat guidelines for an efficient use of utilities and facilities, which is at least 15,000 people per km^2, 150 p/ha or 61 p/acre. In Khorog, the highest density is 124 p/ha with these densest areas focused in four main neighbourhoods and accounting for 15.6% of the total population. There is a focused population density in the city core with dispersed nodes emanating outwards towards the peripheries. In the Eastern side, these nodes are in a process of consolidation and have the potential to form a corridor, whereas in the Western side, population nodes are more dispersed.

As population density was used as a basis upon which other thematic areas were layered, it was interesting to find that population density nodes did not necessarily correlate with low hazard risk, nor with economic nodes. Understanding the population density of the city helps to identifies areas in which urban growth should be limited, potential areas for infill strategies, or for those for focused hazard mitigation strategies. Such understanding can be used to develop predictions and mechanisms to guide future growth, whilst ensuring that such growth is directed by resilience agendas.

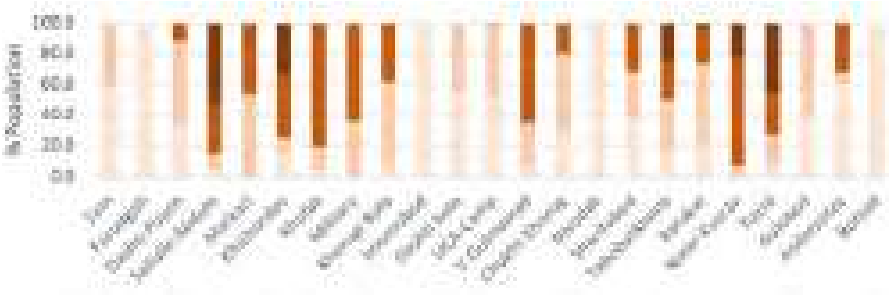
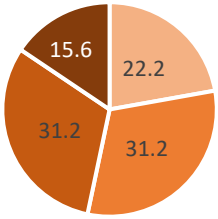


Fig 8. Population density of each Mahalla

Fig 9. Per cent of Khorog's population within each density group



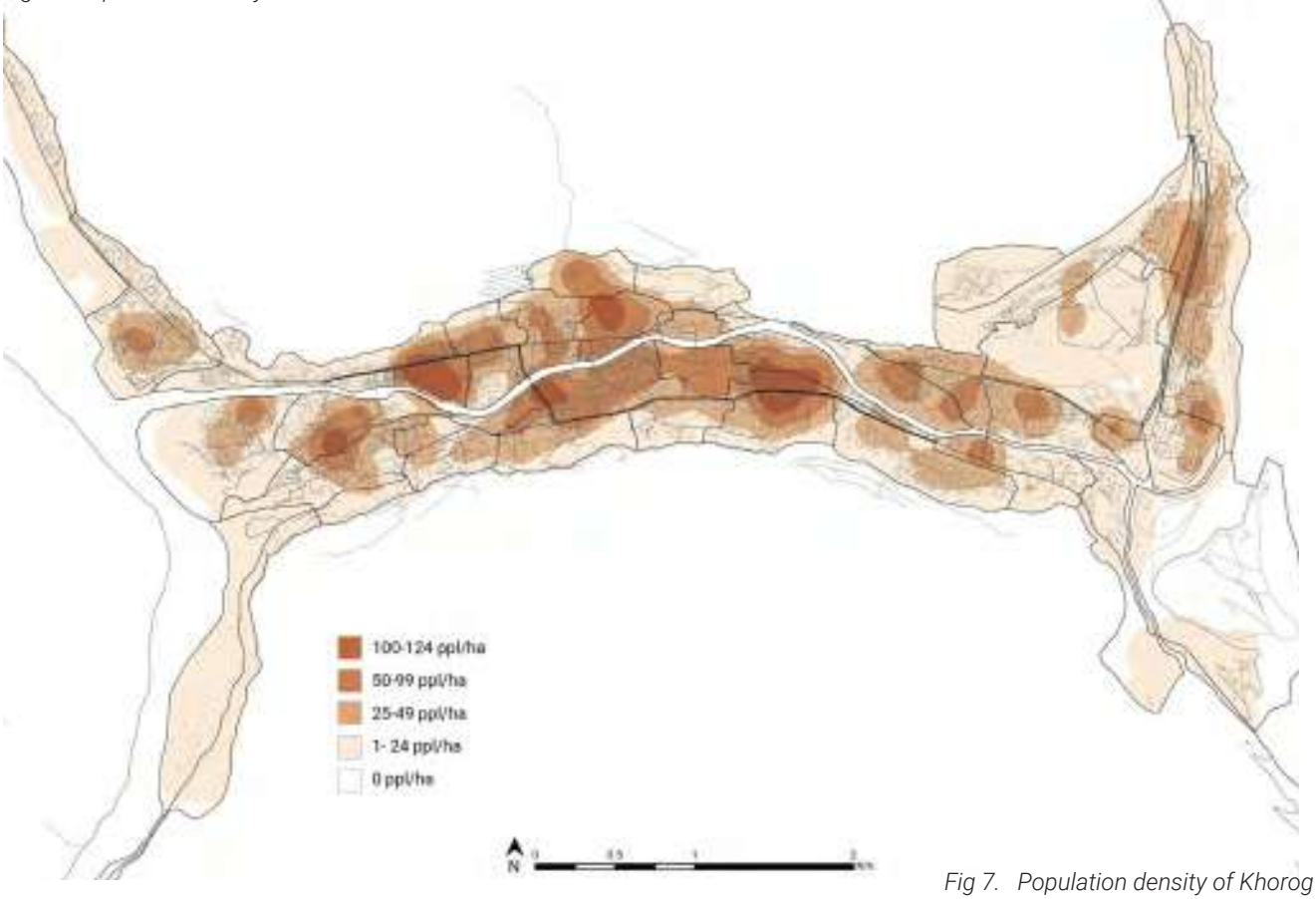


Fig 7. Population density of Khorog

Ismaili Center, Khorog © UN-Habitat

2.1. INSTITUTIONAL RESILIENCE

Local Development Agendas and planning instruments

Currently there are multiple efforts in place to improve resilience in Khorog, however, there lacks a comprehensive strategy to unify the various initiatives. To address the need for a comprehensive development strategy that can address current challenges, the Aga Khan Trust for Culture (AKTC) issued a Masterplan, which began in 2010 and was completed in 2017. Despite some alignment between the AKCT efforts and government plans, the Masterplan has not been implemented.

The only legal instrument guiding territorial development, created by the national government's planning and design agency, 'Shahrofar', is the 'General Plan' (2010). The zoning plan of which has been shared with the project team, however the main planning documents have not been, due to their classified nature. As learned from a validation session with technical experts and a working session with the Shahrofar government planning and design agency, the document requires updating and actualizing according to current needs.

The "static" nature of the General Plan may inhibit its rapid adaptation to the changing context. Understanding this informed the project team to ensure that the planning approach was more strategic, meaning that plans could complement the General Plan, forming a basis for actualization but be adjusted according to new data.

An assessment of the AKTC plan has been undertaken to identify gaps or limitations and to build on the embedded planning process and outcomes. This assessment, using the 'Plan Assessment Tool' (PAT) can be found in the first annex of this report.

An in-depth diagnosis of the current legislation and planning process has also been undertaken by the Urban Legislation unit. This legislative assessment, together with this spatial analysis, forms part of the diagnosis phase of the project. This legislative assessment is provided as an external, supportive document.

Housing in the North of Khorog © UN-Habitat

2.2. ENVIRONMENTAL RESILIENCE

Environmental resilience is a major challenge for the city due to its relatively isolated location, the number and impact of hazardous events, limited monitoring, limited centrally-run pre-warning systems, and limited collaboration between mitigation efforts and financial support or planning.

Natural Hazards are an important issue for the city to acknowledge in the planning process, due to the frequency, diversity, and intensity of hazard risk and impact, but also as there is limited land availability, a growing population, and climate change will likely lead to increasing impact and frequency of hazardous events. This can put key infrastructures and people at risk in the short, medium and long term.

The environment at large has informed how the city has developed over time, not only through the threat of hazards and limitations imposed by the dramatic terrain, but also through events of climate change related migration and reliance on hydropower. Therefore, it was important to consider what the challenges to environmental resilience are, and how they impact the city.

To do this, a number of assessments were undertaken, based on the following:

- The kinds of hazards that impact the city and the areas that are impacted (using data from AKAH's integrated habitat assessments collected in 2020)
- The 'intensity' of the hazards (high, medium, low).
- The 'impact' that the hazards have.
  - This analysis is developed as a figure of population affected per hazard (which includes population in overlapping areas) and where they are in the city.
  - It is also demonstrated through the amount of land impacted by a hazard (area in hectares).
- Frequency of hazard (from frequent or <10 years, generational or 10-30 years, to rare or >30 years).

This assessment not only considered those areas at the highest risk but also looked at areas of the city facing risks that are constant but low, for example riverbed erosion. It also considered areas of the city that experience rare but high impact hazardous events.

Therefore, this assessment was able to identify how or whether the city is able to respond to hazards and how resilient the city is to the impacts of its environment. Table 3 identifies specific 'priority areas' for action at a neighbourhood level, and the specific mitigation responses appropriate, based on hazard type, the amount of area and people affected, as well as the frequency and intensity of events.

Data from this hazard assessment was gathered from the community by the AKAH team, making this perception assessment possible despite the lack of a single official hazard monitoring system.

Type of hazard and areas impacted

Northern areas of the city face rockfall and landslides and there are concentrated occurences of avalance in the South. People and infrastructure in proximity to the river are impacted by flooding and riverbed erosion. Flooding occurs most frequently as a result of river overflow and can be observed in Tem and Sharifobod as well as in the central area of the city where basement flooding is found in residential blocks as a consequence of the river's high water levels during the summer months. Ground water flooding, however, occurs due to saturation of ground soil is areas close to the river or poorly insulated water channels that leak. For example, in Chukht Khorog, a water canal runs from the Northeast corner into the hydropower plant. It lies on raised ground, which means that in instances of leaking, houses on the lower ground at the Eastern side of the channel experience ground water flooding. The ground in these areas is unable to absorb this water, and therefore, the occurrence generates risks to building foundations and agricultural land.

The occurrence of rockfalls and landslides is due to the type of soil and gradient of the slopes surrounding the city. Landslides and rockfalls generally occur at times of specific seasonal changes, usually at the start of spring. Communities are able to monitor these events in concurrence with these temperature shifts. Although there is no centralized evacuation or support system, volunteers from AKAH and the community alert residents, and Mahalla leaders have access to a storage of safety equipment.

Finally, the location of Khorog within the tectonic belts of the Pamir Mountains means that earthquakes constitute a major challenge to the city. Regular earthquakes occur in the region and are monitored nationally by the Committee of Emergency Situations and the Institute of Geology, Seismic Engineering and Seismology. Earthquakes are linked with other hazards as they, even with a small intensity, can cause rockfalls and avalanches. Detailed assessments regarding seismic activity was not accessible for this diagnosis, therefore limitation to development in certain areas of the city was not assessed. However, a number of measures, including building heights, allocation of safe havens, the role of early warning systems and community awareness training and support, infrastructure improvements (such as to bridges for connectivity and basic service provisions) for emergency response, have been considered within part 3 of the city profile.

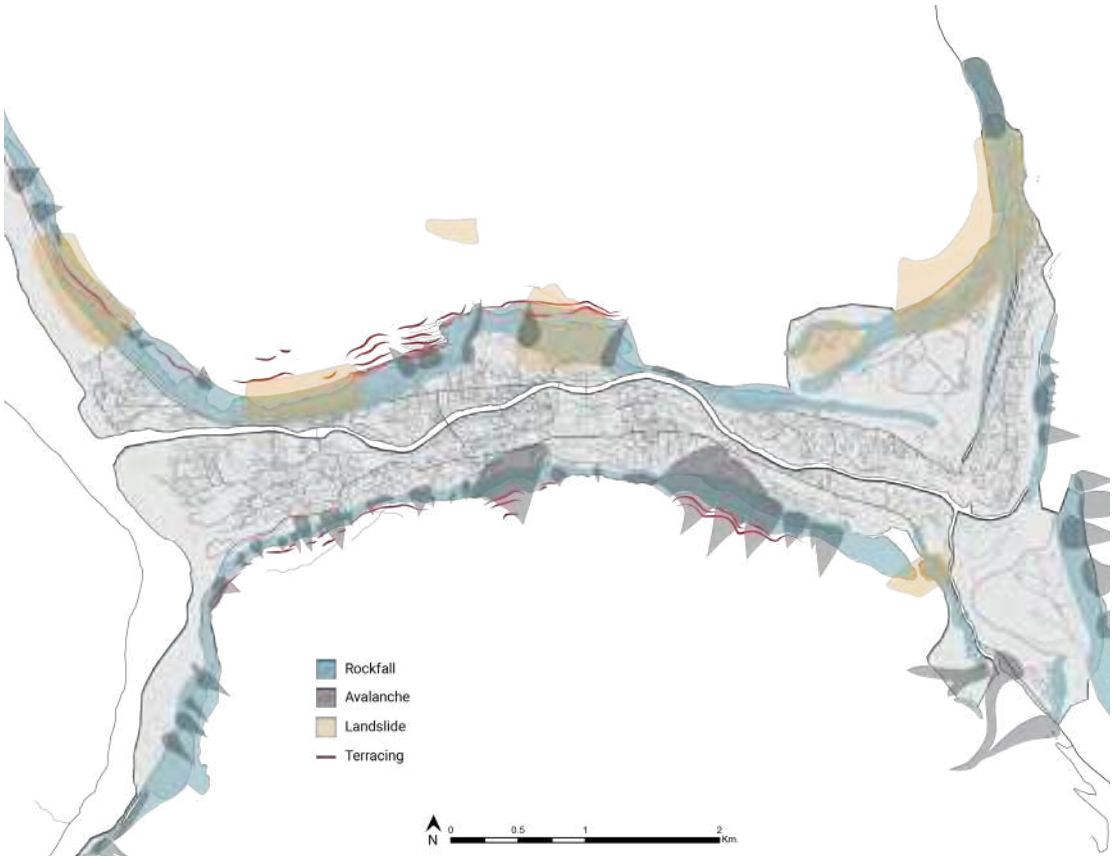


Fig 10. Showing area covered by Rockfall, Avalanches and Landslides and existing terracing in Khorog

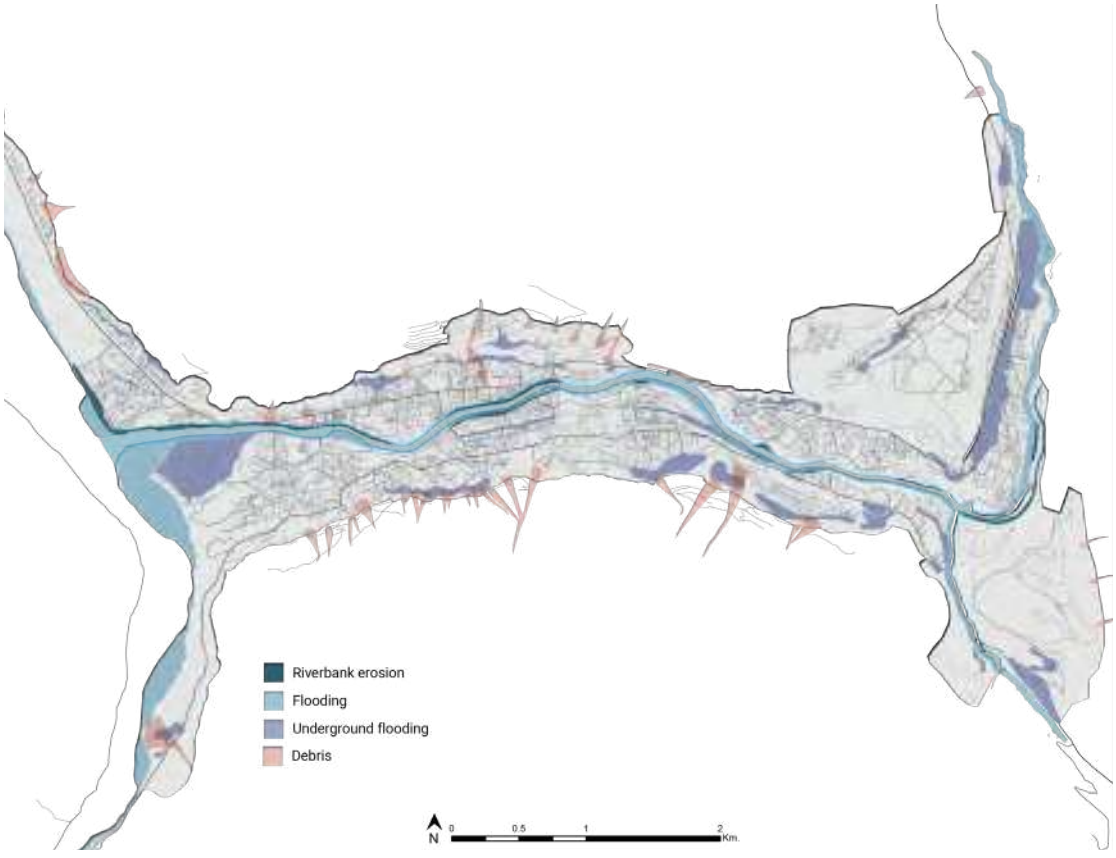


Fig 11. Showing area covered by Riverbed erosion, Flooding, Underground Flooding and Debris in Khorog

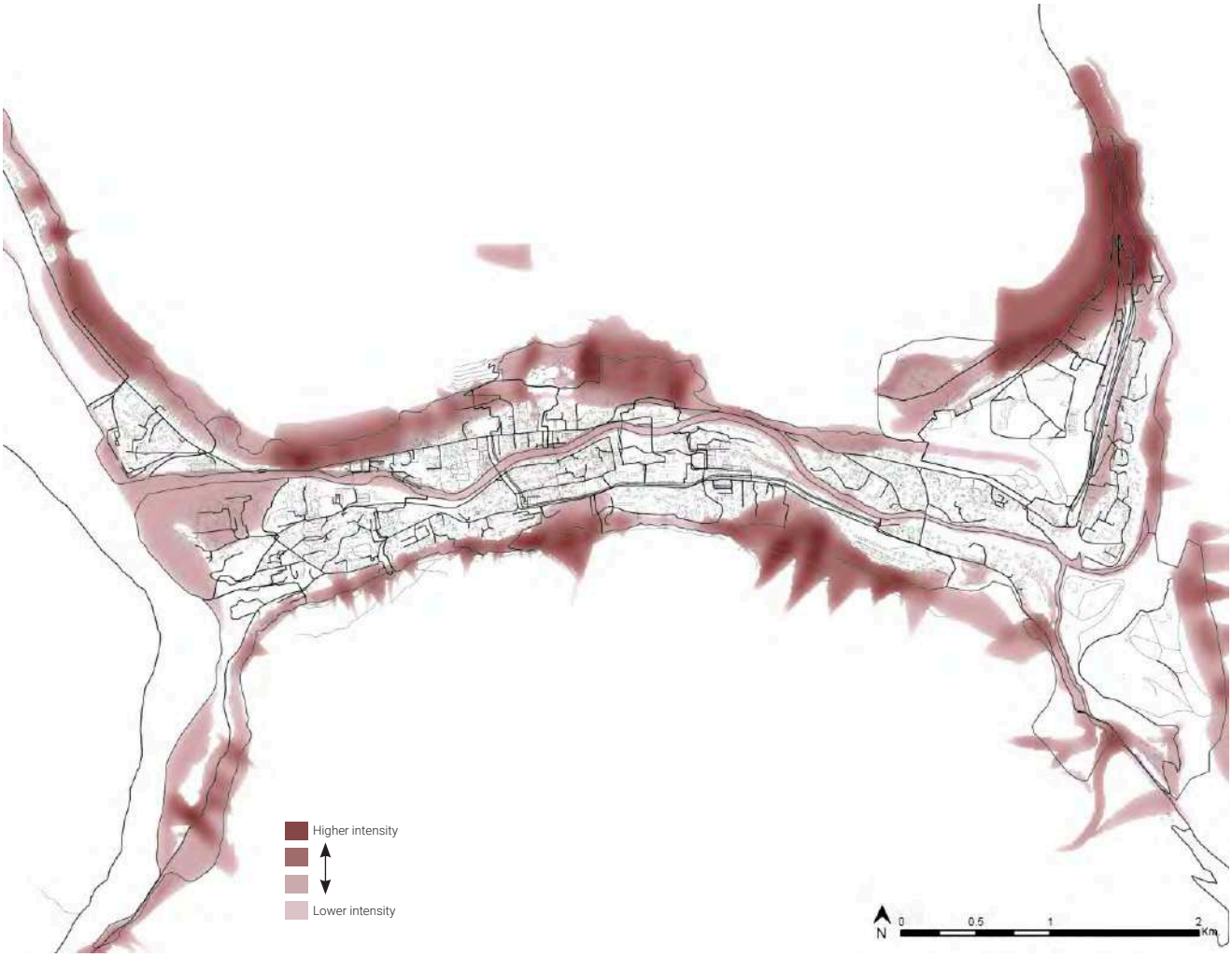


Fig 12. Map showing areas in Khorog experiencing any hazard, by a higher and lower intensity

Frequency and intensity of hazards

32.9% of the total population of Khorog is impacted by natural hazards and 48.7% of the area within the administrative boundary is at risk. A greater number of people and lands towards the margins of the city are impacted by hazards.

Additional environmental resilience challenges the city faces are data availability, existing capacity to gather and share data, and coordination between government and non-governmental organizations to efficiently mitigate and prepare for natural disasters and future climate change related impacts.

Figure 11 highlights that the current infrastructure and population distribution in the city is not optimized to respond to the hazards faced by the city as there is overlay in the areas impacted by hazards, and population and infrastructure. This helps to identify 'hot spots' where mitigation strategies could be prioritized.

Figure 11 also show some areas where there is no current development but where there is hazard risk. With the city's population increase, these areas are highlighted as those that should not be expanded into.

The maps in figures 12-15 indicate population and land areas that are affected by both high frequency low intensity and low frequency high intensity hazards, to be considered for resilience strategies.

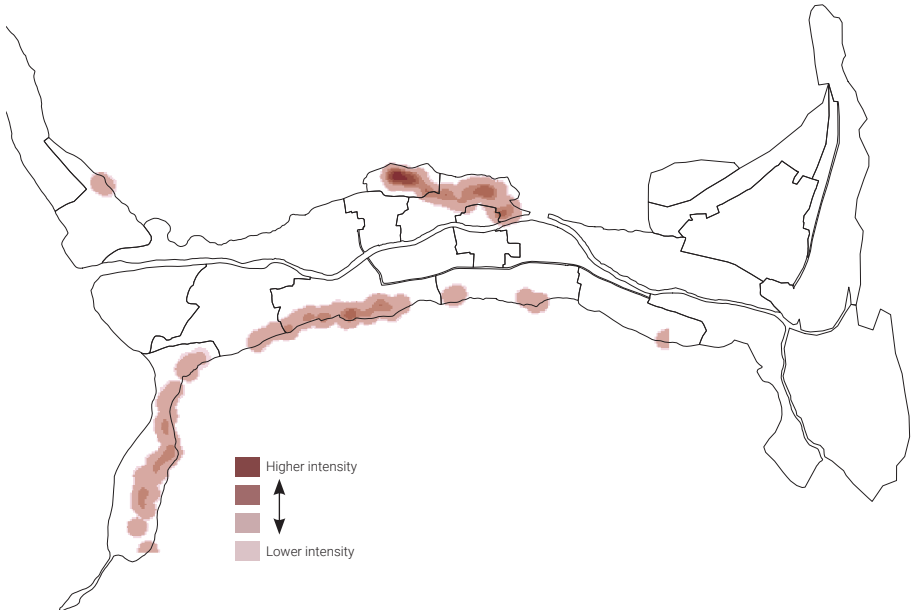


Fig 13. Map showing the population at risk of low frequency, high impact hazards

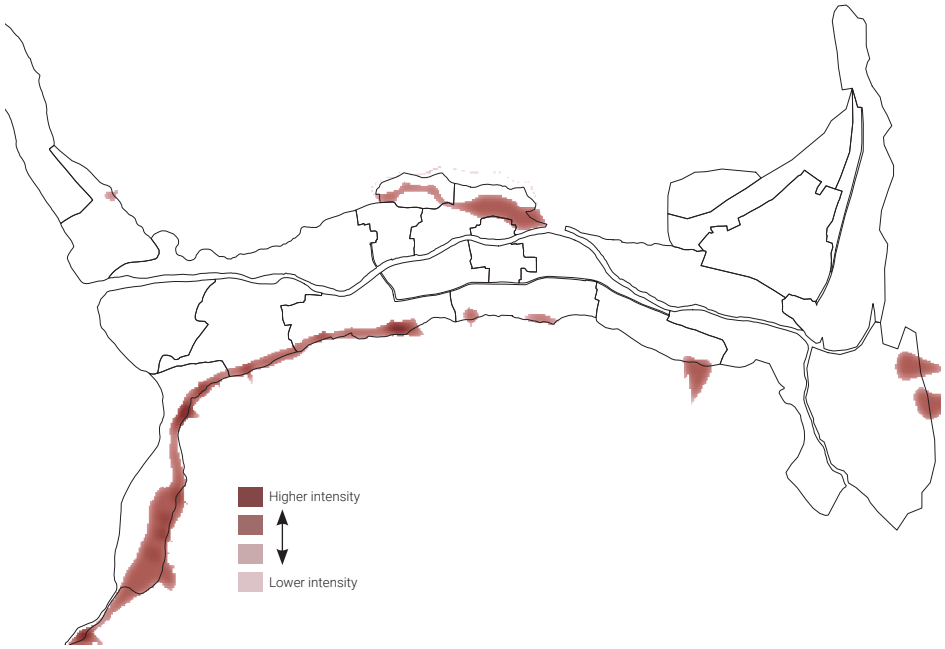


Fig 14. Map showing the land impacted by lower frequency hazards with a high intensity of impact

Figure 13 indicates areas of the city that are subject to low frequency but high intensity events. Hazards such as avalanches or landslides may occur rarely but infrastructure that is rebuilt in place of that which has been destroyed by a hazard, may still be susceptible to future risk.

Even though these are rare events, 1156 people (3.8% of the total population) are still impacted by them, and they cover a substantial area of land. Construction in these areas, therefore, is advised against. This is particularly relevant in Khufak, Markazi, Khichordev, and Nivodak.

Infrastructure built on lands affected by less frequent but high impact hazards, may be the result of land scarcity in the city in general, independent construction, lack of knowledge sharing or management, limited impact of existing zoning or environmental strategies, or a lack of longer-term data monitoring. The areas identified in Figure 12 and 13 should not be overlooked in resilience strategies but requires specific mitigation strategies to make the city more resilient.

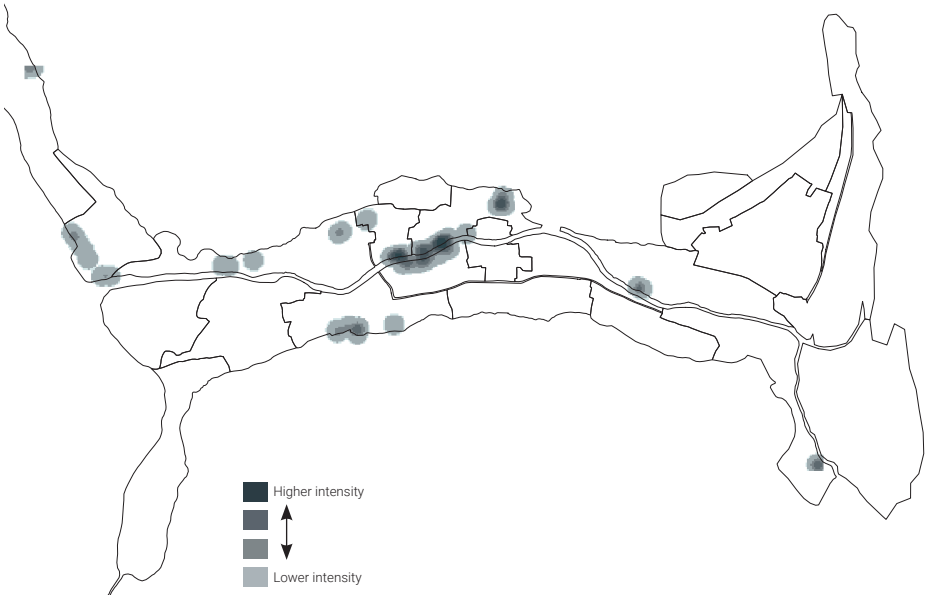


Fig 15. Map showing population density at risk of high frequency, low impact hazards

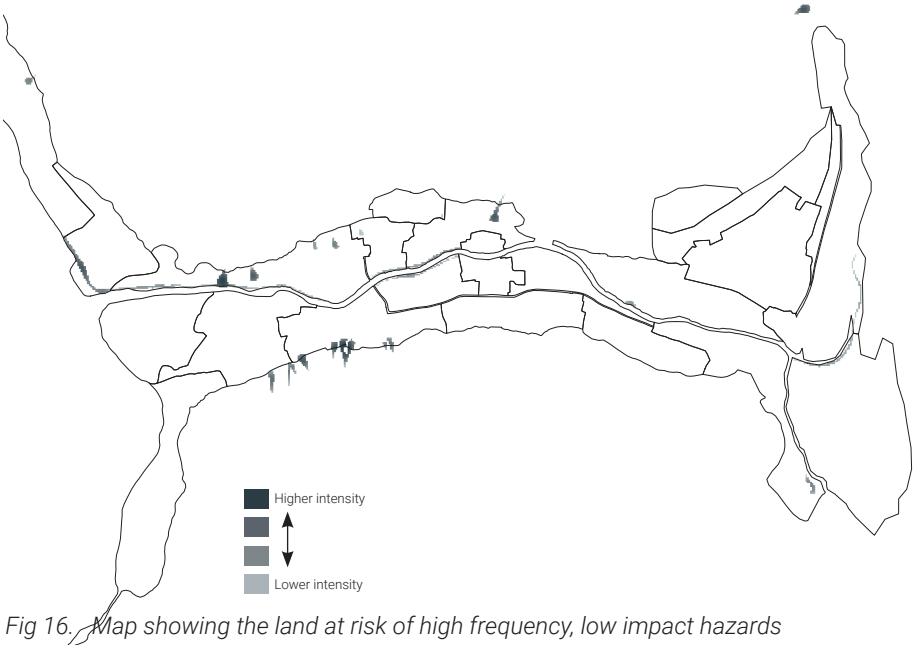


Fig 16. Map showing the land at risk of high frequency, low impact hazards

Land area and population that are impacted by hazards that occur frequently but have a low intensity impact are shown in Figure 14 and Figure 15. These hazards may be normalized due to the gradual impact on infrastructure and people in the city. In Khorog, these events are largely related to debris flow and riverbed erosion. These events put a total of 403 people at constant, relatively low risk, however, they do impact a number of key areas in the city.

Although Figure 15 demonstrates that only a small area of land is impacted by this type of hazard, a large number of people are at risk in the city center. This is due to the higher population density in this area. This means that this area should be considered either as an area where densification should be limited, or where mitigation measures should be put in place. In Khorog, buildings are constructed up to the river's edge, without formalized protection against riverbank erosion. This is therefore, considered a challenge for the city.

Considering the low frequency, high intensity hazards, and which areas of the city they impact (predominantly Kichordev, Khufak and the south western perimeter, Barakat, Nivodak) and the high frequency but low impact hazards (Nosiri Khisrav, Dashti Poyon and others), means that these areas are not overlooked for hazard mitigation, and that immediacy and the type of mitigation can be better tailored to more focused areas.

View West from the river edge, Khorog © UN-Habitat

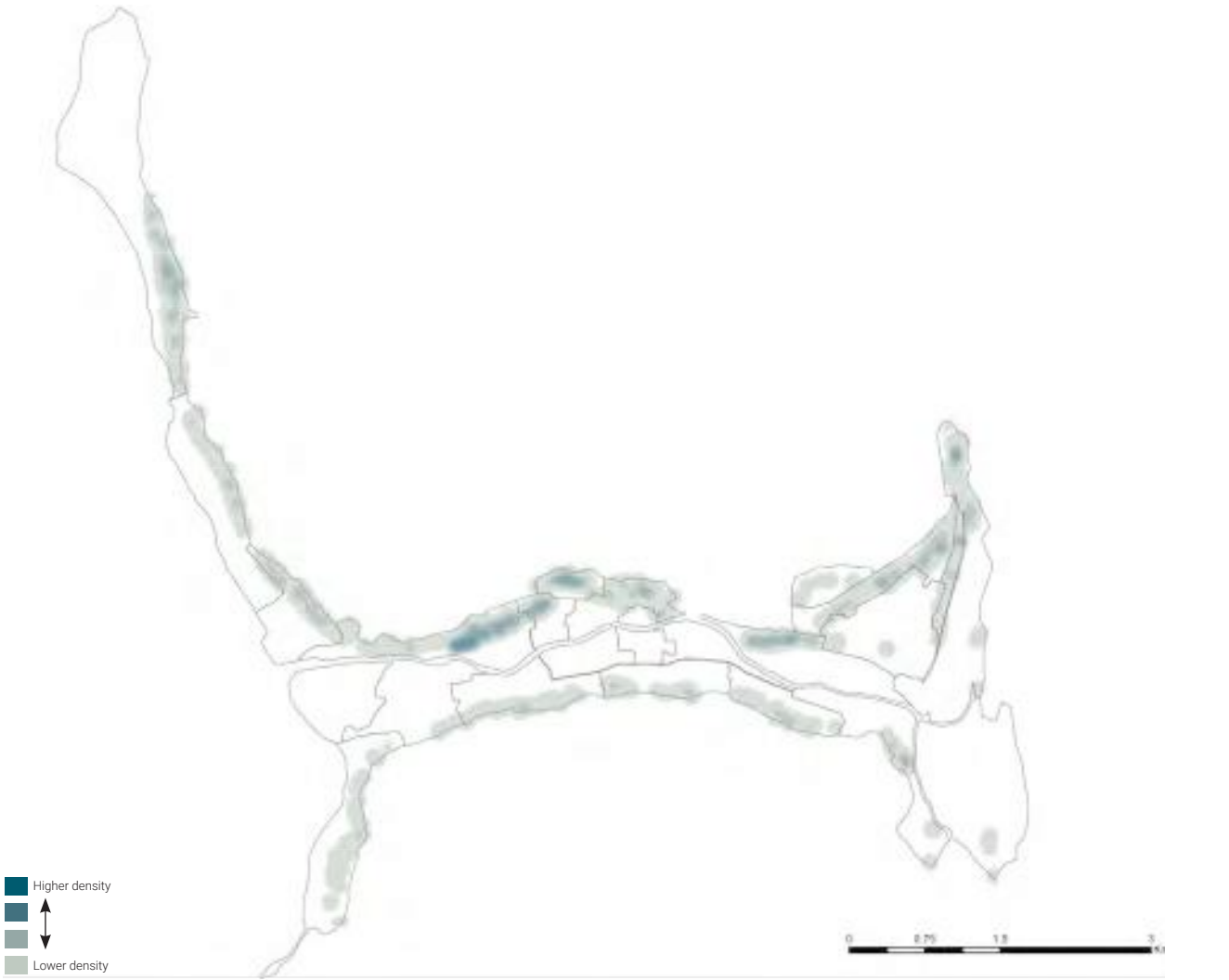


Fig 17. Highlighting the density of population at risk from rockfalls

Specific Hazard Assessment

This part of the assessment gives a more comprehensive profile of the specific types of hazard risk impacting the city. It shows not only the area of land at risk, but also the population density. This helps to show priority areas for mitigation, as well as areas in which new development should be prohibited.

Rockfalls

Rockfalls are common in Khorog, due to the gradient of slopes and loose rock and soil on both the North and South side of the city. Rockfalls impact a higher number of people and land in the North than in the South of the city. A total of 5,449 people are at risk from rockfalls, most of which (5,039 people) from frequent and high intensity occurrences. It also impacts 320.8 ha (23.2% of the administrative area).

The north-central area of the city, with the exception of the Military area, has a high concentration of population and land affected, particularly in Saifullo Abdulo. This Mahalla may be considered a priority area in which to limit growth and to implement a mitigation strategy specific to rockfalls, such as terracing and forestation.

Areas such as Nivodak have a lower concentration of population at risk but a larger area of land impacted. Therefore, it is important that when the city grows, construction in this area is limited, unless major mitigation measures are put in place.

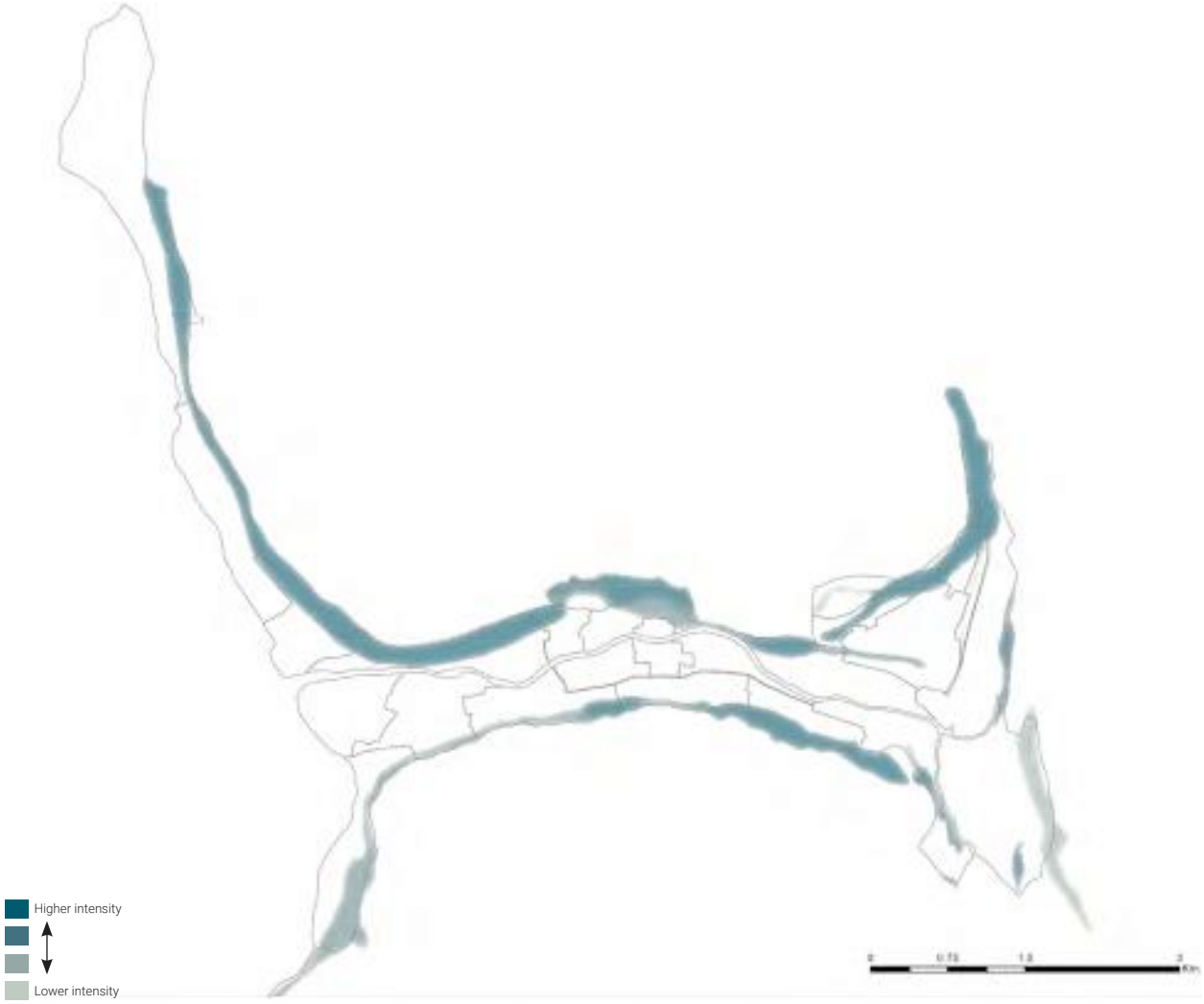
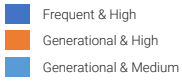


Fig 18. Highlighting the land at risk and intensity of rockfalls



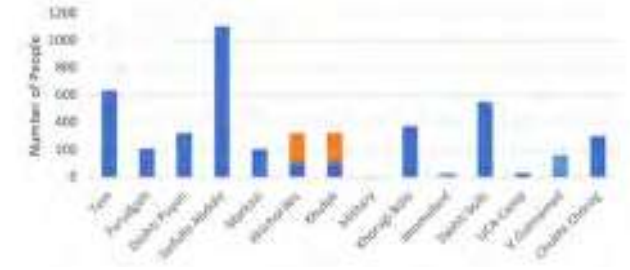


Fig 19. People impacted by, and the intensity of rockfalls in each Mahalla in the North

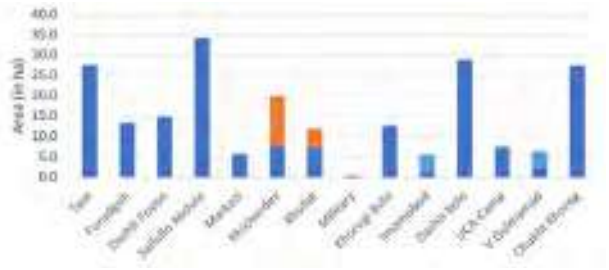


Fig 20. Area (ha) impacted by, and the intensity of rockfalls in each Mahalla in the North

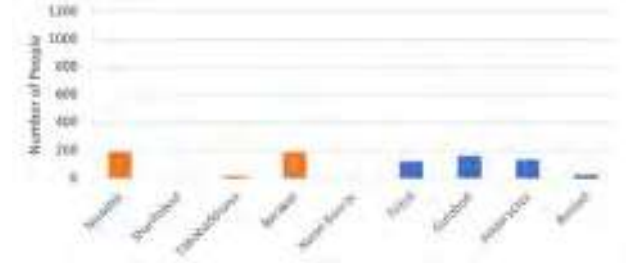


Fig 21. People impacted by, and the intensity of rockfalls in each Mahalla in the South

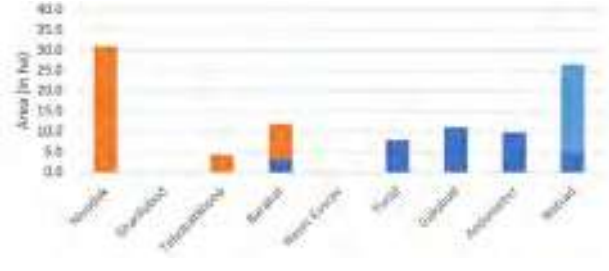


Fig 22. Area (ha) impacted by, and the intensity of rockfalls in each Mahalla in the South

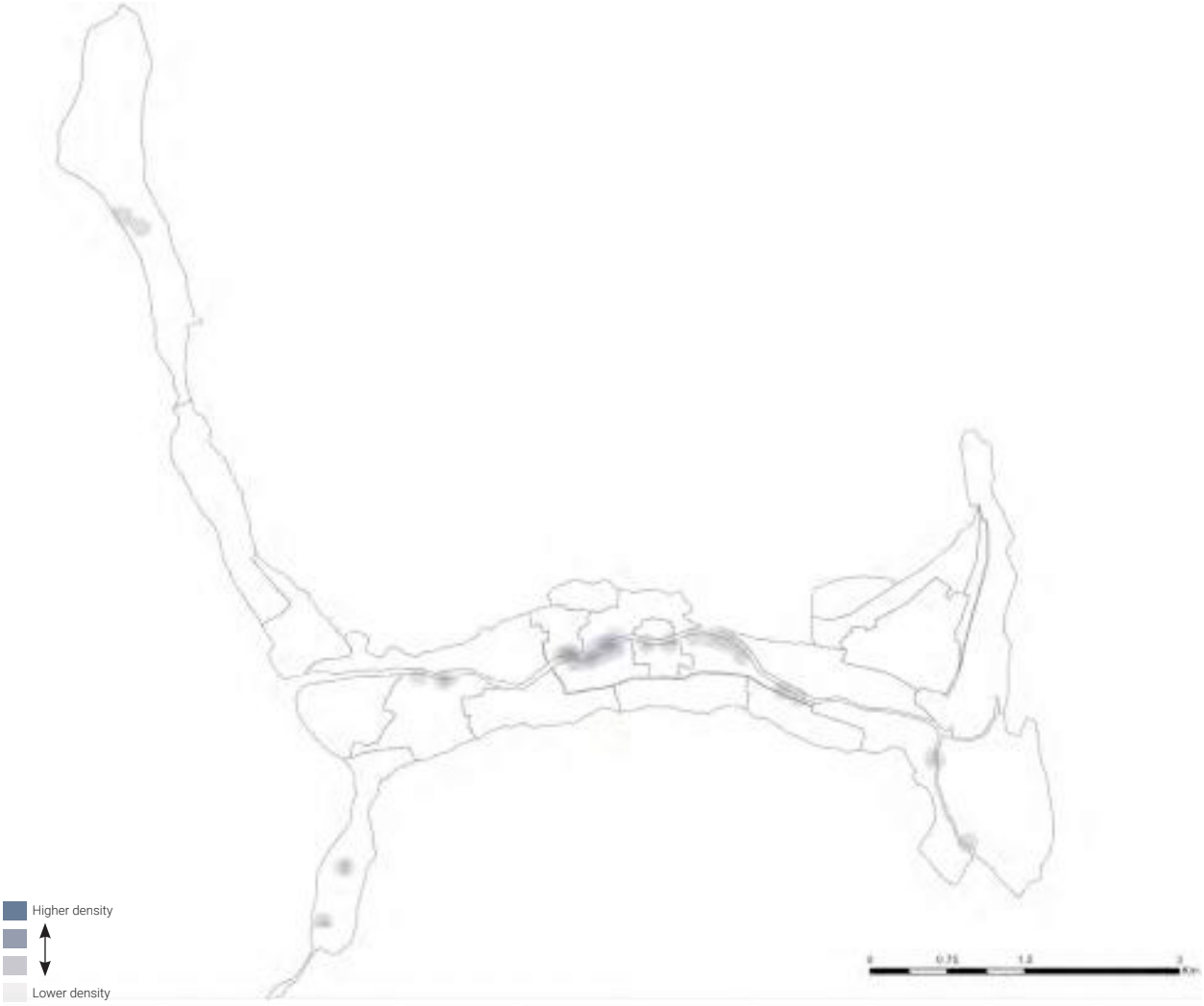


Fig 23. Highlighting the population density at risk of flooding

Overground Flooding

Flooding in Khorog is categorized as overground and underground flooding. This assessment considers both separately due to the specificity of mitigation required for each type of hazard and the challenge it poses to the city.

Overground flooding is caused by water overflowing from the city's main water sources, the Pyanj river. The causes of overground flooding are numerous and include variations in water levels, and the absence or poor quality of the riverbank. Changes in the water levels in Khorog are experienced during the winter and summer months and can be unpredictable due to water use by villages upstream, and by climate change impacts on glacial lakes melting.

A total of 313 people and 208 ha of land is affected by floods. Key seasonal flooding areas are in Mahallai Sharifobod, Nivodak and Tem, where a large area of land is impacted, and Mahallai Khichordev, Markazi, Nosiri Khisrav, Tirchid and Nivodak, where more people are impacted.

The impact of overground flooding in Khorog presents a danger to the city due to proximity of infrastructure adjacent to the river and the lack of protection that can be provided by a strong riverbank or by permeable surfaces and vegetation.

Tem represents 40.5% of the total flood area of the city. Although there is a relatively low number of people impacted in this area, due primarily to the low population density, this is a critical area as it has potential for densification as it absorbs expected expansion from the city center. This could prove problematic if the city expands into this area without appropriate flood mitigation meausres.

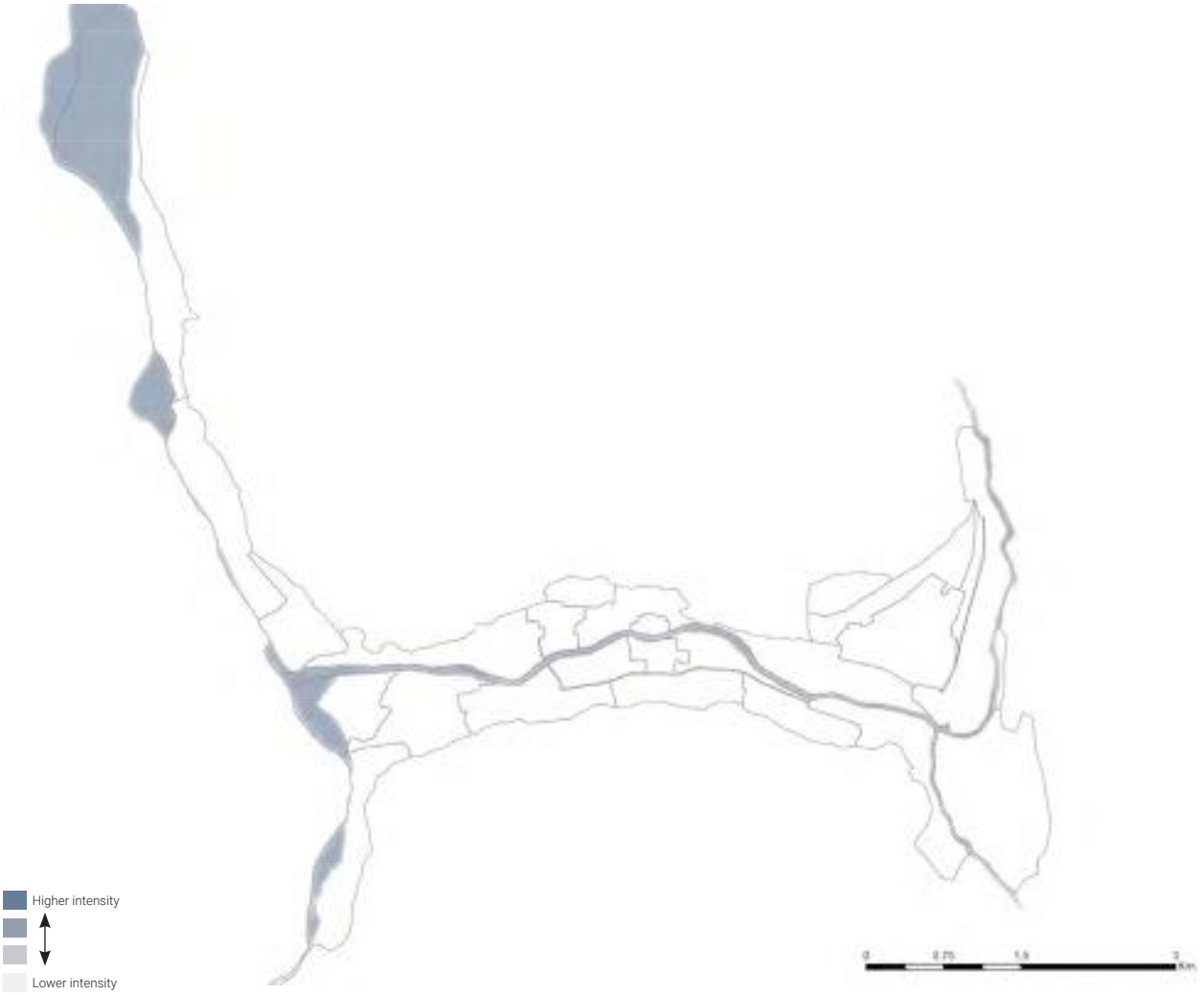


Fig 24. Highlighting the land at risk and intensity of flooding

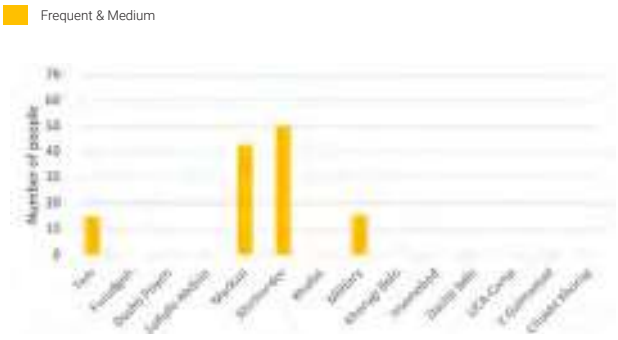


Fig 25. People impacted by, and the intensity of flooding in each Mahalla in the North of the city

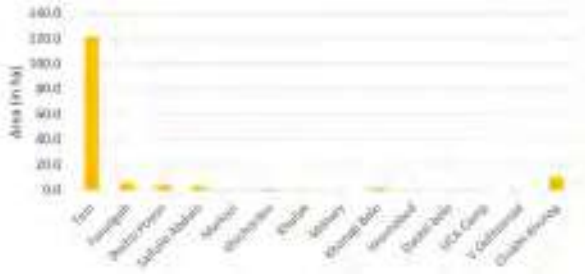


Fig 26. Area (ha) impacted by, and the intensity of flooding in each Mahalla in the North

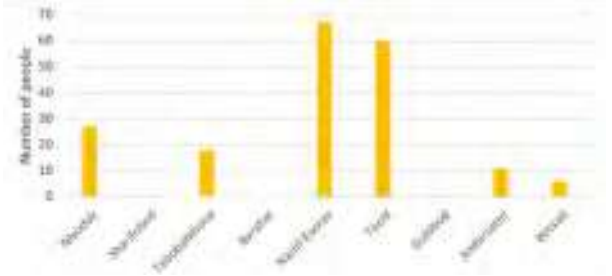


Fig 27. People impacted by, and the intensity of flooding in each Mahalla in the South

Fig 28. Area (ha) impacted by, and the intensity of flooding in each Mahalla in the South

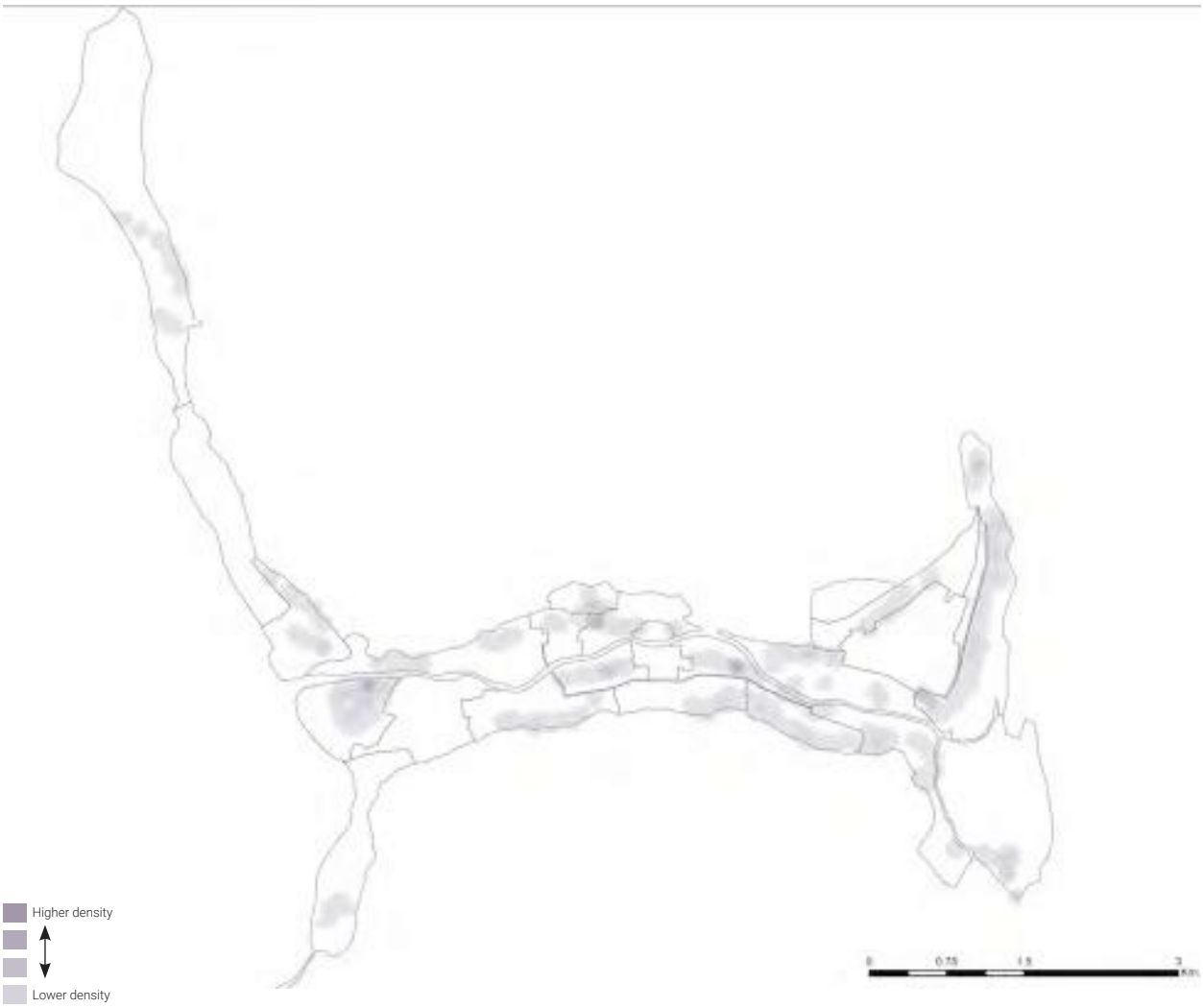


Fig 32. Highlighting the density of population at risk from groundwater flooding

Groundwater Flooding

Groundwater flooding, or water logging, is a challenge for the city due to the nautral water sources in the city. This includes the main river running through the city, water run off from the mountains, and by the number of water channels through the city.

Soil type and the removal of vegetation without replanting can exacerbate groundwater flooding. In the case of Khorog, water network infrastructure for drinking and irrigation also is a cause of ground water flooding. Poor or outdated infrastructure means that water is filtered out of these channels and pipes.

Groundwater flooding is an issue for the city that impacts building foundations and agriculture. The total population affected by groundwater flooding is 4,345 people. A total of 3,918 people are impacted by frequent and high intensity underground flooding, 800 of which are located in Chukht Khorog alone. This indicates that existing development in this area did not account for this hazard at the time of design and construction and this area would benefit from a retrofitted mitigation strategy, or improvement to the existing water channel infrastructure and draining channels.

210 ha in Khorog are impacted by groundwater flooding. Tem contains the largest impacted area, however, due to low population density, fewer people are at risk. As a result, there is lower necessity to mitigate flooding in the region, however, this must be addressed if development is increased in this area in the future.

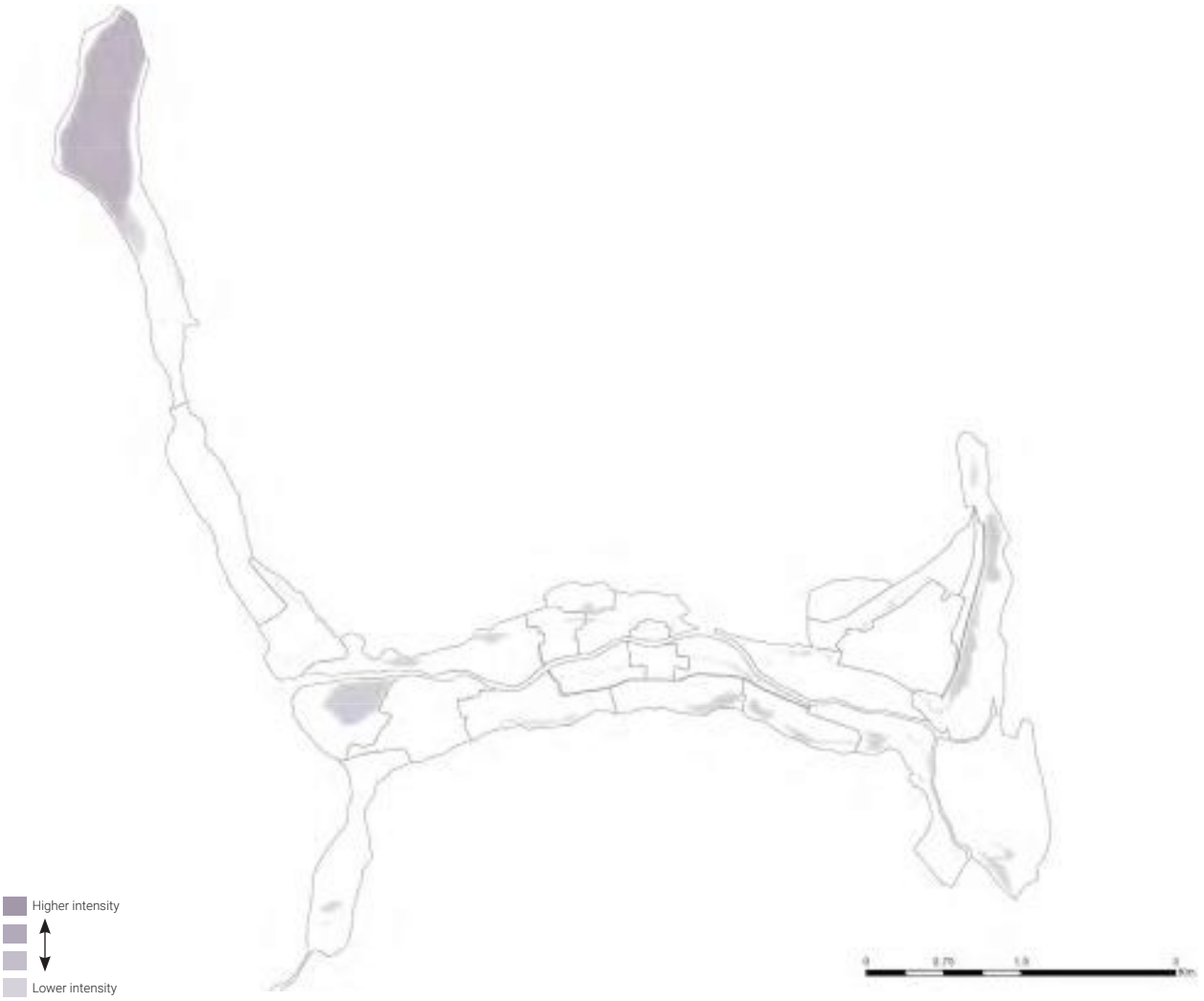


Fig 37. Highlighting the land at risk and intensity of groundwater flooding

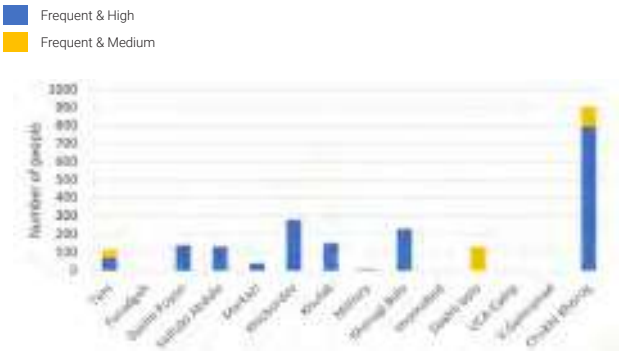


Fig 33. People impacted by, and the intensity of groundwater flooding in each Mahalla in the North of the City

Fig 34. Area impacted by, and the intensity of groundwater flooding in each Mahalla in the North of the city

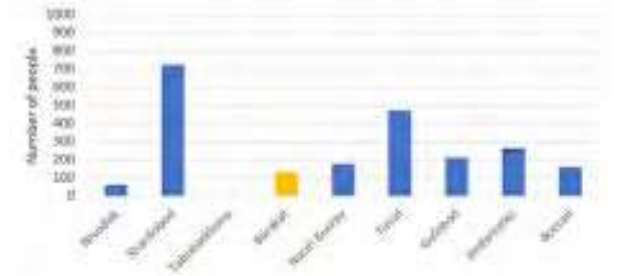


Fig 35. People impacted by, and the intensity of groundwater flooding in each Mahalla in the South of the city

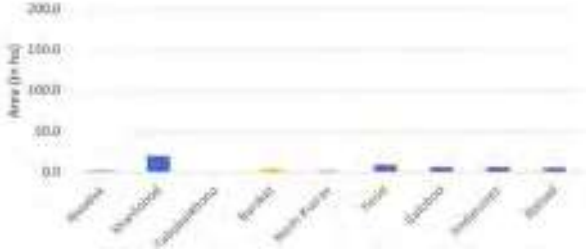


Fig 36. Area impacted by, and the intensity of groundwater flooding in each Mahalla in the South of the city

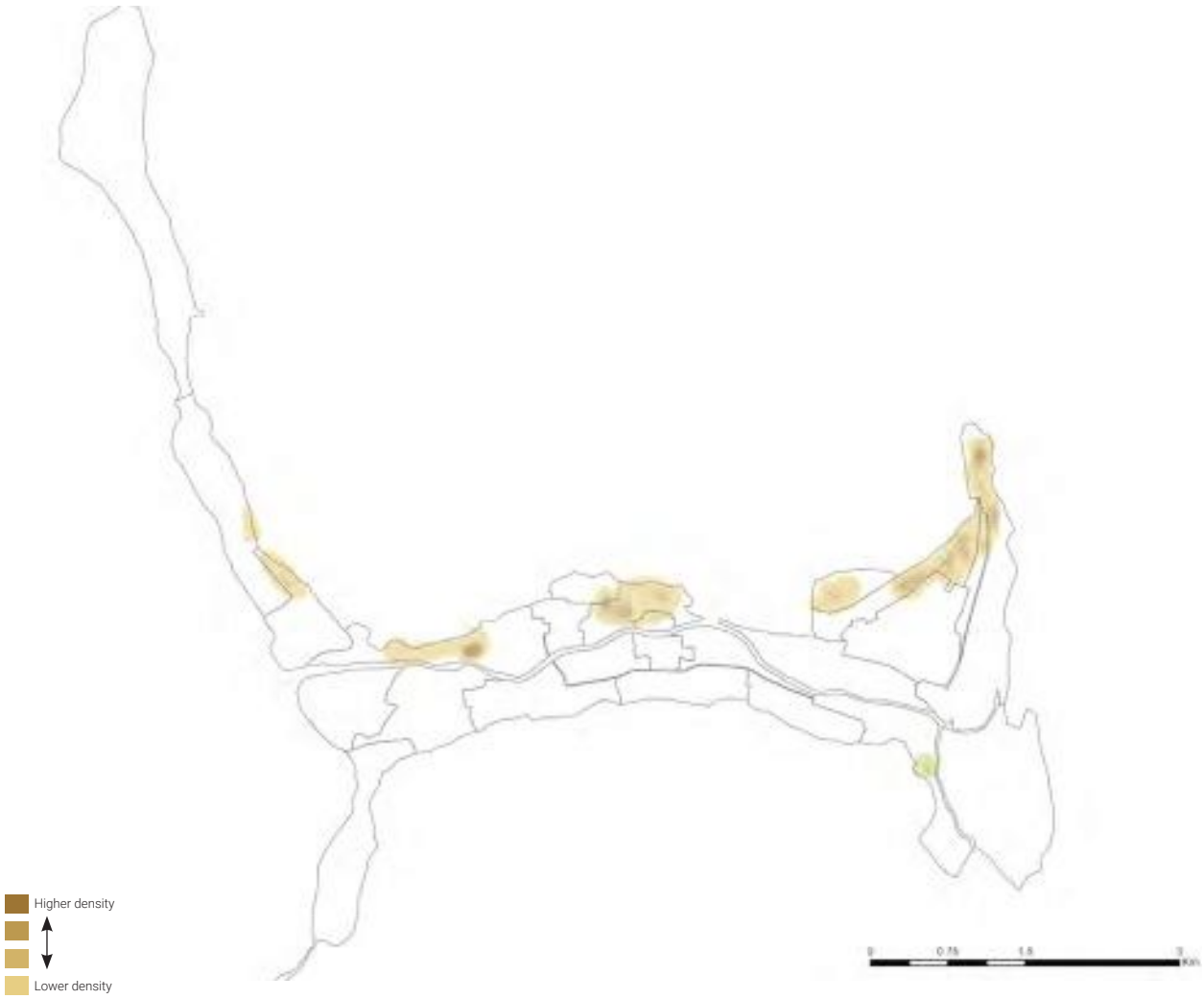


Fig 38. Highlighting the density of population at risk from landslides

Landslides

The causes of landslides and mudflows are similar to those of rockfall and are influenced by factors such as soil and rock type, the steep gradient of slopes surrounding the city, and changes in temperature and weather. The impacts of climate change may, therefore, mean that landslides become more unpredictable. Landslides are focused in three main areas in Khorog, all in the North. Approximately 2,243 people are directly affected by landslides and an area of 129.2 ha (9.4 % of administrative area) is impacted.

Although the occurrence of landslides is rare and of low intensity, they impact 1,562 people, or 69.6% of the total population, however, it appears that current population density and infrastructure does not avoid these areas at risk of landslides. The landslides that pose the most immediate threat to the city (frequent and of high intensity) impacts 485 people, predominantly in Saifullo Abdulo.

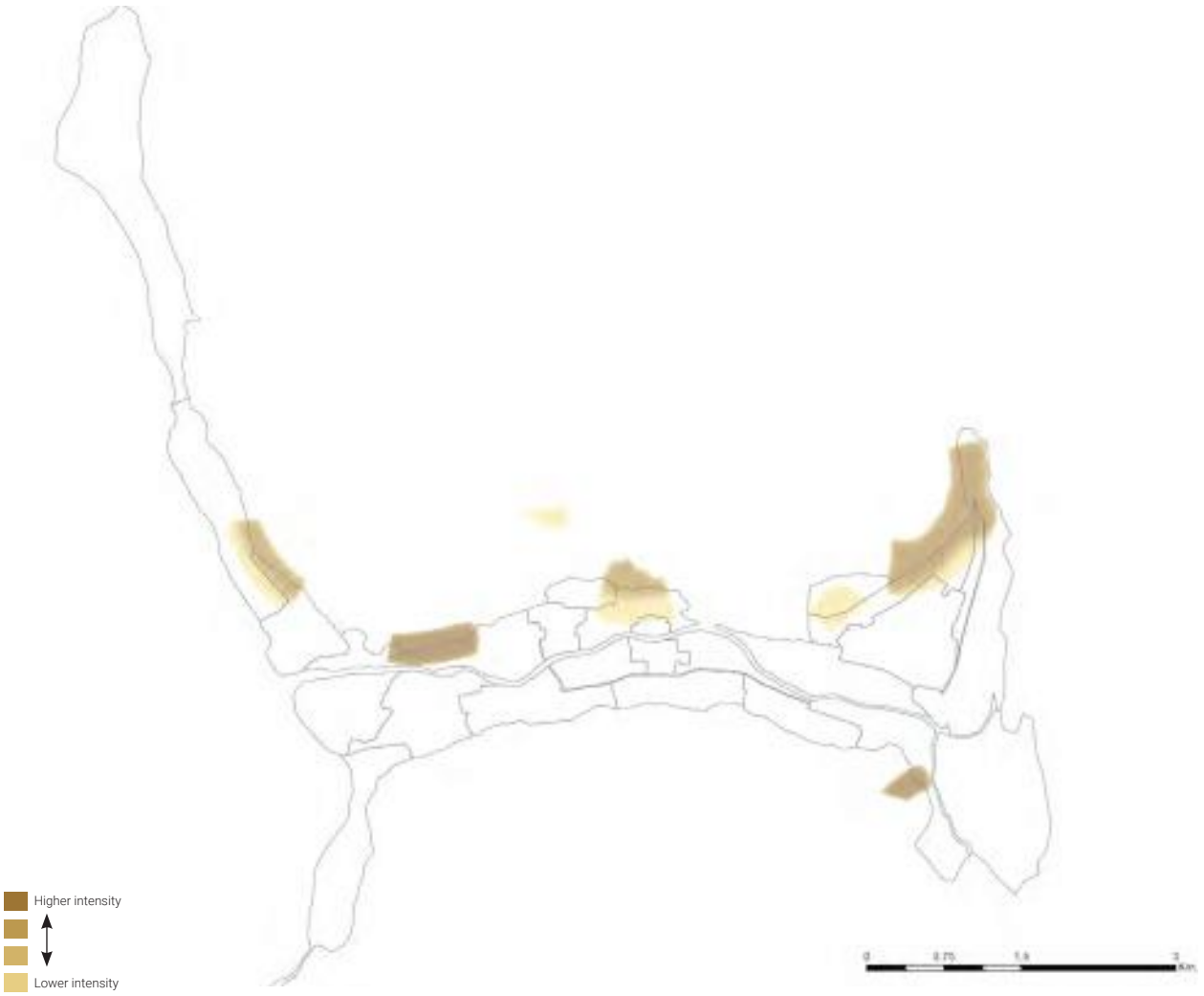
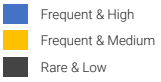


Fig 39. Highlighting the land at risk and frequency of landslides



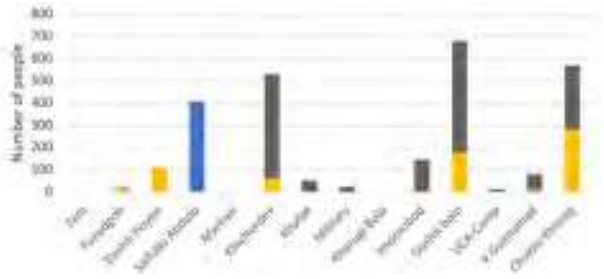


Fig 42. People impacted by, and the intensity of landslides in each Mahalla in the South

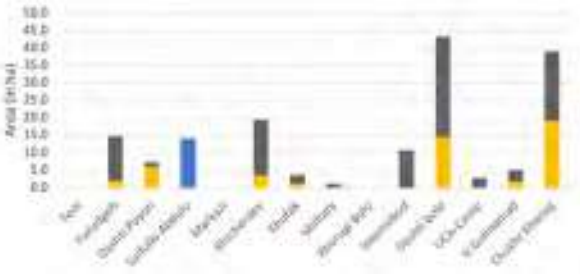


Fig 40. People impacted by, and the intensity of landslides in each Mahalla in the North

Fig 43. Area impacted by, and the intensity of landslides in each Mahalla in the North

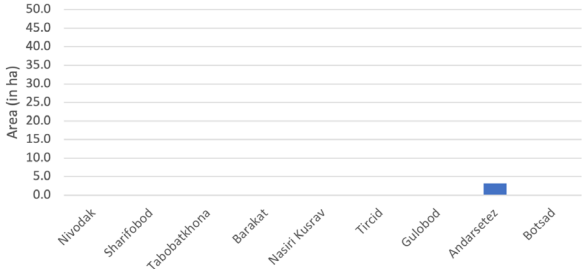


Fig 41. Area impacted by, and the intensity of landslides in each Mahalla in the South

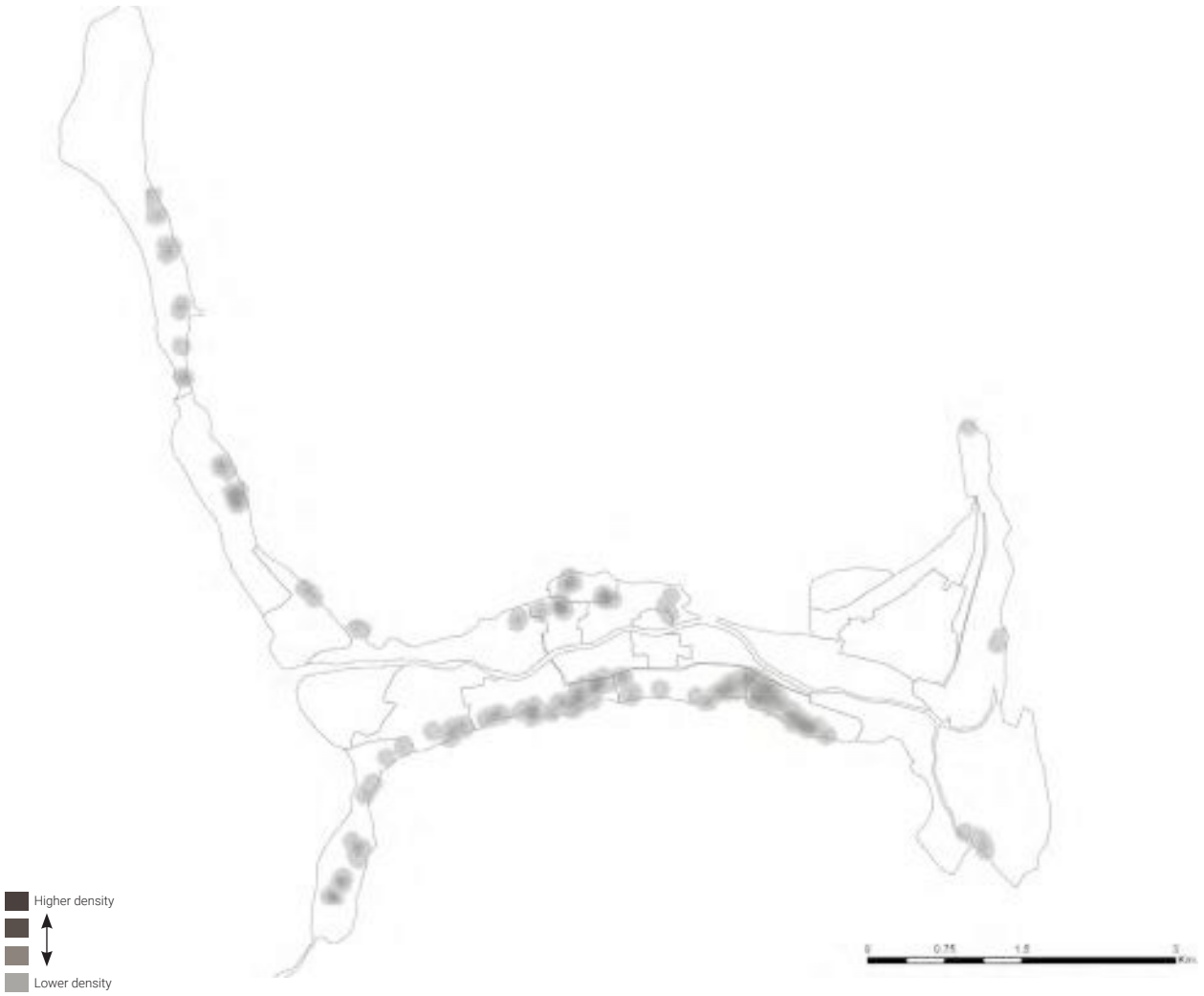


Fig 44. Highlighting the density of population at risk from avalanches

Avalanches

Avalanches occur seasonally in Khorog, predominantly in February and March, due to slowly warming weather that melts the heavy snow fall accrued over the winter months, and the steep gradient of hills surrounding the city. Avalanches in Khorog mostly impact the southern side of Gunt river, where the urban footprint meets the sloping edge of the mountains.

A total of 2,243 people are directly affected by avalanches in Khorog and an area of 129 ha within the administrative boundary of the city. The highest number of affected population are located in Gulobod and Barakat. Avalanches impact over 10 hectares of land in Nivodak, Barakat, Gulobod and Botsad. Although Gulobod and Barakat contain the highest concentrations of population impacted by these events, events in these Mahalla are rare and predominantly of a medium intensity. For this reason, although they must be acknowledged, they are not considered an imminent threat to the city.

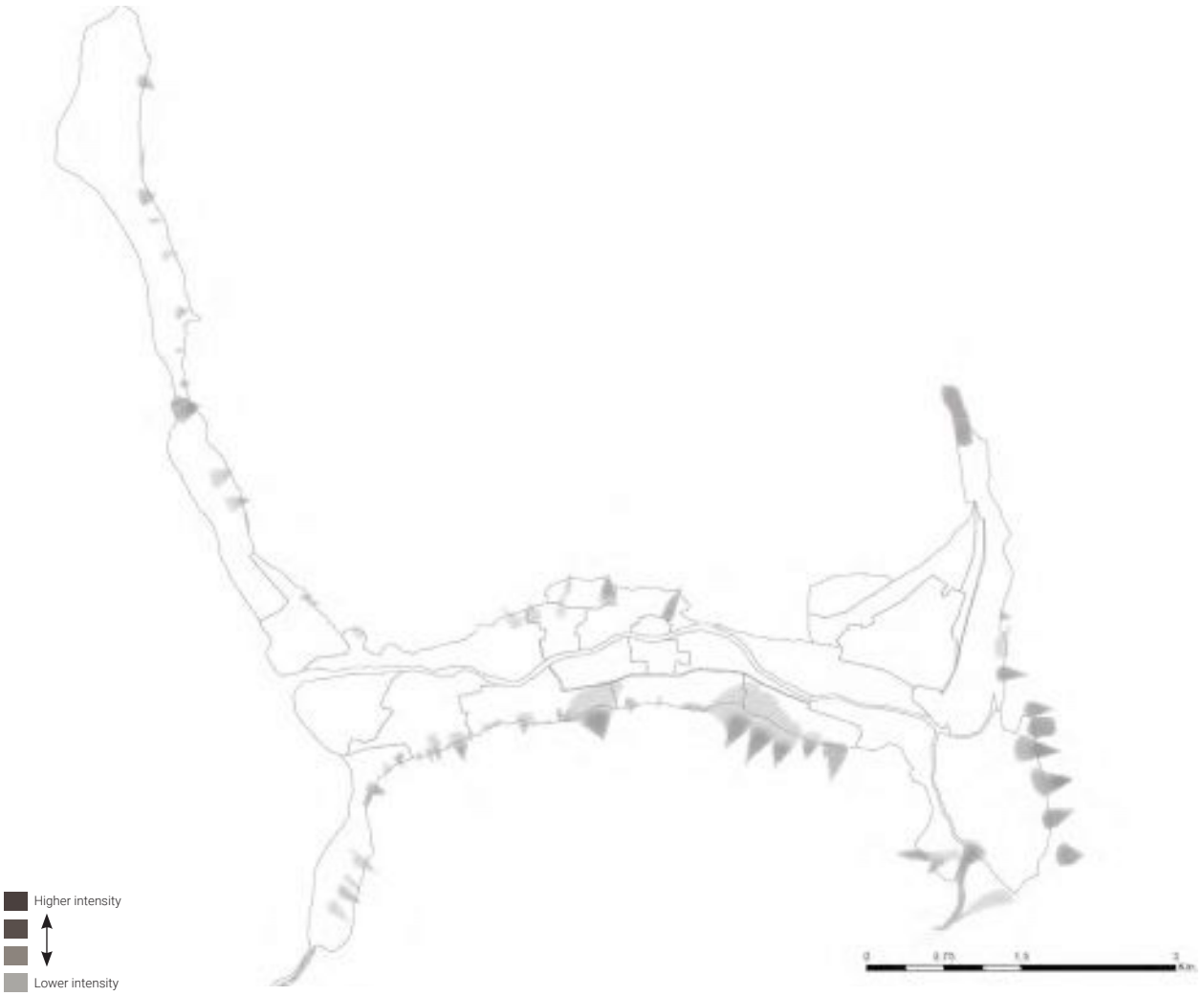


Fig 45. Highlighting the land at risk and frequency of avalanches

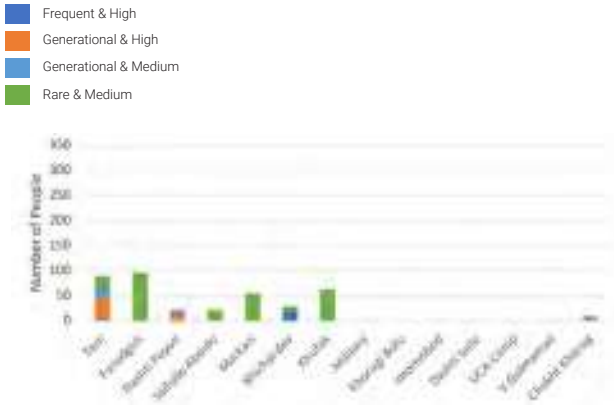


Fig 46. People impacted by, and the intensity of avalanches in each Mahalla in the North

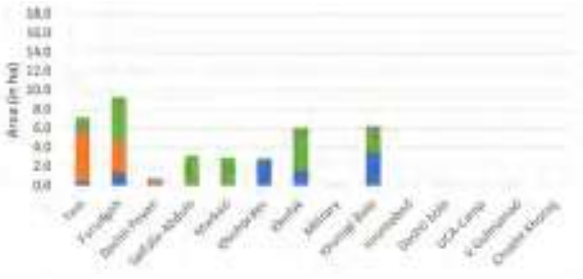


Fig 47. Area impacted by, and the intensity of avalanches in each Mahalla in the North

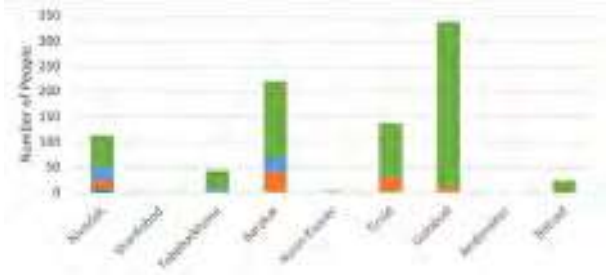


Fig 48. People impacted by, and the intensity of avalanches in each Mahalla in the South

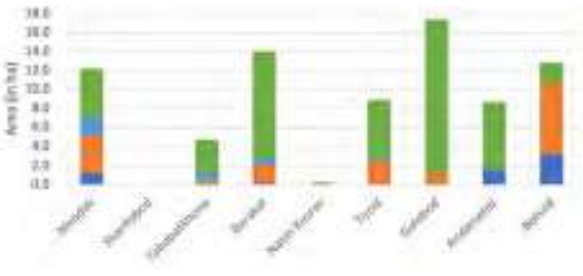


Fig 49. Area impacted by, and the intensity of avalanches in each Mahalla in the South

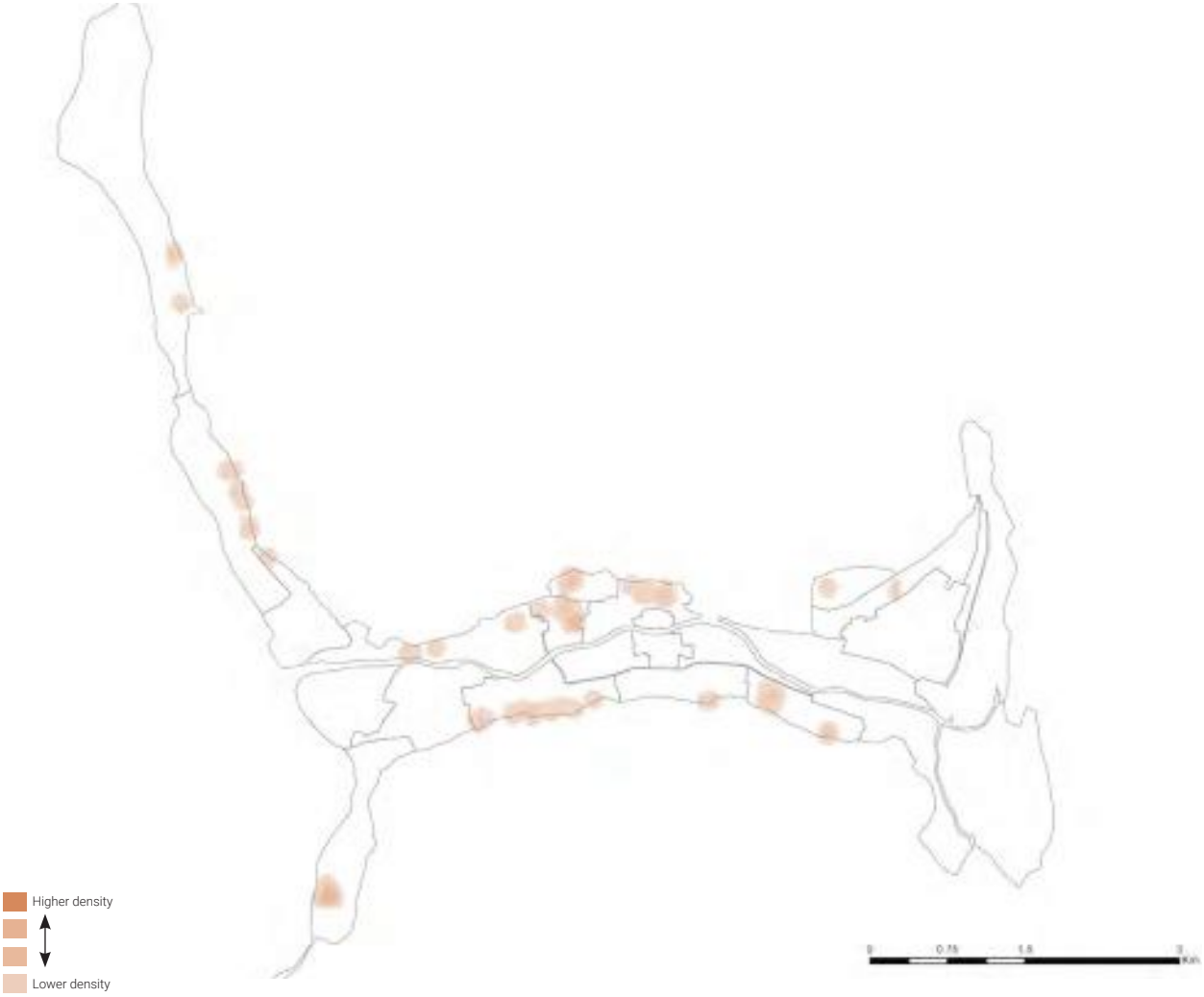


Fig 50. Highlighting the density of population at risk from debris flow

Debris Flow

Debris flow is the movement of loose mud, sand, soil, rock and water travelling down slopes. They occur during periods of intense rainfall or rapid snowmelt, and usually begin high on hillsides and mountains. They are often a destructive form of streamflow in steep channels and carry unusual amounts of sediment in the form of rocks, soil and trees.

629 people and 29.4 ha of land are directly affected by debris flow. The occurrence of this event is dispersed, with the highest population numbers and land areas affected in Nivodak, Barakat, Gulobod. Therefore, these three areas should be considered as a priority for the implementation of mitigation strategies. Markazi also comprises a high concentration of affected population but a less significant amount of impacted land. As a result, hazard mitigation efforts could be more concentrated here. However, relative to other hazards, debris poses a lesser threat to the city as the most frequent occurences are of low to medium intensity.

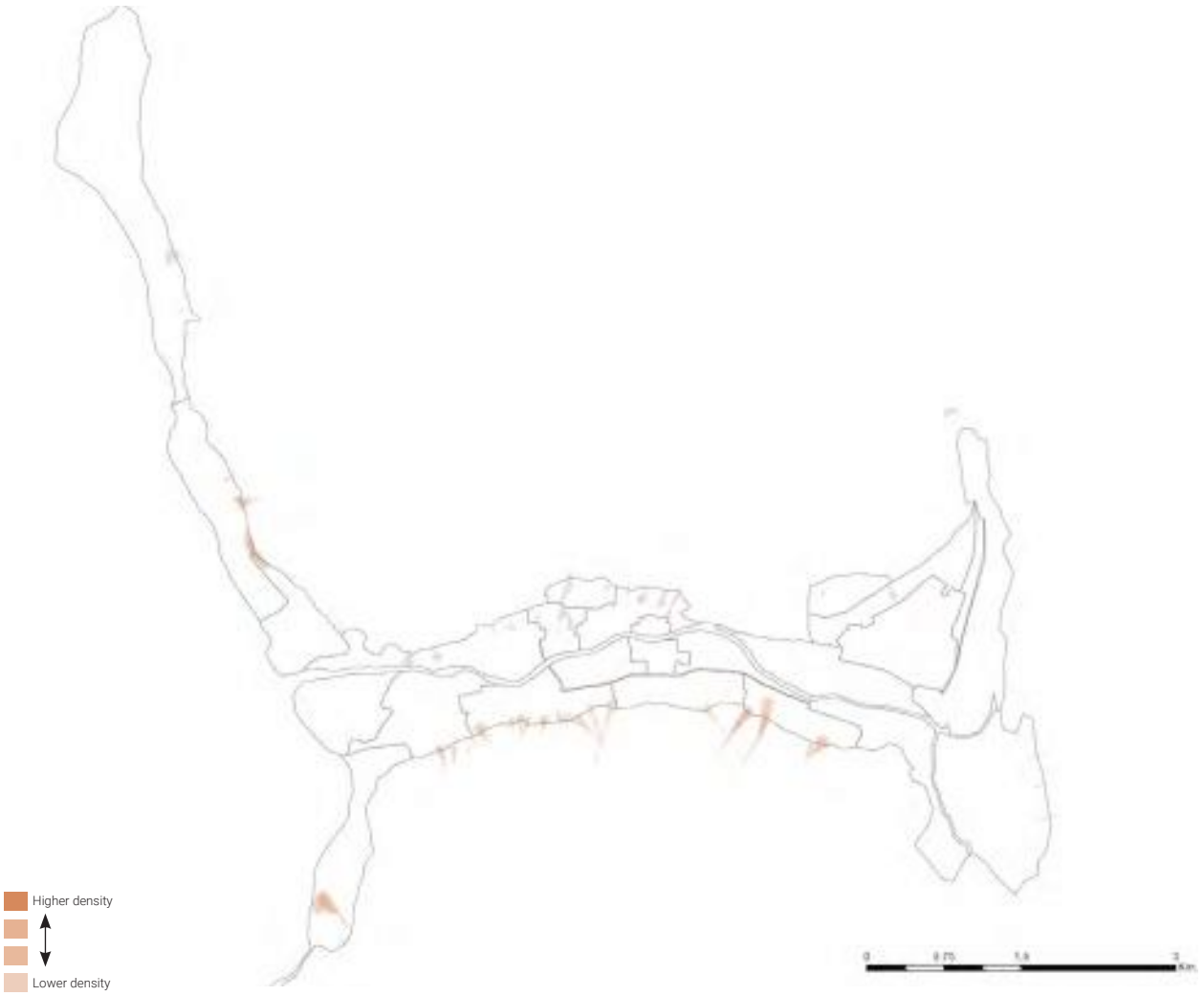


Fig 51. Highlighting the land at risk and frequency of debris flow

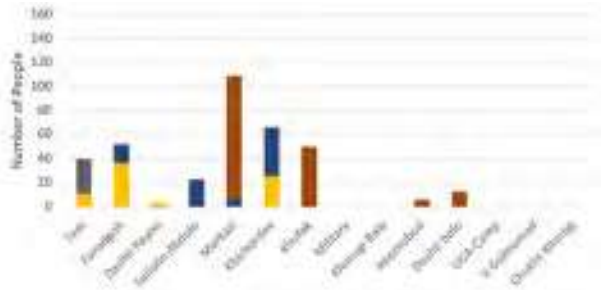


Fig 52. People impacted by, and the intensity of debris flow in each Mahalla in the North

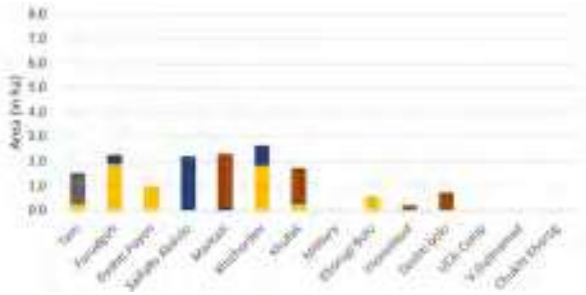


Fig 53. Area impacted by, and the intensity of debris flow in each Mahalla in the North

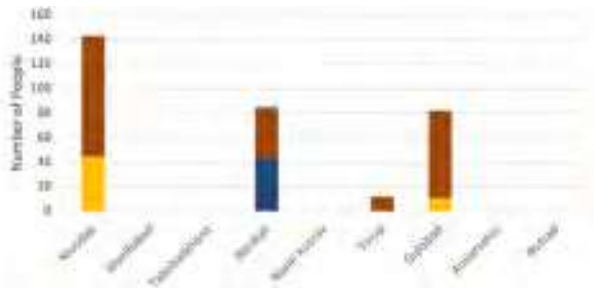


Fig 54. People impacted by, and the intensity of debris flow in each Mahalla in the South

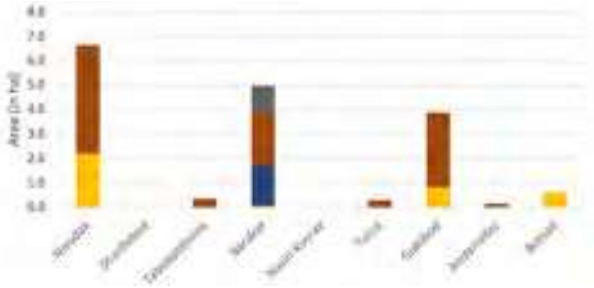


Fig 55. Area impacted by, and the intensity of debris flow in each Mahalla in the South

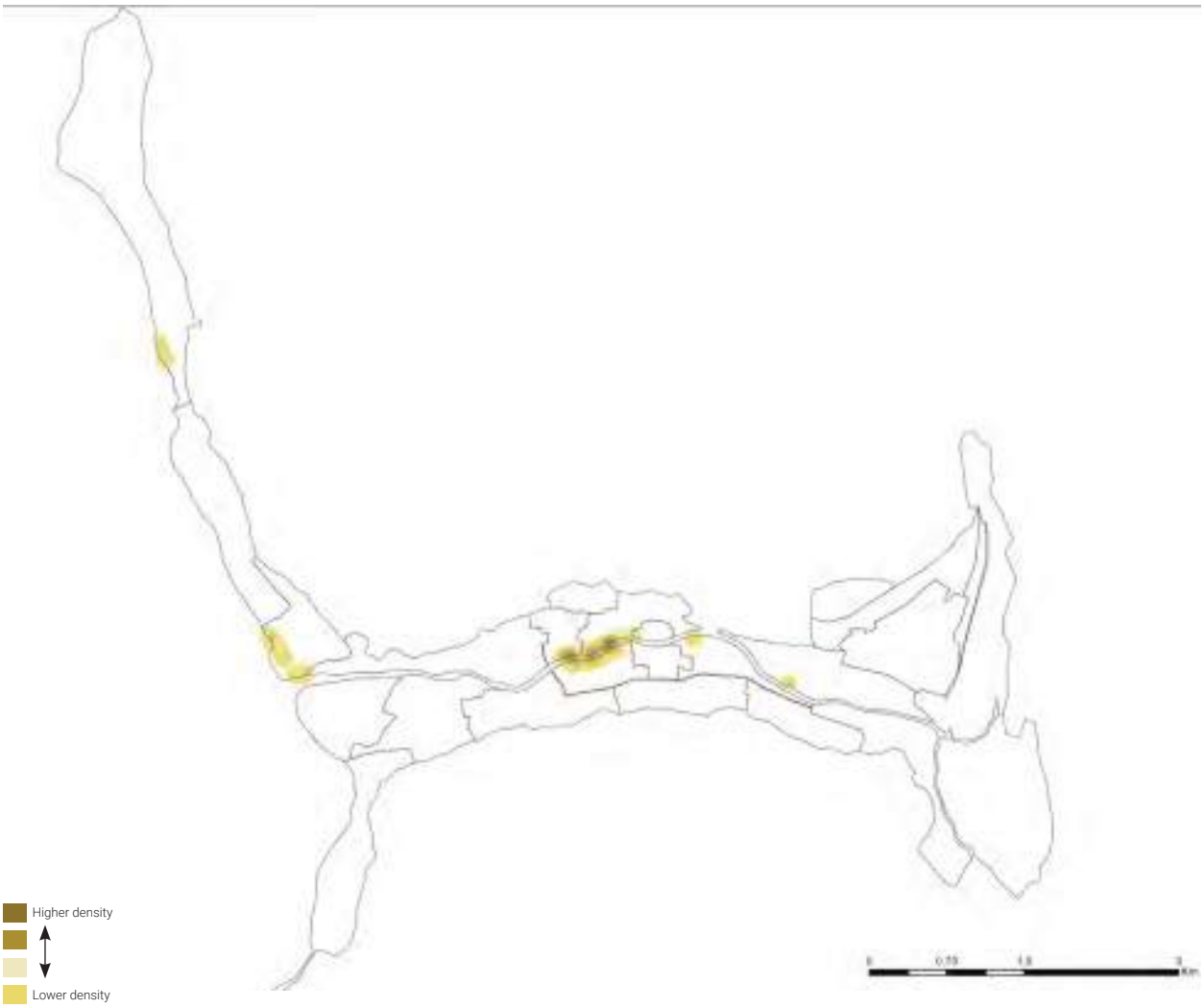


Fig 56. Highlighting the density of population at risk from riverbed erosion

Riverbed Erosion

Riverbed erosion takes place in areas that are subject to land regression or retreat due to a combination of geologic, seismic, hydrologic, or engineered factors. In Khorog, 91.4% of the population are affected by rare incidents of riverbed erosion with moderate impact, while 8.6% of the population are affected by frequent events caused by riverbed erosion. 280 people (0.9% of the total population) are regularly affected by riverbed erosion.

This hazard affects an area of 16.1 ha (1.2% of the administrative area). The central area of the city comprises the highest concentration of the affected population but the Mahallas located in the north-eastern edge of the city comprise the largest affected land extension. Growth in this area of the city should be limited at sites proximate to the river Gunt unless targeted mitigation efforts are enacted. This is of even greater importance in Tem and Furudgoh which comprise a large area of land impacted by frequent, high intensity erosion. Further areas to consider for mitigation include Nosiri Khisrav and Khichordev, as, although these areas experience only low frequency, low impact erosion, they contain a high number of people at risk.

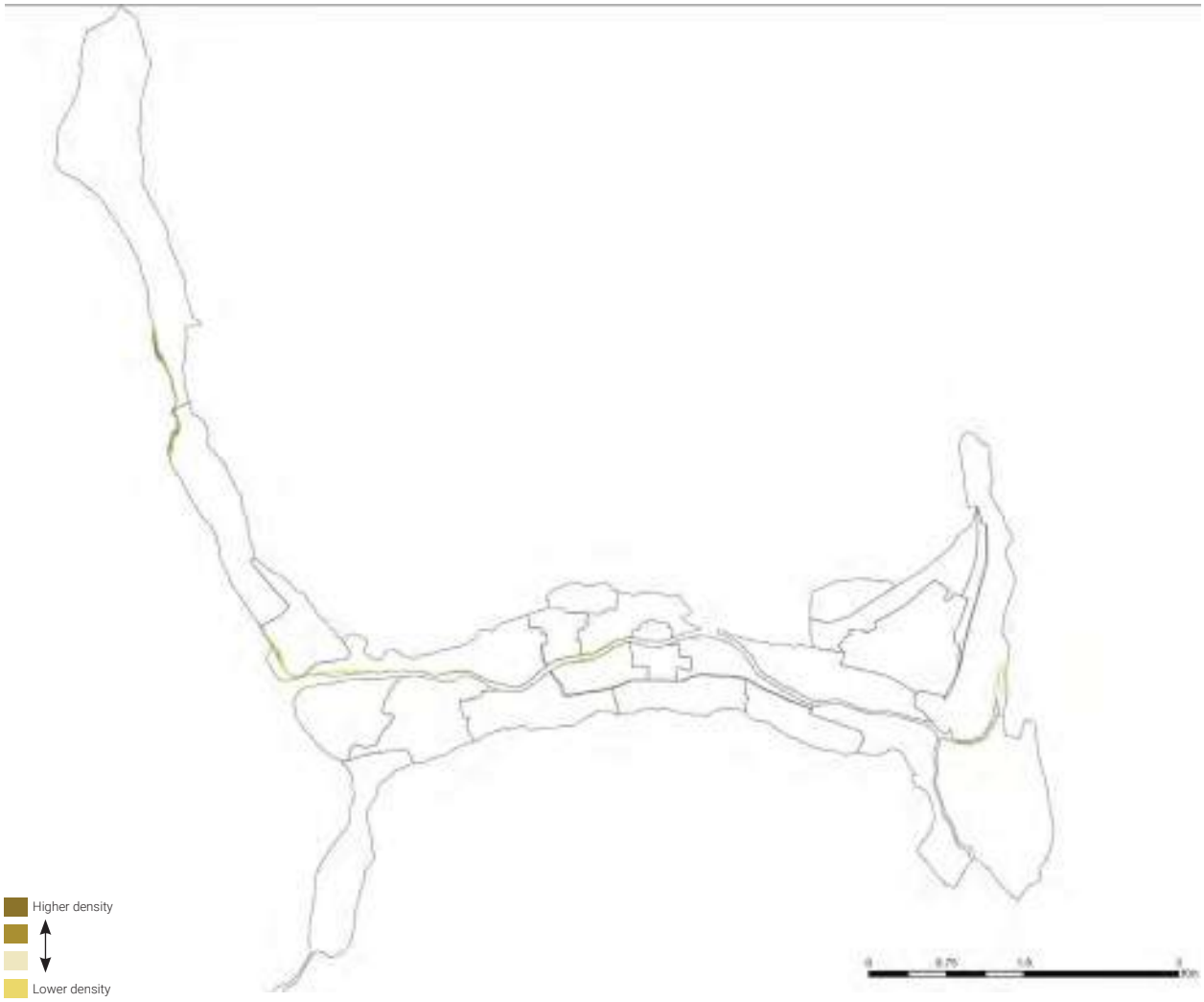


Fig 57. Highlighting the land at risk and frequency of riverbed erosion

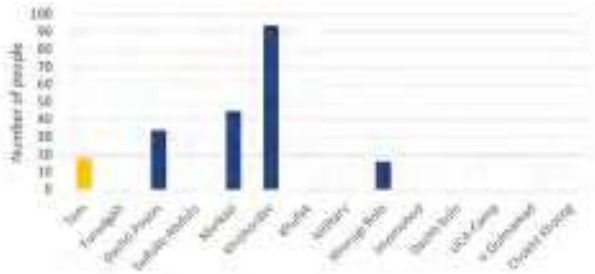


Fig 58. People impacted by, and the intensity of riverbed erosion in each Mahalla in the North

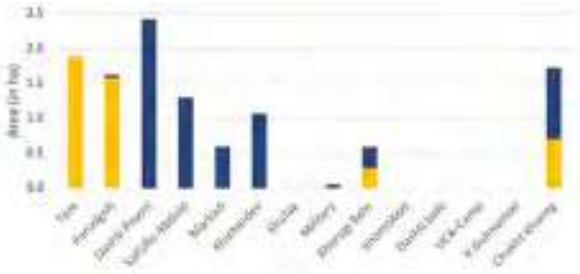


Fig 59. Area impacted by, and the intensity of riverbed erosion in each Mahalla in the North

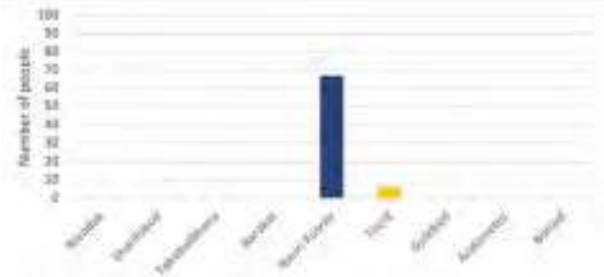


Fig 60. People impacted by, and the intensity of riverbed erosion in each Mahalla in the South

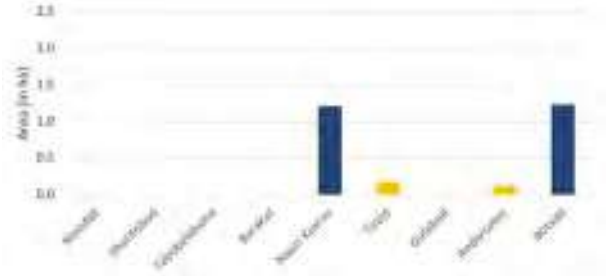


Fig 61. Area impacted by, and the intensity of riverbed erosion in each Mahalla in the South

Hazard Assessment Summary

Specific mitigation measures must address not only the type of hazard, but also the frequency, number of people at risk in the area and amount of land at risk. Understanding these variables can help to identify the kind of mitigation strategy required and the kind of preparatory approach needed in specific areas of the city. This can guide future development or limitation, densification, extension, and population relocation.

Rockfalls impact the most people and land in Khorog and suggests that current development in the city does not consider the existing threat of rockfalls. Further investigation, therefore, into the existing monitoring and incentivisation for development in areas that are at risk of rockfalls, as well as into existing rockfall mitigation measures and how they can be improved must follow from this diagnosis. Flooding, on the other hand has the lowest impact on people, but second highest impact on land. This suggests that when the city grows, mitigation against flooding is vital in order to acommodate for this growth.

Due to the impacts of climate change, leading to increasingly unpredictable and more frequent hazardous events, this assessment must be updated frequently. Whether additional steps are required to limit or monitor growth in certain areas of the city, or whether mitigation measures must be addressed are summarised and spatialised, highlighting the key neighbourhoods, in table 3.

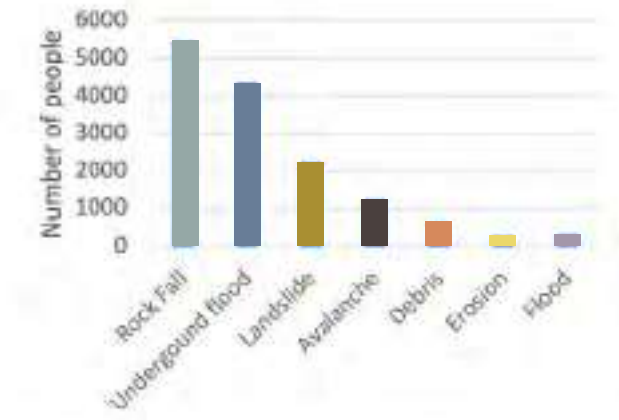


Fig 62. Priority hazards by population impacted

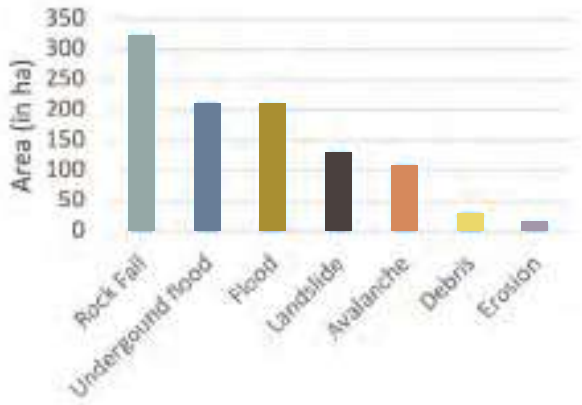


Fig 63. Priority hazards by area impacted

Type	Population Affected (no. of people)	Land impacted (ha)	Frequency (< 10 years, 10-30 years,> 30 years	Intensity	Population Affected (no. of people)	Land impacted (ha)	Priority Mahalla	Mitigation or Limitation
Rockfalls	4596	320	Frequent	High	4449	228	Saifullo Abdulo	Mitigation and Limit growth
Underground Flooding	4345	210	Frequent	High	3918	193	Chukht Khorog & Sharifobod	Mitigation
Landslides	2243	129	Frequent	High	485	17	Saifullo Abdulo	Mitigation (and partial limit growth)
Avalanche	1224	107	Frequent	High	32	3	Khichordev & Khorugi Bolo & Botsad	Limit growth
Underground Flooding	4345	210	Frequent	Medium	417	119	Tem	Limit growth
Landslides	2243	129	Frequent	Medium	673	48	Chukht Khorog	Mitigation and Limit growth
Overground Flooding	313	208	Frequent	Medium	313	209	Tem	Limit growth
Overground Flooding	313	208	Frequent	Medium	313	209	Nosiri Khisrav & Tirchid	Mitigation
Debris	629	29	Frequent	Medium	134	9	Nivodak	Mitigation and Limit growth
Erosion	280	14	Frequent	Medium	24	4	Tem & Furudgoh	Limit growth
Erosion	280	14	Frequent	Low	256	9	Kichordev	Mitigation
Erosion	280	14	Frequent	Low	256	9	Dashti Poyon	Limit growth
Debris	629	29	Frequent	Low	128	5	Barakat & Saifulo Adbulo	Mitigation and Limit growth
Underground Flooding	4345	210	Frequent	Low	19	0.6	Andarsetez	Mitigation
Rockfalls	4596	320	Generational	High	826	61	Nivodak	Limit growth
Avalanche	1224	107	Generational	High	161	26	Botsad & Furudgoh	Limit growth
Avalanche	1224	107	Generational	High	161	26	Tem	Mitigation and Limit growth

Rockfalls	4596	320	Generational	Medium	175	31	Botsad	Limit growth
Avalanche	1224	107	Generational	Medium	94	4	Nivodak	Mitigation and Limit growth
Debris	629	29	Generational	Low	391	15	Nivodak	Mitigation and Limit growth
Debris	629	29	Generational	Low	391	15	Markazi	Mitigation
Landslides	2243	129	Rare	Low	1562	99	Chukht Khorog and Dashti Bolo	Mitigation and Limit growth
Landslides	2243	129	Rare	Low	1562	99	Khichordev	Mitigation
Avalanche	1224	107	Rare	Medium	987	70	Gulobod	Mitigation and Limit growth
Debris	629	29	Rare	Low	32	2	Barakat	Limit growth
Debris	629	29	Rare	Low	32	2	Tem	Mitigation and Limit growth

Table 3. A prioritisation of neighbourhoods in Khorog requiring mitigation or development limitation, according to the risk of hazards

This assessment, therefore, provides an outline to the kinds of approach the city can take in order to create greater resilience to hazards. It informs the next steps of the project by breaking down a nuanced picture of hazard risk in each area of the city according to exiting conditions of population distribution and the type, frequency and intensity of hazardous events.

This demonstrates that currently a number of people and infrastructures are at risk to events on a broad scale of immediacy. This assessment is intended as a spatial tool to guide new development as the city grows and to identify the potential requirements for mitigation investment to accommodate this growth.

New construction in Khorog that stands out from the average building height of 3 storeys © UN-Habitat

2.3. SOCIO-ECONOMIC RESILIENCE

Major Economic Activities

High poverty and reliance on remittances from abroad due to low levels of economic opportunity in the country present challenges to the resilience of Khorog. This is exacerbated by the limited presence of a formal domestic private sector, which remains subservient to the informal economy. This can be addressed initially by planning for strategic nodal concentration and facilitating growth with essential, linking infrastructure. This should leverage existing points of interest and economic concentration within the urban footprint.

Promoting the development of economic nodes and major transportation hubs is important to provide better linkage between the city and the rest of the country. The airport of Khorog is an asset that can make Khorog more accessible to international visitors and thereby, facilitate the activation of several economic sectors such as tourism.

Protection of unique natural assets and landscapes (for example through forestation of local tree species, waste management and recycling) will contribute to both tourism development and local economy rooted in the traditions of the area (for example herb cultivation, gathering and natural medicines).

Economic Activities - allocation

As can be seen in figure 64, the most economically vibrant area of the city is concentrated in the center, along the main road. After the activation of other economic nodes and transportation hubs, the redevelopment of the public space network can also facilitate the creation of new economic activities.

The concentration of economic activities in the centre and the singular route entering the city with only one traffic light system for traffic mitigation, leads to high congestion levels in the area. This is worsened by heavy reliance on this area for all residents. Few alternative economic nodes are distributed throughout the rest of the city to provide equal commercial access at local distances.

Financial and administrative buildings are also concentrated in the centralized economic hub of Khorog. Additional facilities are located in Mahallai Dashti Poyon, alongside a subsidiary military area which forms a secondary node. Military areas and large administrative complexes can create 'dead space' in the fabric of the city, wherein mobility is interrupted and there is limited interaction between building uses and citizens. The frequency of administrative building use and their design can help or hinder the vibrancy of certain neighbourhoods. Changing the use of underutilized buildings to those of economic or community-based facilities could promote dynamic growth in the city centre.

As tourism has been outlined as a key opportunity for the city's economic development, certain cultural nodes were identified as important for conservation within the city, predominantly in the town center. Figure 66 shows cultural and religious buildings but also identifies areas of traditional housing adjacent to the central economic node. These areas may serve as attractors for tourism, especially as they lie adjacent to economic concentrations and the central market. Touristic activity could be encouraged through mapping, wayfinding and tour guides.

Diversification of economic nodes and alternative economic axes and promotion of existing heritage sites and traditional architecture can be supported by street design for key routes through the city, redevelopment of the public space network and reconsidering rarely used administrative buildings to feed into a wider economic strategy.

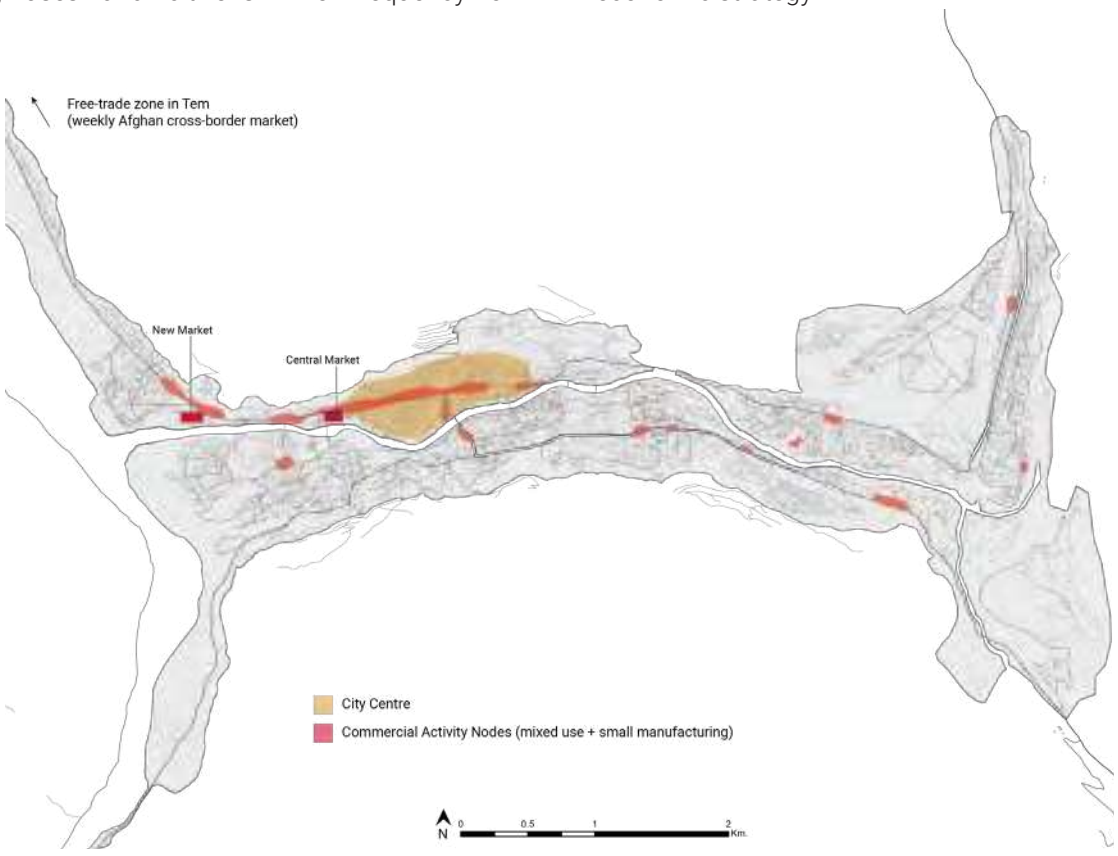


Fig 64. Commercial activity nodes in Khorog

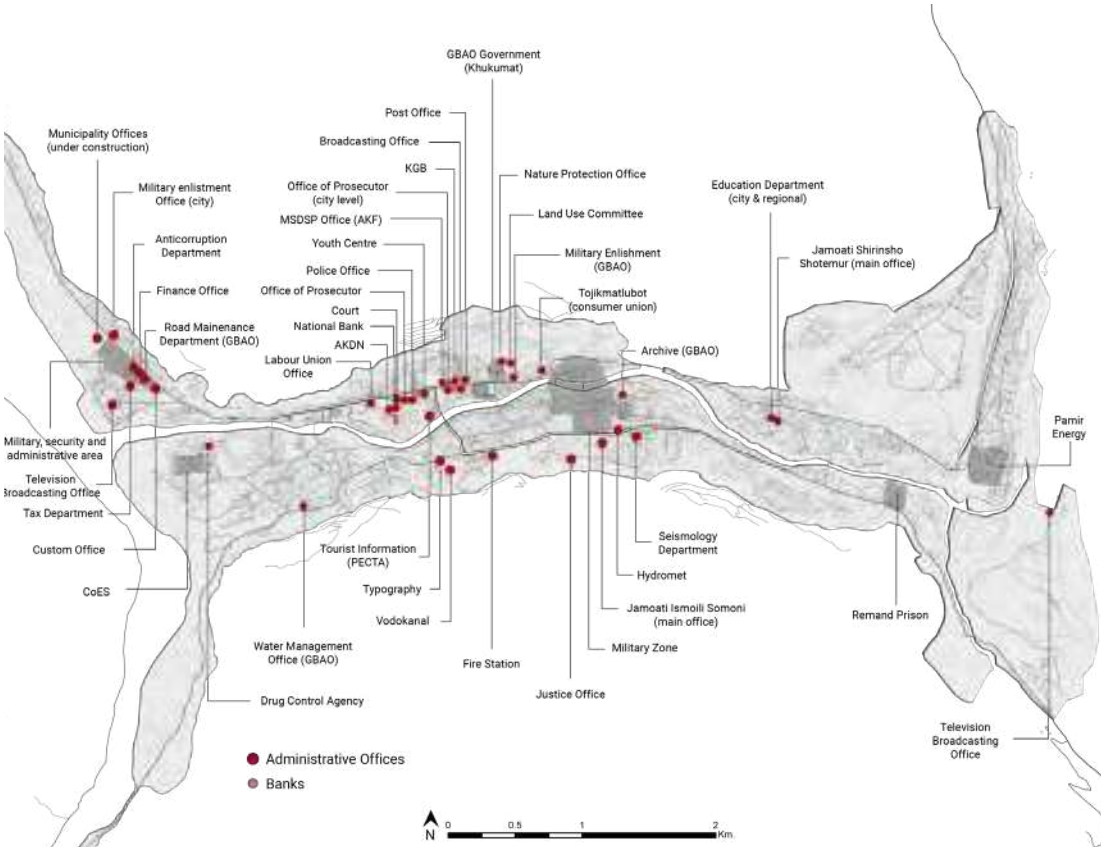


Fig 65. Administrative and financial institutions in Khorog

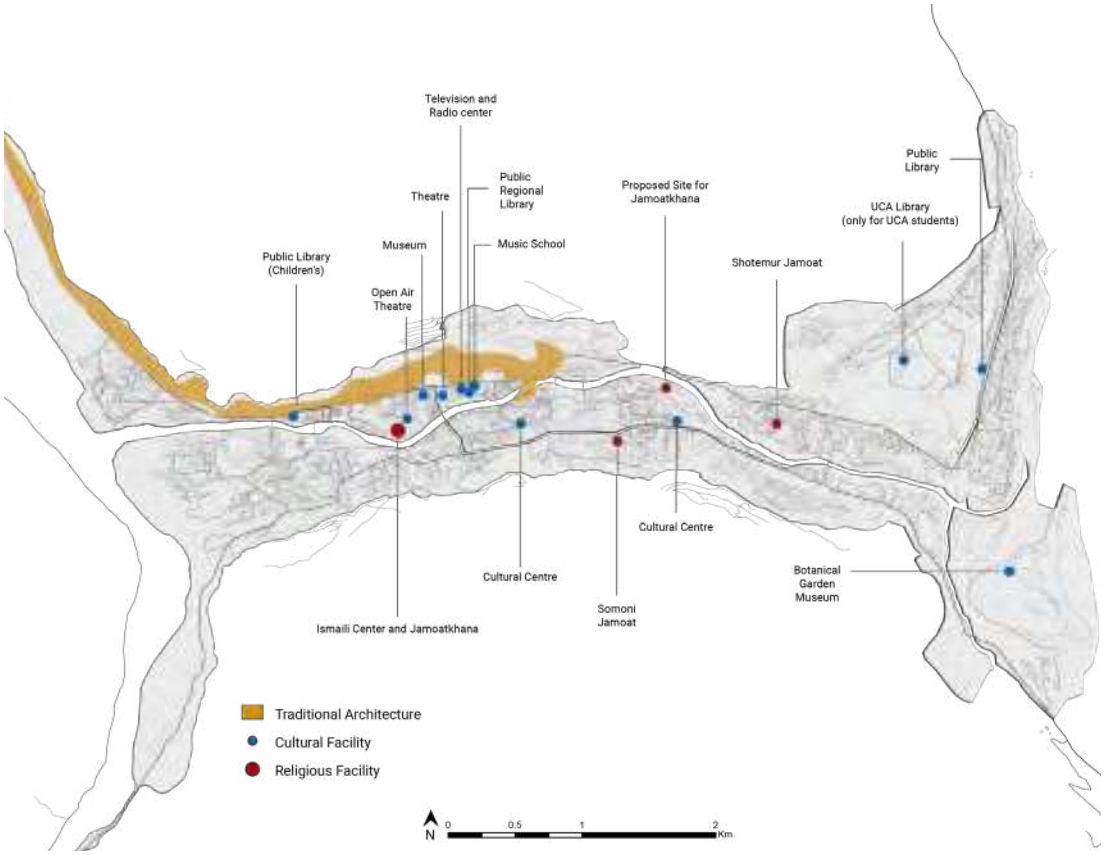


Fig 66. Cultural and religious institutions in Khorog

Economic Activities - access

To identify levels of access to economic nodes in the city, their distribution was compared cartographically with population density in an accessibility assessment. 11 economic nodes were identified in the city, which were usually comprised of a few, small-scale shops. Demographic data would have effectively indicated the accessibility of economic nodes for the city. However, as this data was limited, household data was used instead to show how one family can access economic nodes in the city, taking into account that 6 in 10 adults in Khorog have a source of income and the mean number of household earners is 2.3.[02] This means that the total number of households (5,120) was used in this assessment rather than the total population.

This spatial diagnosis of economic activities identifies:

1) The number of people that can access any economic in a 5, 10 and 15 minutes walk or within a distance greater than 2.5 km.
2) The number of households that can access each economic node in 5, 10 and 15 minutes walk.
3) The average walking distance (in minutes) from each mahalla to the closest economic node.

Rather than just indicating a radius from each node, this assessment of walking distance takes into account street permeability (which includes the number of street intersections) to more accurately indicate accessibility by foot and uses an average speed of 5km p hour/ 400m p 5 minutes.

This assessment uses the '15-minute city' concept to drive the accessibility diagnosis to help guide the densification of the city. Reducing walking distance to within 15 minutes for each node is part of the agenda of the '15-minute city' concept, which puts diverse community needs at the forefront of planning decisions, reducing costs of mobility infrastructure, reducing car dependency, increasing efficient and compact land use and basic services, and increasing public space safety and inclusivity. This assessment helped to show whether the current economic nodes were sufficient for the current population, or whether certain areas of the city lacked access to these areas.

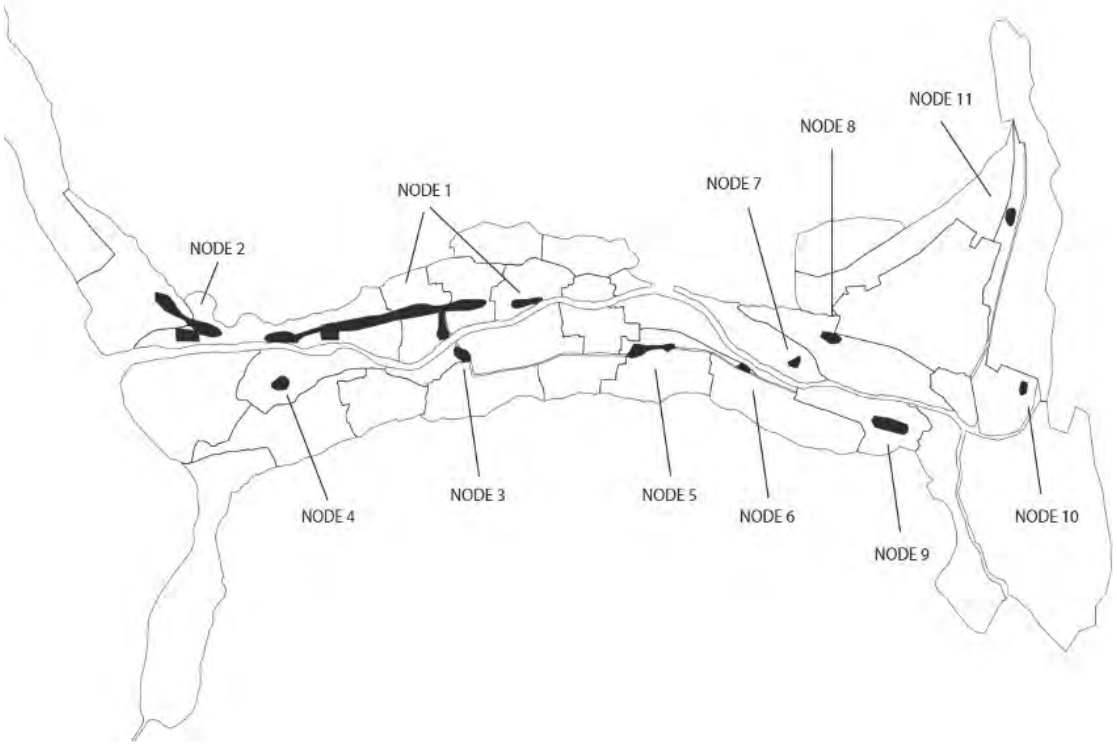


Fig 67. Economic activity grouping in Khorog

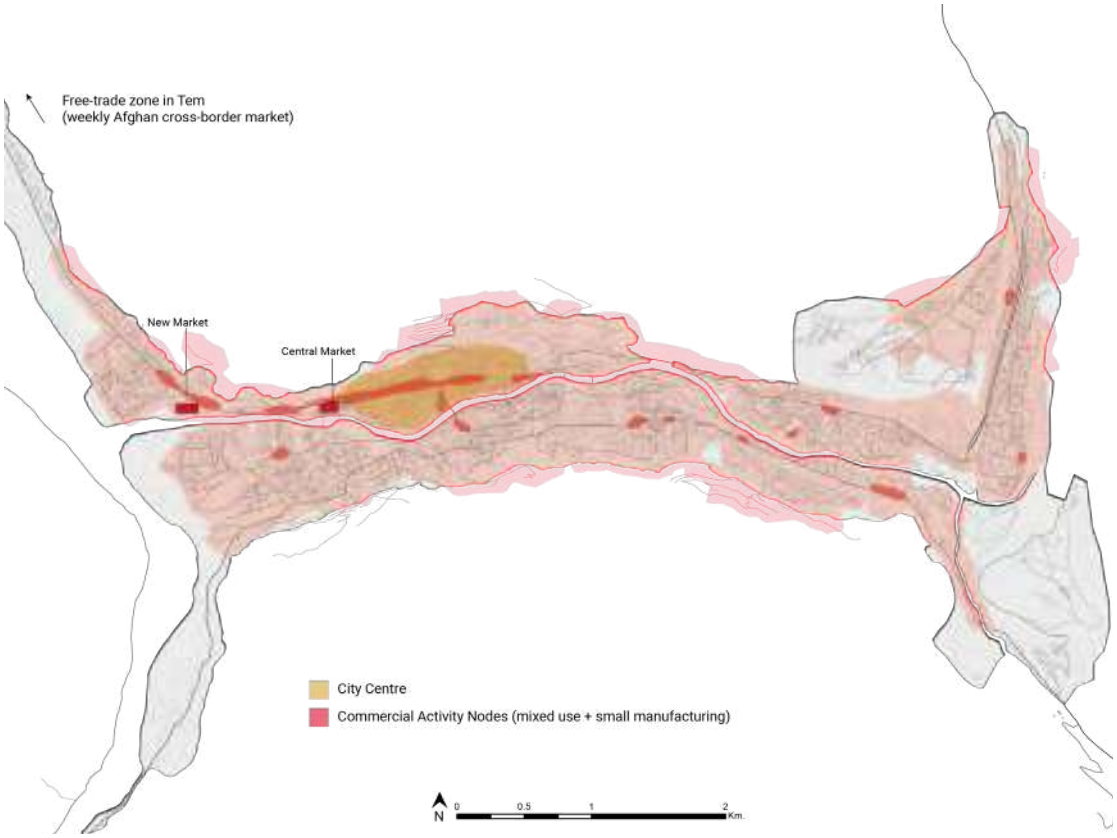


Fig 68. Accessibility to economic activity groups in Khorog (15 minute walking distance)

The assessment identified that 90.4% of the population in Khorog can access a site of economic activity within a 15 minute walk and only 4.6% must travel a distance of over 2.5km to access any economic nodes. However, although this assessment suggests a high level of accessibility, the sites that make up each node are relatively small and few in number. The most common of these shops provide basic food goods, are restaurants or car repair shops. Therefore, it is important to consider the capacity and demand for economic services in the city. It is understood that there is also a high unemployment rate in Khorog. To ensure economic growth takes place in a spatially balanced way, greater emphasis is needed on the development of these nodes in order to provide employment opportunities and adequate and diverse provision of goods across the city. Developing existing nodes such as node 4 in Tabobatkhona, and those in the East of the city that follow the main access route, will consolidate the existing economic activity most efficiently.

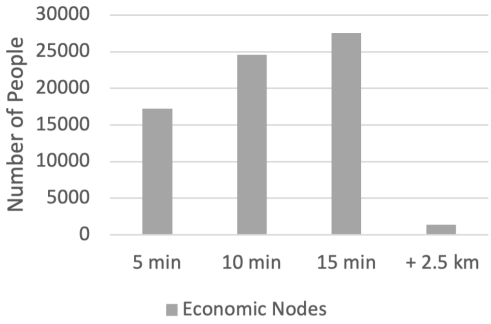


Fig 69. Number of people who can access any economic node in 5, 10 and 15 minutes, and those who must travel further than 2.5km

Disaggregated access figures show that Node 1 responds appropriately to accessibility demands of the higher density of households in the vicinity. It has the highest number of households within a 5, 10 and 15 minute walk than any other economic node in the city. Additional funding to grow capacity with an increased number of establishments can be considered for this node to ease access under the pressure it may experience as a result of its strategic location. As it serves a larger population group, further assessment could be used to guide an increase in establishments with a greater variety of services. This node contains a historical component, which may lend added attraction value. This area is substantially more compact in comparison with the spontaneous and dispersed nodes 2-10. The high population number serviced by this node highlights the importance of consolidation and development of those that are already compact. Other, dispersed nodes can be opportunities for consolidation, to accommodate a higher population density.

Node 10 and 11, in Chukht Khorog and Gulmamad, have a lower rate of walkable access, which can mean that residents must travel by car to access nodes in the East of the city. This also indicates that these areas have potential for increased development. Although nodes 10 and 11 present with low rates of walkable access, they provide commercial services to 5.7% and 9.2% of the population respectively and, thereby, fulfil an important function for the communities living in the Eastern side of the city.

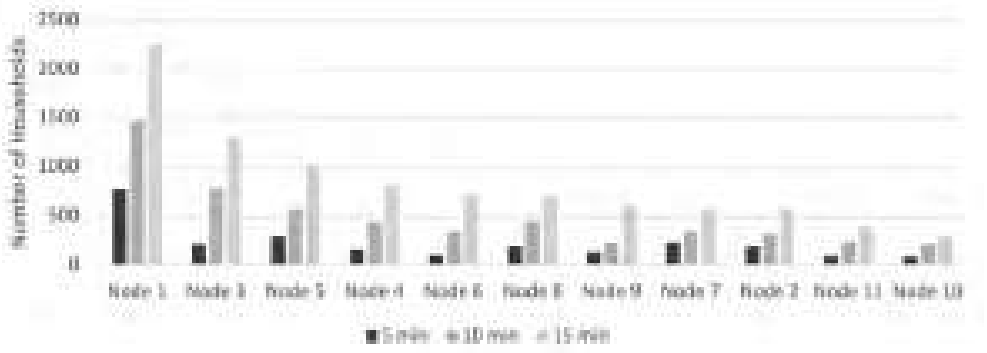


Fig 70. Number of households within a 5, 10 and 15 minute walking distance from an economic node

In general, it appears that the distribution of economic nodes within the city is aligned with population density, however, node 5 may not be appropriately sized nor adequately diverse for the high population density in Tirchid. Node 9, in Andarsetez, considering the large size of node, could accommodate a high population.

Finally, the average walking distance was assessed to indicate how equitable the distribution of economic activities is in the city, and to identify areas where residents may be forced to rely on public transport or private cars to access these economic nodes. Residents in Tem, Furudgoh, Imomobod, Nivodak and Botsad must travel further than 15 minutes to access any economic activity. This suggests that accessibility measures or additional sites of economic activity would reduce acess time. There is an imbalance as the average walking distances across the city, with a higher walking distance in the East and West, and a lower walking distance in the city centre.

Economic Assessment Summary

In conclusion, it appears that economic nodes are dispersed in a way that provides a high level of accessibility across the city. However, the size and capacity of these nodes may not reflect the population density in its vicinity, for example Node 5 in Tirchid. Other nodes like this one may also become insufficient for the city population as it grows if they are not expanded to support demand. Economic development in the city must be addressed to counter the current lack of employment opportunities in the city. Secondary economic nodes, or areas with a few, small shops, may help to reduce access times for those neighbourhoods that are currently lacking access, highlighted above, and to diversify the city's commercial focus away from the central area. These secondary areas present opportunities to generate a stronger economic nodal network in the city. Extending the existing economic activity along the main mobility axes through the city can help to ensure that economic growth strategies for the city accompany those of mobility.

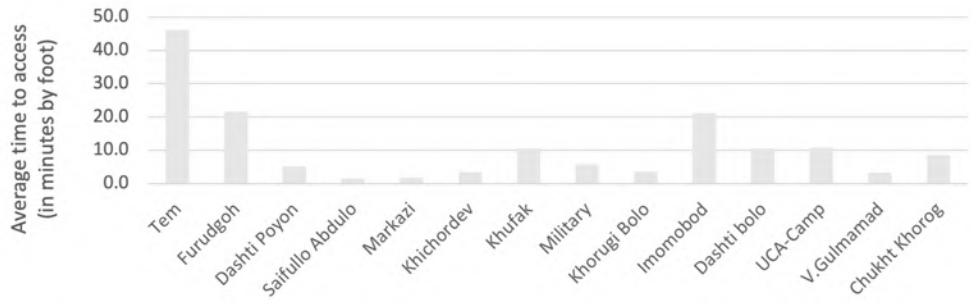


Fig 71. Average time to access economic nodes by foot for each Mahalla in the South of the city

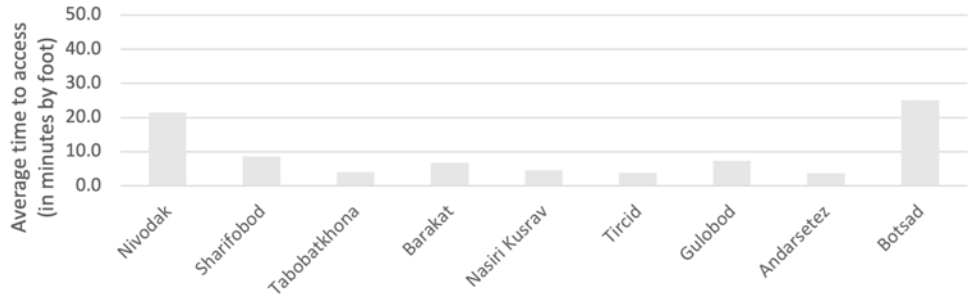


Fig 72. Average time to access economic nodes by foot for each Mahalla in the South of the city

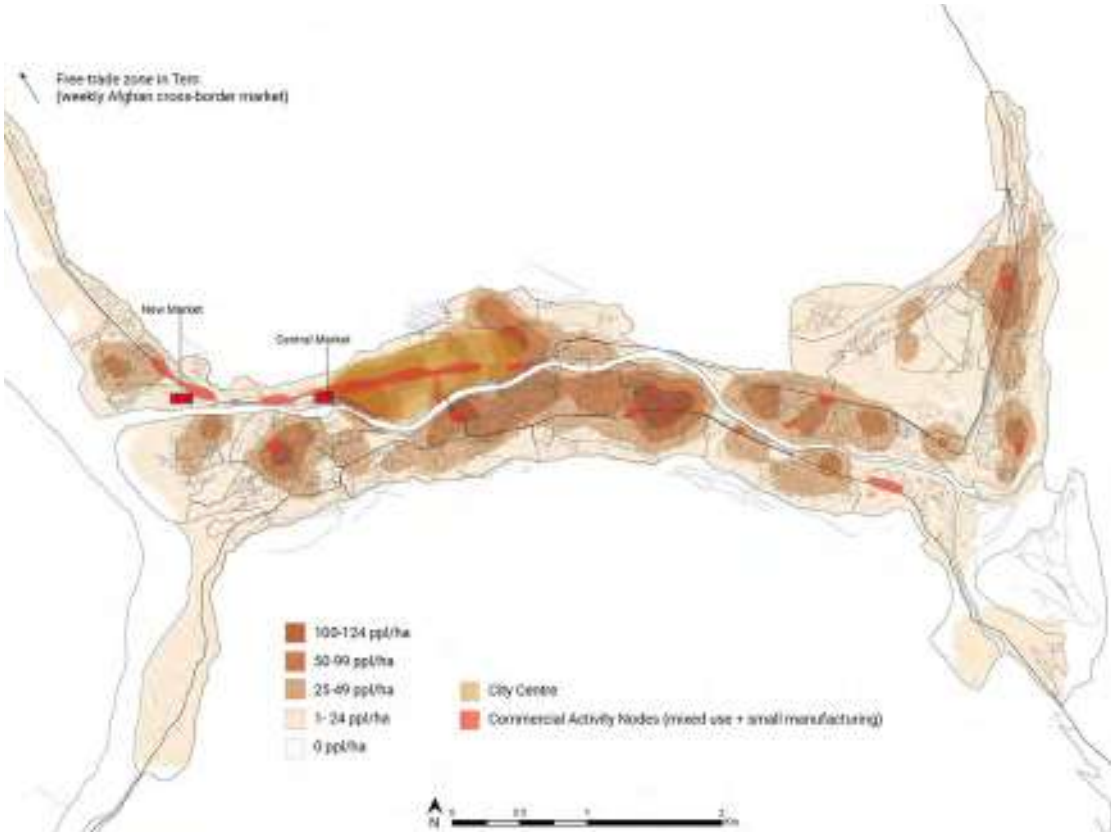
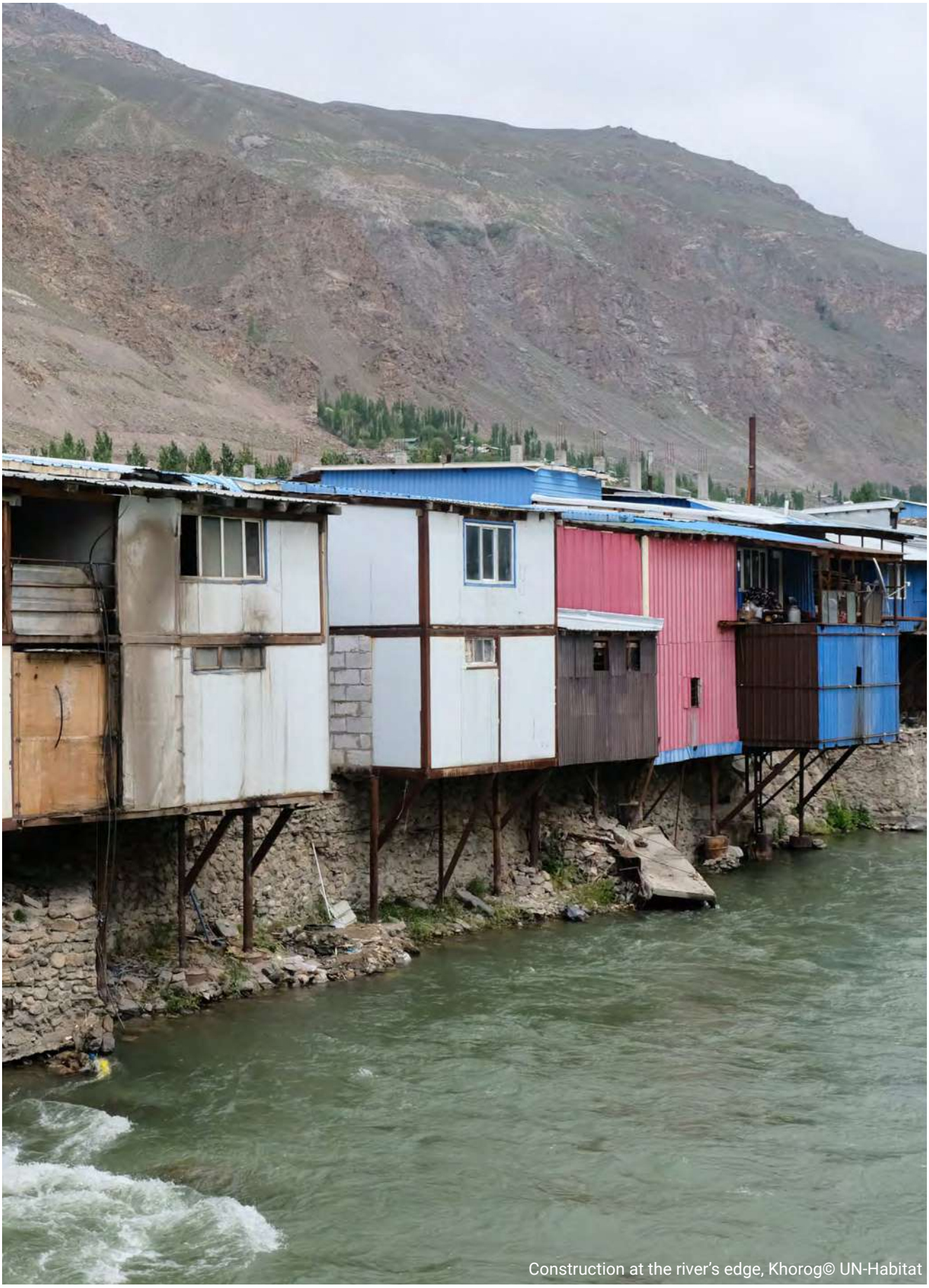


Fig 73. Economic nodes and population density overlay



Construction at the river's edge, Khorog© UN-Habitat

2.4. RESILIENT INFRASTRUCTURE AND BASIC SERVICES

2.4.1. Utilities Assessment

Access to basic services is a major challenge for the city, in particular those of water and sewerage. Water is not only necessary for household use but for irrigation. This means that access to water impacts agricultural production and household income, as well as forestation efforts to reduce the impact of hazards and to improve air quality.

Air quality is an issue between October and March when communities must burn leaves and wood for fuel as electricity supplies are unreliable during this season. Electricity is supplied from hydropower, meaning that the city is vulnerable to instances of river freezing during winter or where the water level drops.

Due to current limitations in access to the formal water network in the city, many households connect informally to the existing network or to open water channels. Natural water sources and seasonal flooding can provide water for irrigation. However, if these sources are formalised, and re-routed, these areas may become deprived, which impacts agriculture and sources of production.

Therefore, the utilities assessment considers whether the existing utilities infrastructure is adequate for the current population of Khorog, which areas lack access, and which are oversupplied by the network. The assessment compares the supply (based on the extension of the existing network and capacity – based on size and flow rate), with the demand (based on population density data and proximity to the existing supply network).

The assessment projects a scenario wherein each household is connected to the network via the closest pipeline. This data highlights how the existing infrastructure responds in circumstances where it is used to its full capacity and indicates potential areas for increased development.

Therefore, the assessment includes:

1) The existing network quality and coverage to highlight existing challenges.
2) Planned infrastructure and forecasting to highlight 'development potential' areas within the existing service network, and potential challenges in future scenarios.

Water – demand and access

A number of investments have improved the water network substantially, including the use of polythene for a number of pipelines, planned borehole construction, and a new reservoir. However, access to water is still below the desired level.

In certain areas, there is no access to the water network and no alternative source of water. In other areas, there is no network access but there are informal water sources, such as natural springs (for example in Mahallai Khufak and Khichordev) or close proximity to the existing reservoir (in Mahallai Gulobod). Some areas may have a water supply but the network capacity does not match the population demand in the area. Some areas have a good water supply capacity that isn't being fully utlized. Finally, some areas of the city such as those at higher elevations are more challenging to provide with water through the formal system, requiring additional pumping mechanisms.

Therefore, a number of water access measures must be implemented, specific to the needs of each area. Each of these measures must be considered in an integrated way, to ensure that their independent impact is accounted for. For example, re-directing natural water supply to the formal network infrastructure must accommodate for the loss in supply that will be experienced in other areas.

9 of 23 Mahalla do not have a high water supply capacity. There are three areas that require improved access to the water supply through an extension of the existing network. In order of priority, these are in the West (hospital uplands area, Mahallai Tabobatkhona), Tem, and the South Central area.

The south-east area (Gulobod and Barakat) shows a greater potential for densification, due to the greater land area with a good concentration of network infrastructure. The condition is similar in the north-east area (Valdosh Gulmamad and North of Chukht Khorog), in which the water pipeline system is capable of handling increased demand (based on diameter and potential flow).

However, these calculations cannot account for impacts on actual water flow caused by substantial leakages in the pipelines and informal water extraction. This means that although the network is in place in many areas, water supply could be better regulated, for example through water meters, to fully understand and regulate capacity and use to provide a more reliable supply.

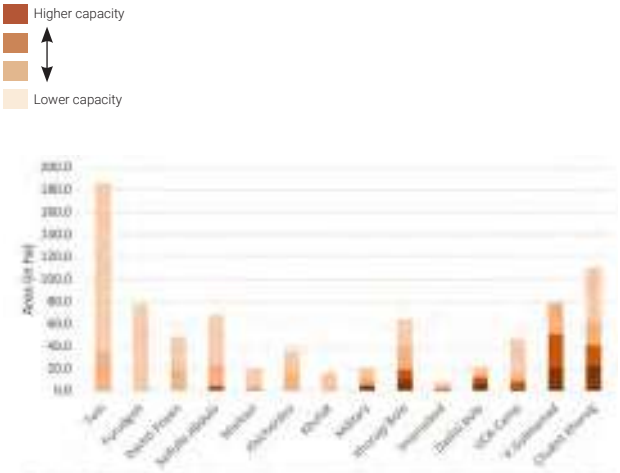


Fig 74. Water capacity in Mahalla in the North of Khorog

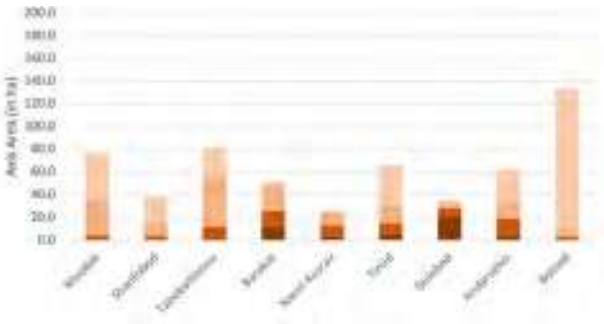


Fig 75. Water capacity in Mahalla in the South of Khorog

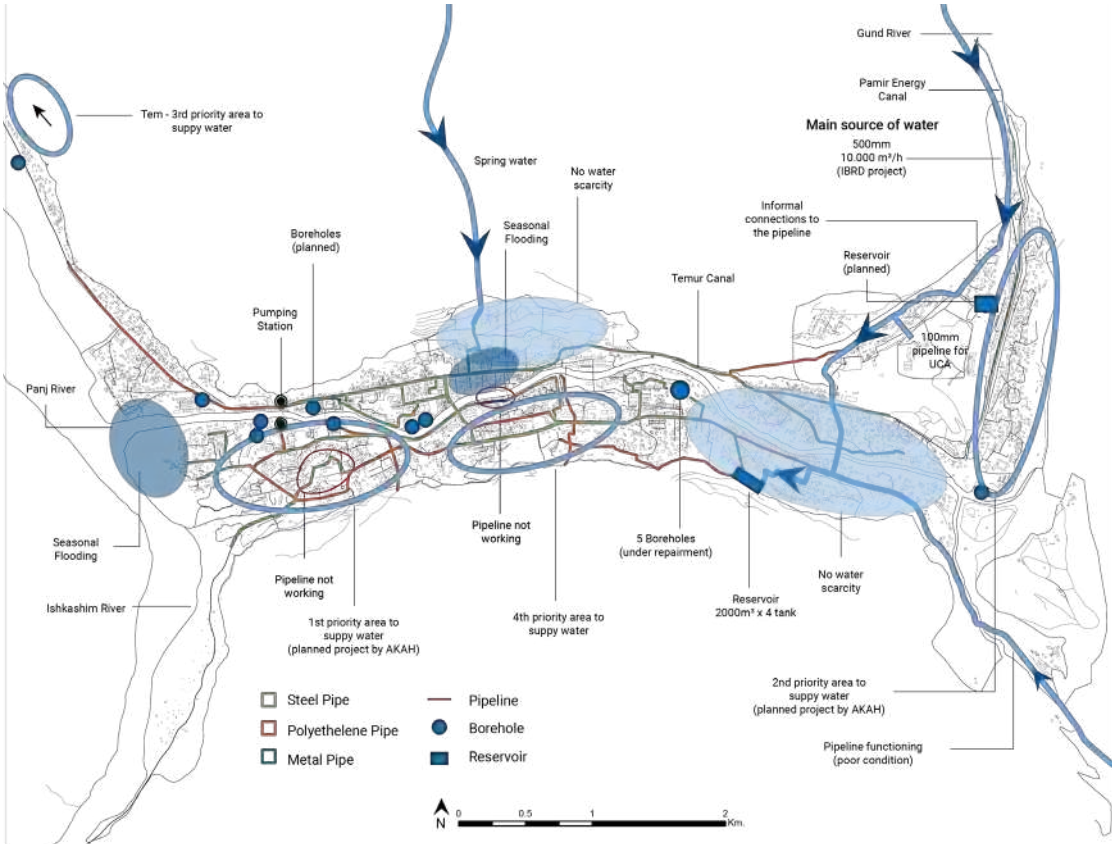


Fig 76. Existing water network, infrastructure and pipeline material (including informal sources, flooding and challenges)

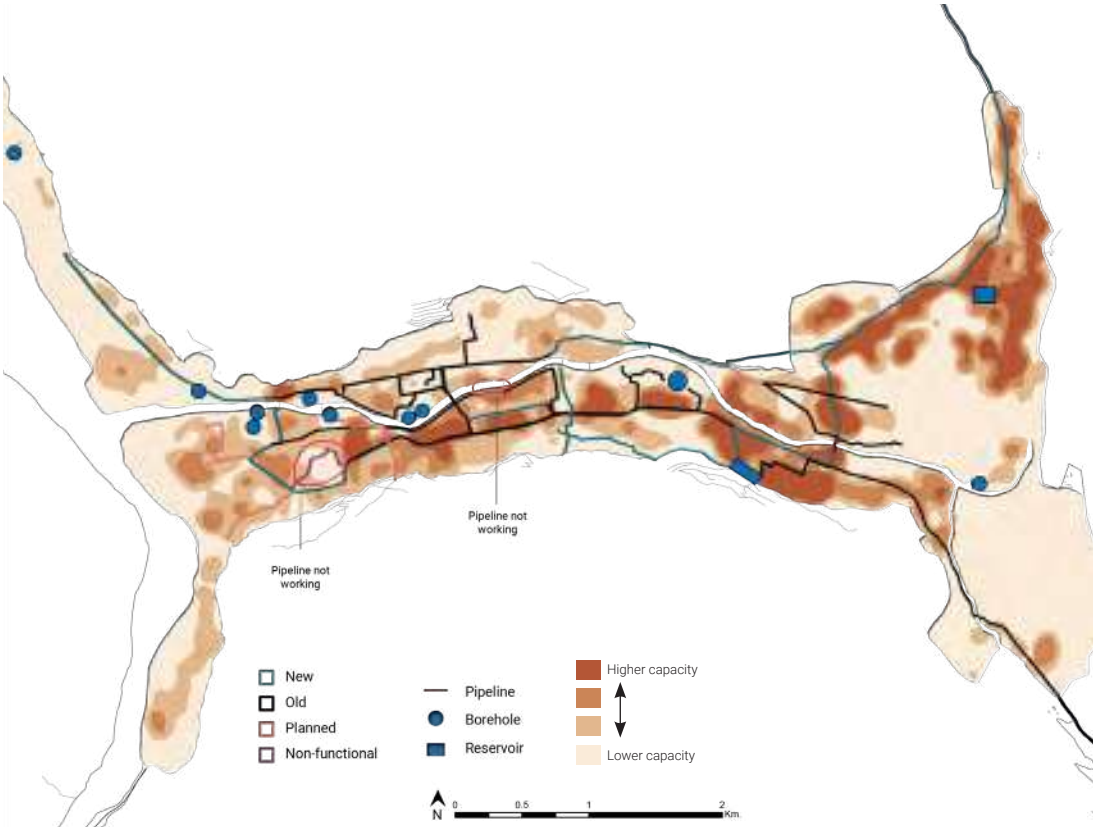


Fig 77. Water capacity (assuming all households are connected to the existing and planned network)

Sanitation – demand and access

The sewerage network is comprised predominantly from cast iron pipes and is largely reliant on gravity, rather than providing a pressure system, which is currently only present in one section of the network (in Mahallai Saifullo Abdulo). The sewerage network does not offer full coverage for the city and many households use septic tanks.

There are a large number of dumping sites throughout the city that consist of designated, open areas. Waste from containers on these sites are taken to a landfill 14km south of the city. A limited waste management system means that dumping sites are not emptied regularly. Furthermore, the landfill has no treatment facilities and there is grey water discharge that runs into and pollutes the river. Finally, certain neighbourhoods lack provision of dumping sites completely, such as in Nivodak and Khufak. This leads to informal waste disposal, which creates air, soil and water pollution through burning or disposal into waterways.

A total of 8 out of 21 Mahalla have an area of high capacity sewage infrastructure. Areas that do not, rely on septic tanks without basic disposal or filtering facilities. This low coverage may limit the potential for urban development in these areas. The majority of the existing pipelines have a high capacity measured in diameter and flow. These are found in the city center and along the central river. This area, therefore, has a high potential for increased development with access to the existing network.

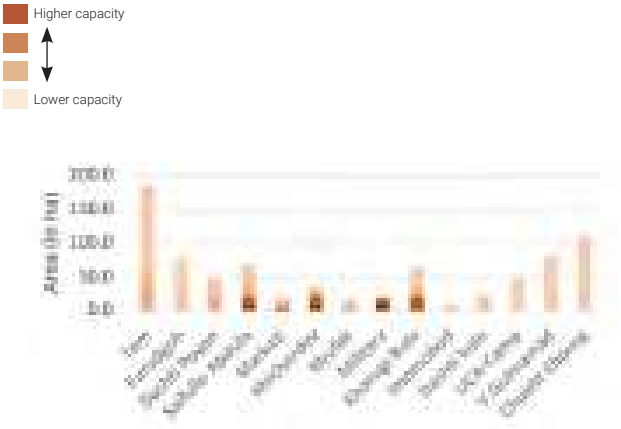


Fig 78. Sewerage capacity in Mahalla in the North of Khorog

Fig 79. Sewerage capacity in Mahalla in the South of Khorog

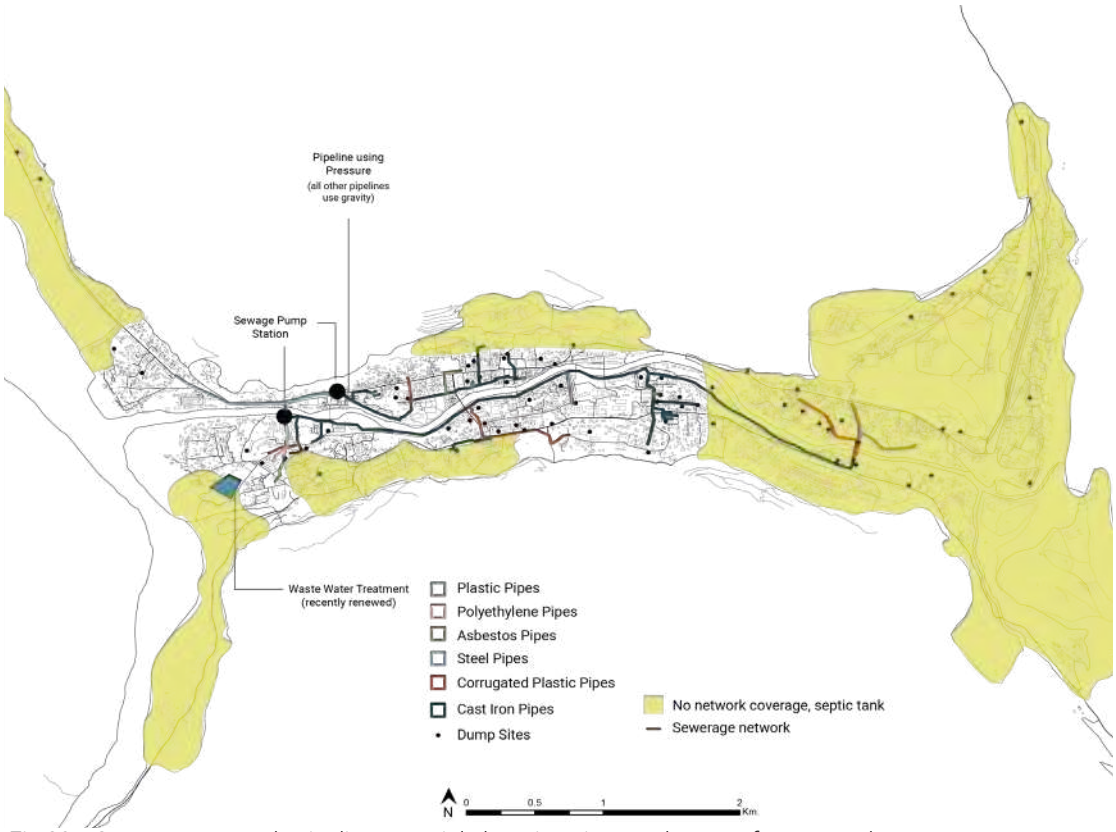


Fig 80. Sewerage network, pipeline material, dumping sites, and areas of no network

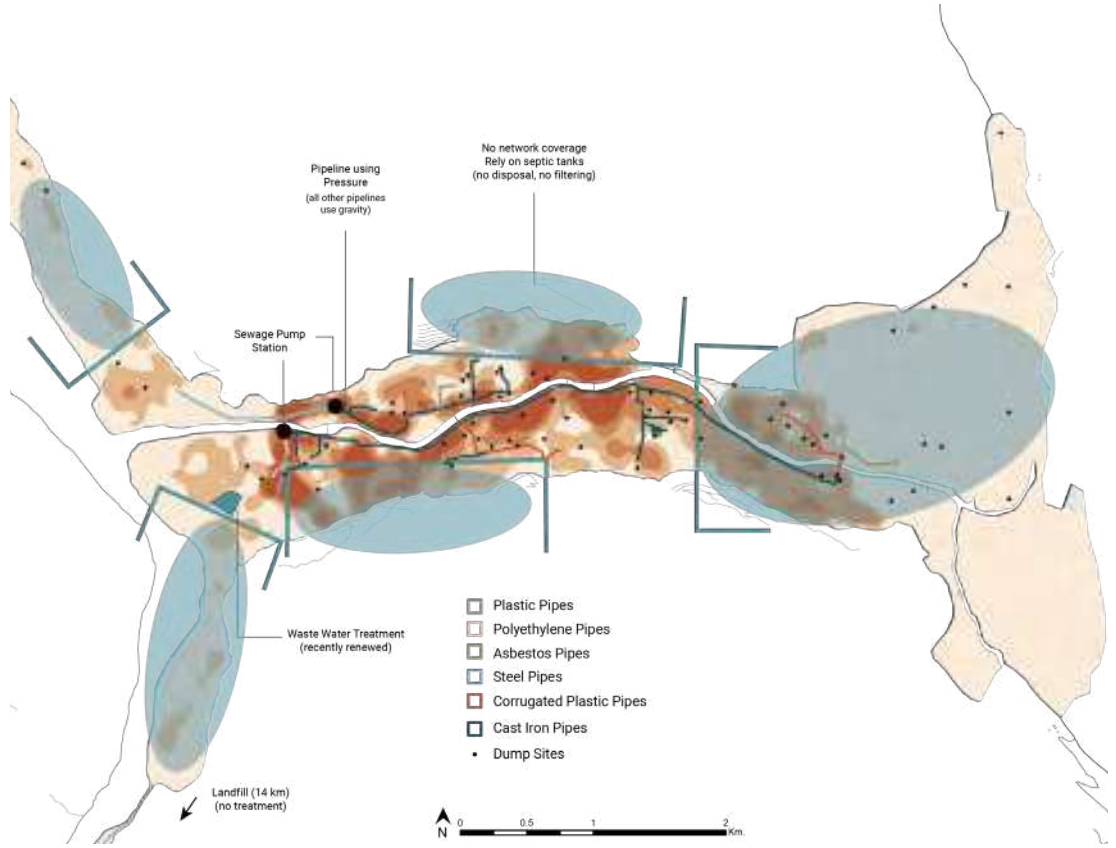


Fig 81. Sewerage capacity (assuming all households are connected to the existing and planned network)

Overlaying the areas of the city with no network coverage and areas that experience groundwater flooding, visualizes the potential for septic tanks to contaminate the city's water supply. This assessment helps to show not only the issue of sewerage network access, but also how limited access can impact the wider water supply. Therefore, improvements to the network must come hand in hand with non-spatial strategies to limit water pollution and regulate waste disposal.

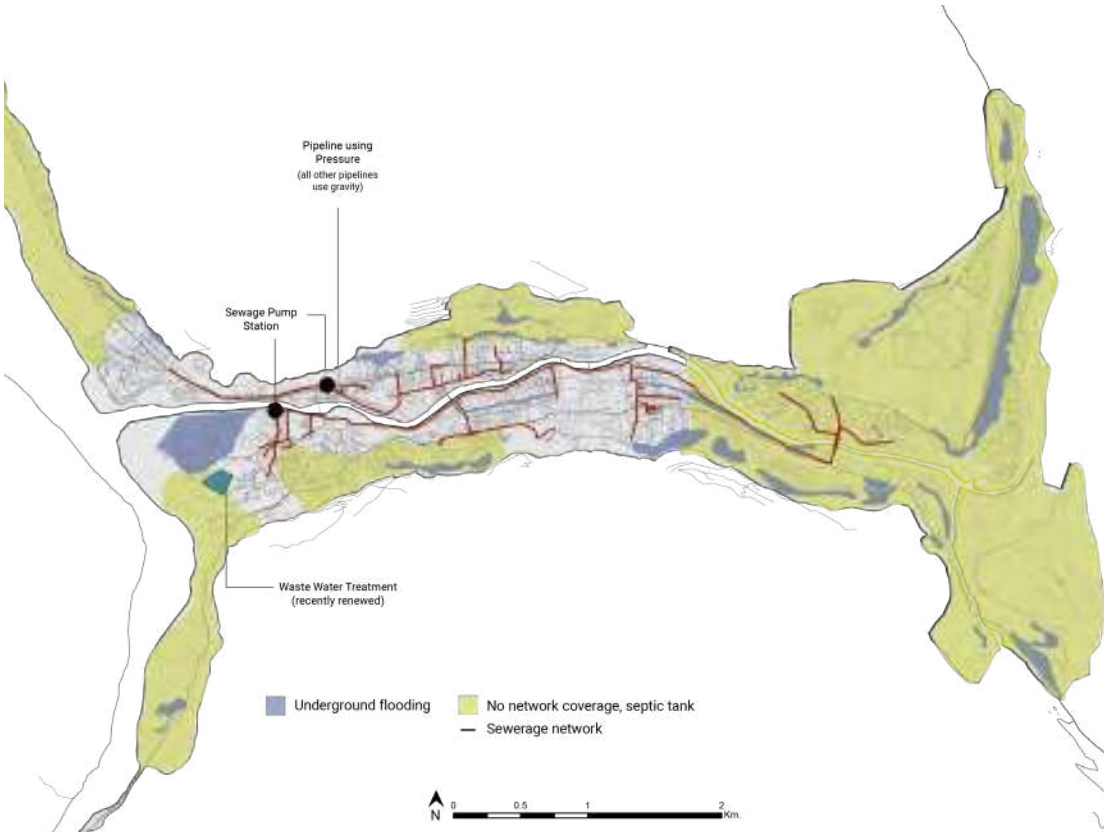


Fig 83. Sewerage network and underground flooding areas

Energy – demand and access

Electricity supply has a high extension and coverage in Khorog, with a number of transformers across the city. Some challenges associated with energy surges are being addressed, and there is a plan to move some electricity lines underground. Large areas without energy supply correlate with areas of low density or those lacking infrastructure, for example (Botsad, the airfield, and the UCA campus). Therefore, energy supply accommodates the current population density, however, smaller nodes or specific buildings may need to be considered further to facilitate supply at this scale.

An increase in supply efficiency is underway, however this can be increased through identification of densification nodes, an integrated approach to service supply and planned projects, and a clear strategy for city growth, to ensure that any works fit within a plan for expansion or densification.

With an increased demand, this network will need to be maintained and surge issues will become increasingly challenging if not addressed. Storage systems and non-hydro reliant energy sources must be prioritised to solve current interruptions in supply and to benefit the future growth of the city.

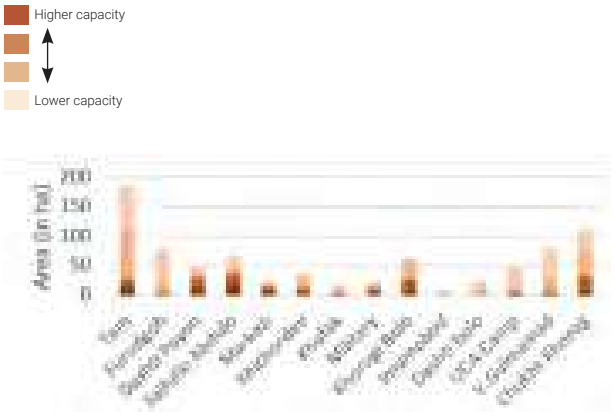


Fig 85. Electricity capacity in Mahalla in the North of Khorog

Fig 86. Electricity capacity in Mahalla in the South of Khorog

Fig 84. Electricity capacity (assuming all households are connected to the existing and planned network)

2.4.2. Utilities Assessment Summary

Saifullo Abdulo, Tabobatkhona, Barakat, Gulobod and Chukht Khorog are areas that present a high capacity to accommodate a high population density considering the existing water, sewerage and electricity networks. On the other hand, Nivodak, Sharifobod, Khufak, Kichordev, Imomobod, Dashti Bolo, Chukht Khorog and Andarsitez, among other smaller areas of the city, lack capacity to accommodate a high population due to lacking water, sewerage and electricity networks.

This not only helps to identify potential areas for increased development, but also demonstrate how network improvements can offer greater potential for densification elsewhere. Peripheral areas in the city are less connected to both water and sewerage networks and therefore, require network extensions in order to better support their populations. This suggests that a densification strategy, rather than expansion of the urban boundary may be more suitable to maintain balance between utility provisions and population density. Considering the cost of infrastructure and maintenance provision for coverage over long distances and over high topographies, improving capacities of existing networks and ensuring more efficient use may prove more sustainable and financially acheivable.

In summary, electricity supply reaches the highest coverage area in the city, with the highest capacity. Figure 89 indicates that the areas of highest population density can be accommodated by the existing network. However, there is limited consistency in energy supply, meaning that storage units and solar panels to combat surges and oversupply, require coordination and financing mechanisms to implement.

Fig 87. Area of land with potential for high density use per utility

Water availability during many months of the year is currently not scarce in the city, however, improvements to the network should be a priority due to low formal coverage. Water impacts the environment, economy and survival of the city. Specific measures to improve formalised access, however, must acknowledge the current informal supply, meaning that expansion of the network should not redirect natural sources without due consideration to access limitations this may create at those natural sources. Using the existing water supply more efficiently and monitoring use is crucial to ensure equitable and efficient access, whilst ensuring this resource is distributed sustainably.

As the availability of water may change over time due to climate change, leading to shortages or unpredicatble and more extreme flooding, it is necessary to consider the challenges associated with accessibility as well as usage monitoring now.

Finally, the sewerage network has the lowest extension of all utilities in the city and the lowest capacity. Although this may not be perceived as an immediate threat to the community in the same way as does electricity and water supply limitations, waste management and infrastructure challenges will lead to a polluted water supply. Overuse of plastic and lack of recycling exacerbates this challenge.

Strategies for improving urban basic services must be spatially integrated and policy based. They must integrate all service networks and provide a city-wide and neighbourhood level regulatory framework, without which, private construction may continue in ways that are ill-aligned with service infrastructure extensions. Maintenance and management processes and financial mechanisms are key to ensure a sustainable approach to basic service provision.

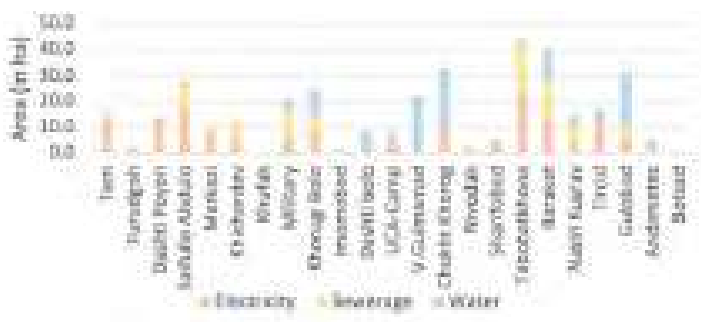


Fig 88. Amount of area per neighbourhood with a high capacity, and potential for high density

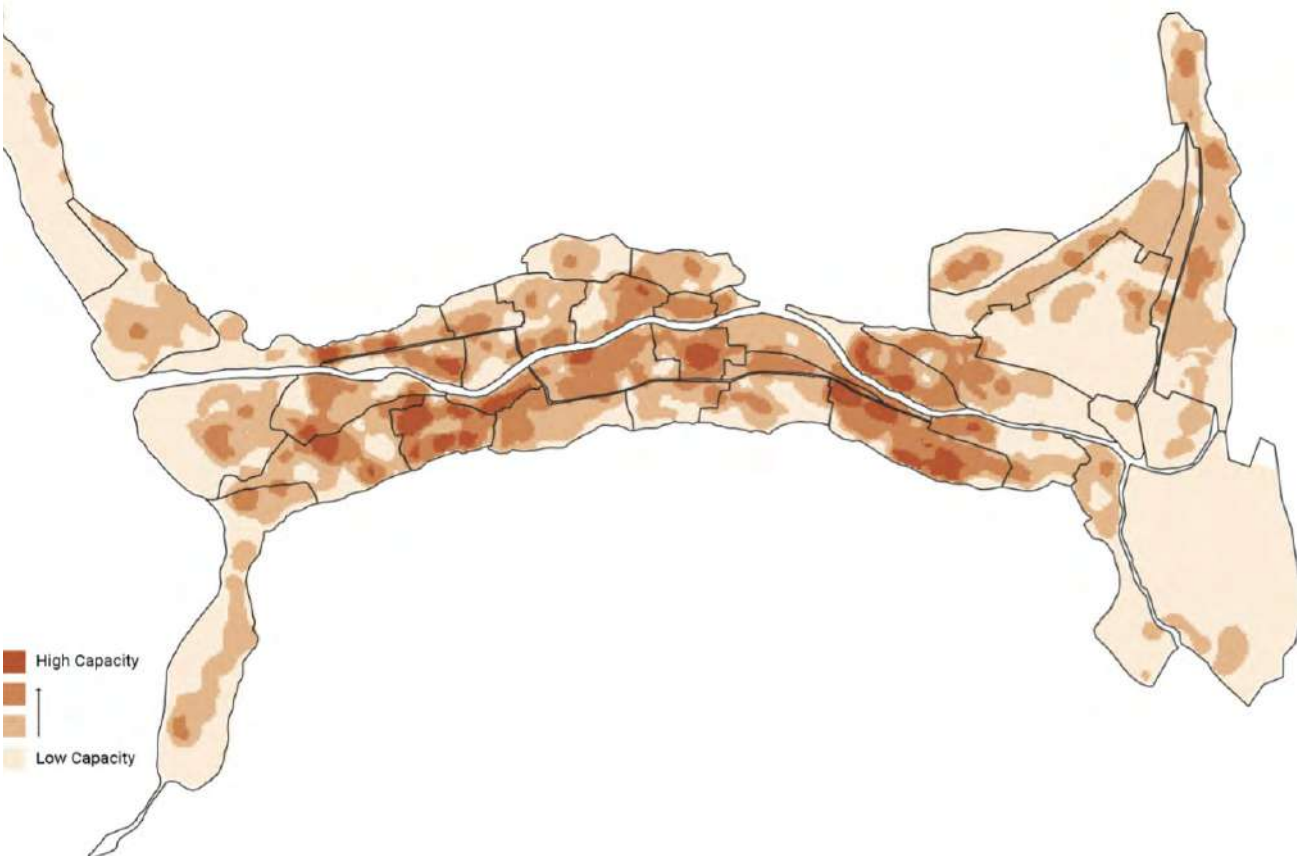


Fig 89. Areas of the city that could support a high population density if all households were connected to all utilities networks (according to the current capacity of the water, energy and sewerage networks)

Sports Facililty, Khorog © UN-Habitat

2.4.3. Public Facilities Assessment

This diagnosis identifies the extent to which public facilities in Khorog are equitably distributed and are sufficient for the current population. It assesses both how the provisions of public facilities reflect the current population density and the degree of accessibility to these facilities. Not only does this assessment highlight the extent to which public facilities respond to existing need but it also provides an indication of areas that have the potential to accommodate future growth.

The public facilities assessed here include those of education and health. Specialized health centers have not been included in the health section of this assessment. This is because these specialized facilities are required in rarer instances and therefore, they are not required as a day-to-day service for the general population. This assessment uses only non-specialized facilities to provide a diagnosis based on general accessibility.

Population data has been used as a basis for a diagnosis of health facilities distribution and access, whereas household data has been used in the assessment of education facilities. This is because disaggregation according to age, that would be pertinent to the education assessment, is unavailable.

Therefore, this assessment of public facilities in Khorog considers the following:

1) Access by walking distance (5, 10 and 15 minutes or distance of greater than 2.5km), taking into account street permeability (which includes the number of street intersections).
2) Access by average current walking distance. This is measured in minutes walking (using an average speed of 5km p hour/400m p 5 min).
3) Demand calculated by the population density in proximity to each health facility. This is identified by cross-referencing the distribution of facilities across the city with the number of people that would consider that facility as its closest.

The demand assessment identifies the level of pressure on each facility according to its location and the population density of the surrounding area. However, more specific capacity data can provide an even more accurate assessment that would identify facilities which may face insupportable pressure, those which may not be operating to their full capacity, and areas which may be able to accommodate a higher population density in future. Therefore, the demand assessment deployed here can be used as an initial guideline to be developed further with additional data.

Heath Facilities – allocation and access

Khorog has a number of health facilities distributed throughout the city. These have a variety of capacities and purposes. Due to the regional role that Khorog plays in the GBAO, these may serve as primary healthcare facilities not only for residents of Khorog, but also for further settlements within the region at large.

The facilities located within Khorog include:

- Khorog Medical Center - UCA campus
- Regional Hospital - Shifokhona
- Hospital (cardiology) - Ayni
- Policlinic - Shotemur
- Hospital campus 3 - Dehqonkhona
- Medical Center - Shifokhona
- Policlinic (medical school) - Paschid
- First aid post – Tem

The majority of these facilities are publicly owned, with the exceotion of the Khorog Medical Center - UCA campus, which has been removed from this assessment due to access limitations.

First looking at the number of people who can access each health facility within 5, 10 and 15 minute walking radius, allows us to consider the number of people who may depend on this facility, as well as highlighting the strategic placement of the facility – whether it is within a highly populated or sparsely populated area. This can inform on oversupply or help to identify potential areas for densification.

In total, 59.8% of the population can access a health facility within a 15 minute walking distance. 33% of the population must walk more than 15 minutes, and 7.2% must travel more than 2.5km to access a health facility. More equitably distributed facilities could increase healthcare access in the city, for example in Nivodak. Alternatively, improving connectivity and pedestrian routes could help to increase access in other areas, such as Gulobod. This assessment shows that both approaches are necessary in the city.

7 Mahalla have an average walkable distance to a medical facility of within 5 minutes. Botsad has the longest average walking time at just under 40 minutes, however, the area also has a low population density, whereas Imomobod and Dashti bolo both have a high average walking distance and a high population density. These areas should be considered as priority for interventions either to improve connectivity or to provide additional health facilities to reduce average walking time.

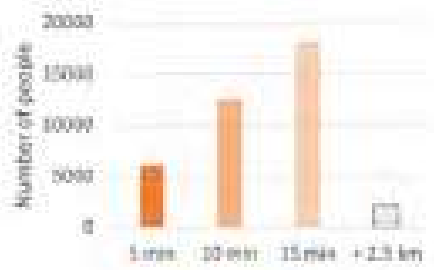


Fig 90. Number of people who can access any medical facility in 5, 10 and 15 minutes, and those who must travel further than 2.5km

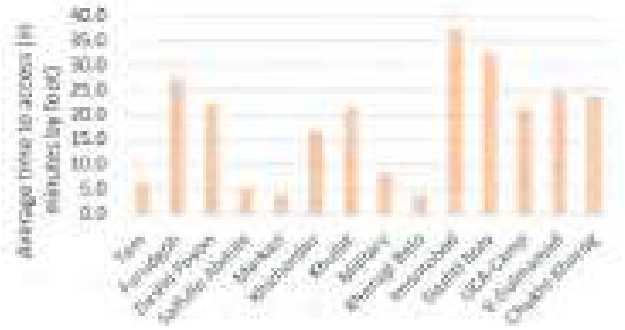


Fig 91. Average time to access any health facility by foot for each Mahalla in the North

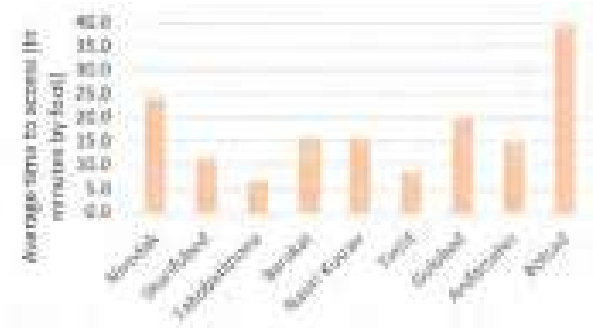


Fig 92. Average time to access any health facility by foot for each Mahalla in the South

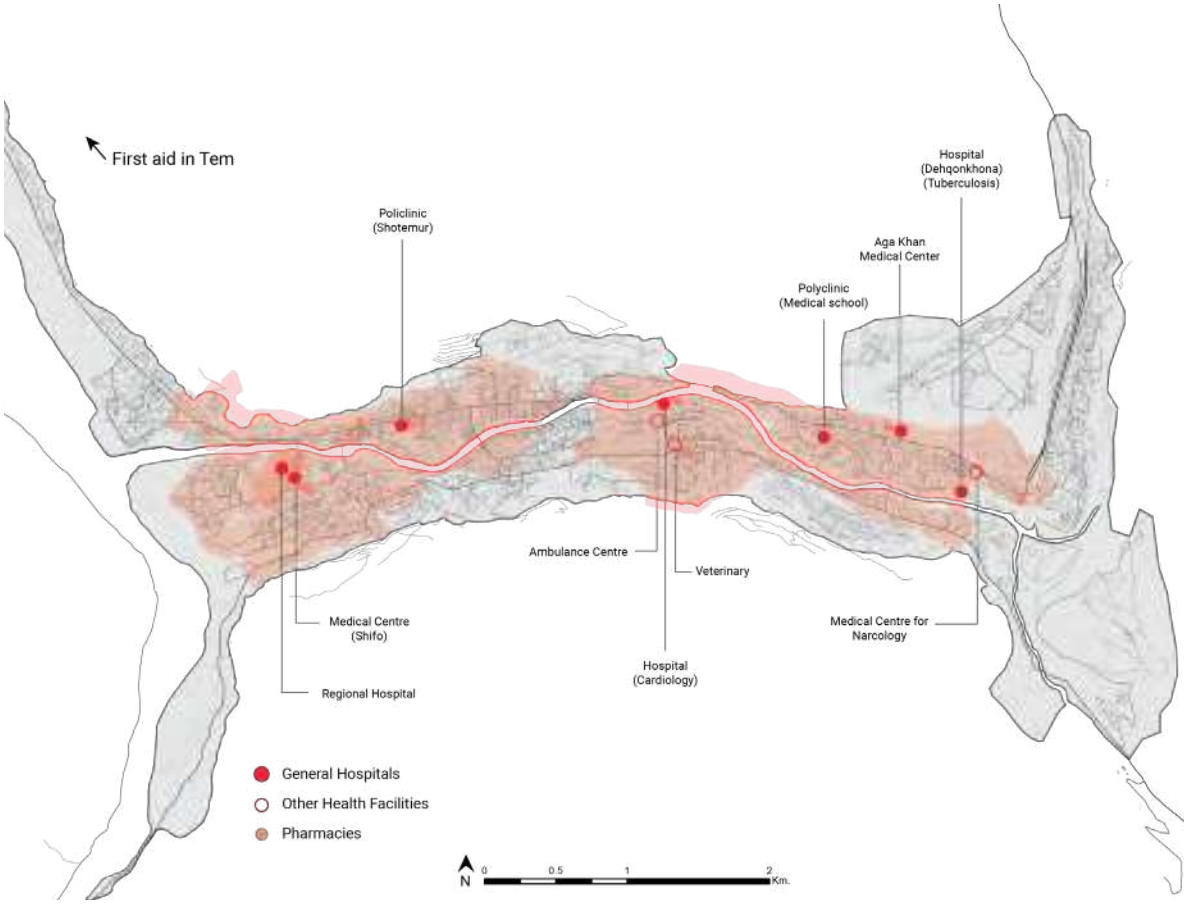


Fig 93. Location of health facilities in Khorog and the 15 minute walking service area of each facility

Heath Facilities – demand

This assessment highlights that most residents within each Mahalla have an option of only one medical centre. Health facilities are not equitably distributed according to population density, as three facilities experience a much lower demand than the other four. Hospital Campus 3 – Dehqonkhona, is close to other facilities and therefore, may only serve a small population. On the other hand, Policlinic Shotemur may experience the highest pressure from people living within its vicinity.

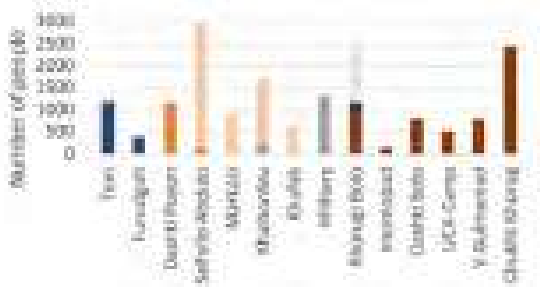


Fig 94. Number of people within the service area of each health centre, in each Mahalla in the North

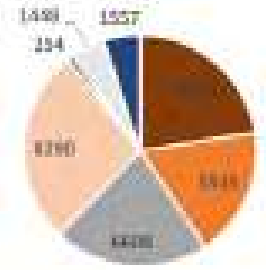


Fig 96. Number of people within the service area of each health center

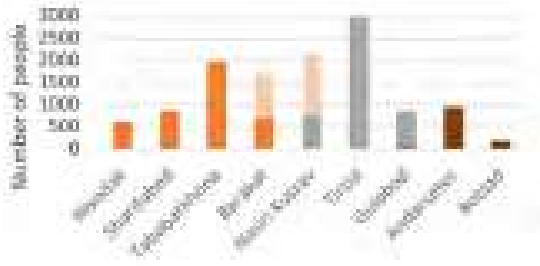


Fig 95. Number of people within the service area of each health center, in each Mahalla in the South

Health Facilities Assessment Summary

Increasing the compactness of the urban fabric and walkability around key public facilities and resources, can help to increase accessibility for more people over a wider area of the city. Accessibility measures such as decongesting main arteries into the city and strengthening the public transport system for people that do not live in the city may be considered a priority for the Regional Center Shifokhona.

Education Facilities – allocation and access

Education facilities are not only numerous but also of a high standard in Khorog, and therefore, like health facilities may be considered as an attractor for regional or international migration. The new UCA campus attracts international students, whereas the Khorog State University caters for local students. The Aga Khan funded education facilities and a number of adult training centres, support the highly educated population of Khorog.

A total of 5,120 households in Khorog are used to accommodate for limited age disaggregation in demographic data for the city. The education facilities included in this assessment are grouped into education levels of university, school, and kindergarten. All of these facilities are public, with the exception of the Aga Khan Lycee and a further facility which is referred to as 'Private School'. The facilities assessed are:

- Universities
  - Khorog State University
  - University of Central Asia
- Schools
  - School #1 - School #10
  - School in Tem
  - Presidential Lyceum
  - Lyceum of Aga Khan
  - Private School
- Kindergartens
  - Kindergarten #1 - Kindergarten #5

A number of Early Childhood Development Centers (ECDCs) are also located in the city. Lacking substantial data on these facilities has limited the assessment, however, they have been included in the maps to indicate their number and location.

Access level is not only defined by location, as is shown in this assessment. The UCA campus, for example, is spatially fragmented from the city by a steep gradient hill. Access to the campus is through a single entrance and one road, designed for car use. A wall separates the campus from neighbouring land uses as the land is private and access is controlled for students, faculty and visitors.

However, university facilities, particularly at UCA, are numerous and currently used by a small student body. Therefore, we have considered the use of university facilities by other communities within Khorog in the accessibility assessment. This may help to construct an image of how the existing university facilities may be used to service a higher potential capacity.

Education Facilities – access

40.9% of the population can access a university, 80.3% a school, and 62.2% a kindergarten within a 15 minute walking distance. This indicates a high walkable access to education within the city. Schools are the most prevalent and easily accessible, for which only 1.1% of the population of Khorog must travel over 2.5km.

Even though kindergartens are far more numerous in the city, it is of note that access to them within a 5 minute walk is low. This suggests that kindergartens are located in areas of lower population density. Accessibility to kindergartens is of particular importance to the community due to the role that they play in child development and adult employment.

The average walking distance to a university varies across the city, with a higher walking distance required in the East and West, and a lower walking distance in the city centre. Centrally located universities could provide high rates of accessibility if spatial limitations were eased or transport infrastructure improved.

Access to schools is high, with a low average walking distance required across the city apart with the exceptions of Gulobod, Andarsetez, Dashti Poyon and Gulmamad. Kindergartens follow a similar average to schools with the exception of the Northeast and in Andarsetez, where the access times are much higher. Considering the importance of kindergartens, populations in the Northwest and East may benefit from additional facilities.

Fig 97. Number of people who can access any education facility in 5, 10 and 15 minutes, and those who must travel further than 2.5km

Fig 98. Average time to access universities, schools and kindergartens by foot for each Mahalla in the North of the city

Fig 99. Average time to access universities, schools and kindergartens by foot for each Mahalla in the South of the city

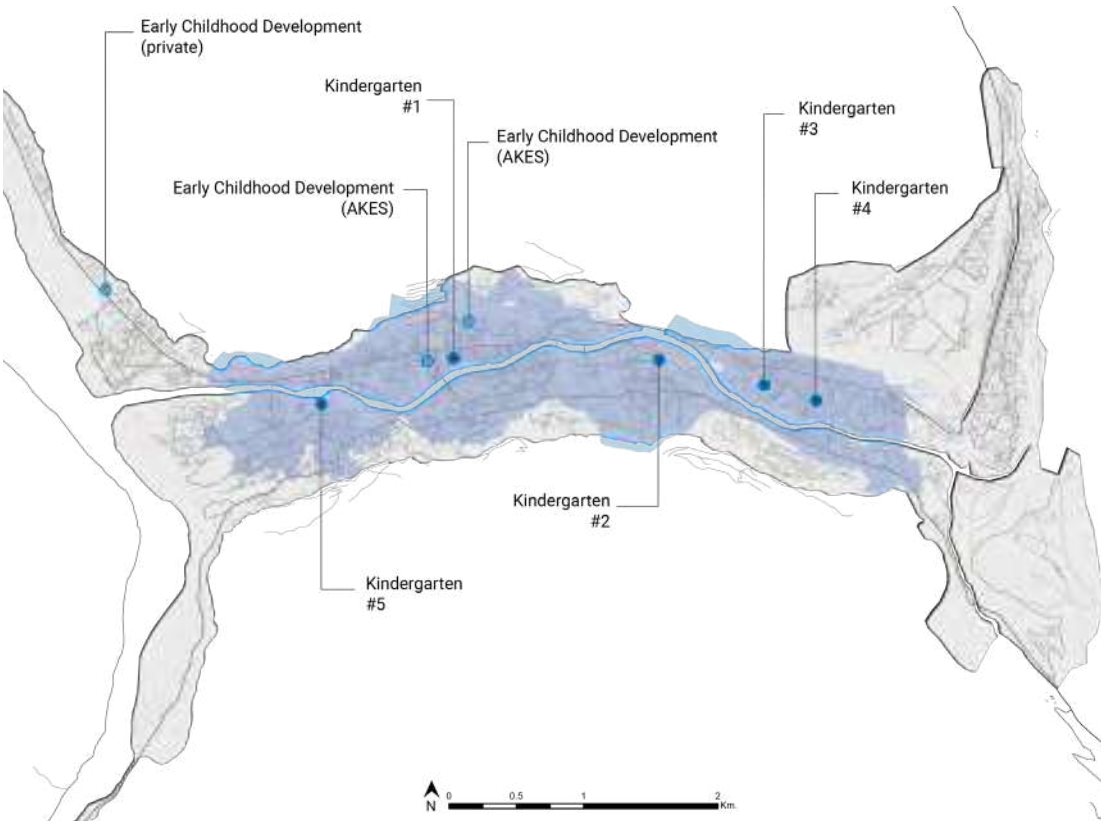


Fig 100. Location of kindergarten and Early Childhood Development centres in Khorog, and the area covered within a 15 minute walk of all facilities

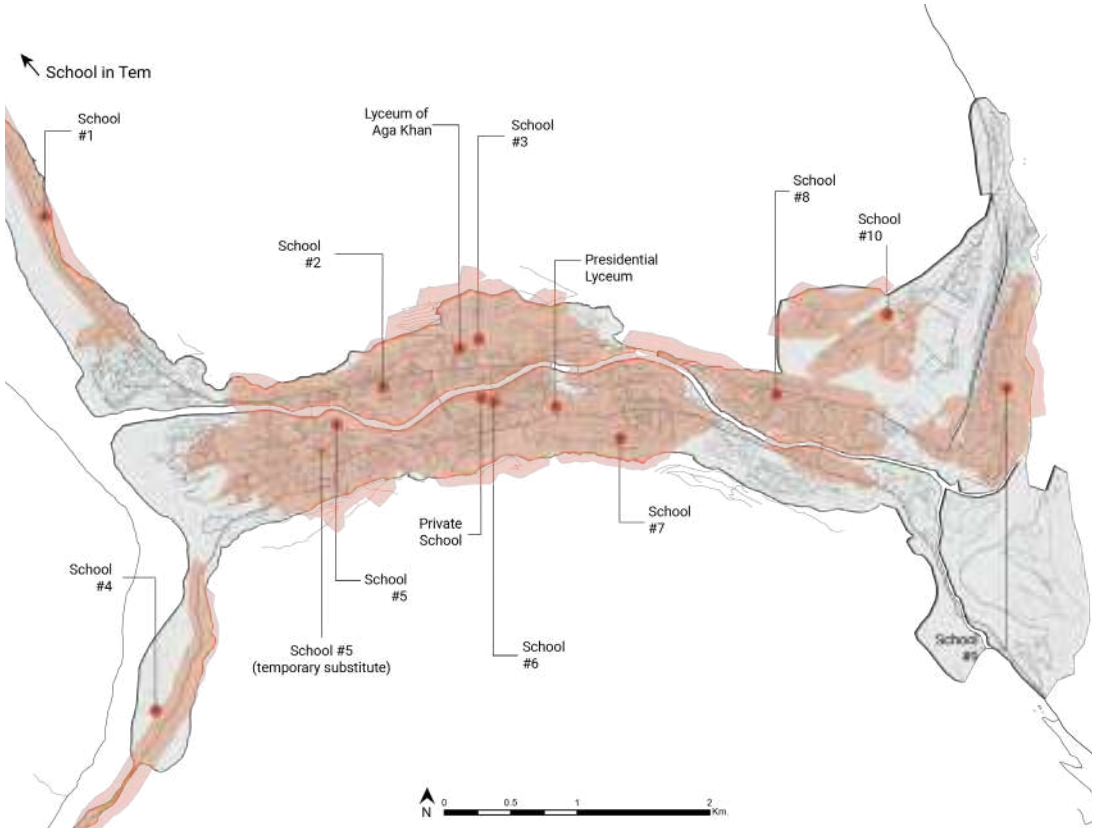


Fig 101. Location of Schools and Universities in Khorog, area covered within a 15 minute walk of all facilities

Education Facilities – demand

Demand is calculated by the population density in proximity to each education facility. This is identified by cross-referencing the distribution of facilities across the city with the number of people that would consider that facility as its closest. This can be assessed alongside the current capacity of the facility to identify areas requiring additional support or infrastructure and others that could accommodate a greater density of people in its vicinity.

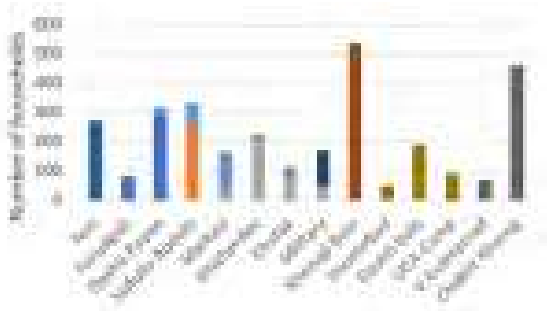


Fig 102. Number of households closest to each school by Mahalla in the North of the city

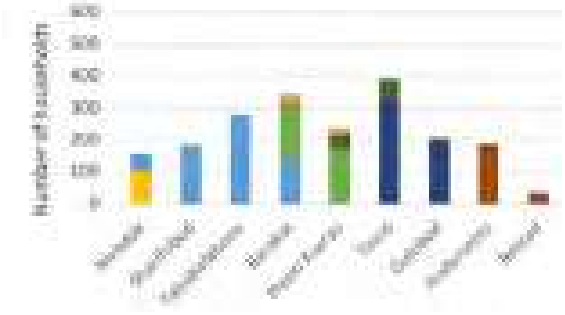


Fig 103. Number of households closest to each school by Mahalla in the South of the city

Schools in Khorog are generally strategically located to respond to the current population density. The number of households reliant on each school as a result of proximity is somewhat even, with the exception of schools 5 and 8 which experience the highest demand and the Private School for which demand is lower.

Increased development around the Presidential School would be accommodated for, as demand is split between this school and Schools 6 and 7. The Private School could accommodate an increased number of households within its vicinity according to current capacity and demand, however, its private ownership may present other challenges to accessibility.

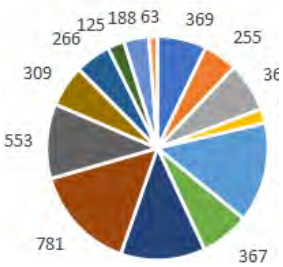


Fig 104. Number of households closest to each school in Khorog

Kindergarten capacity and intake in the city is more uneven. Kindergarten 3 is located in an area with multiple facilities and competes with Kindergarten 4 for intake. It is a small facility, which is appropriate for the level of demand created by the population desntiy of the area. Whereas the number of households reliant on each school ranges from 63 to 781, the number of households per kindergarten is much higher. Despite the low demand experienced by Kendergarten 3, the general distribution and intake suggests that additional kindergartens could be considered to reduce the high number of households reliant on each facility.

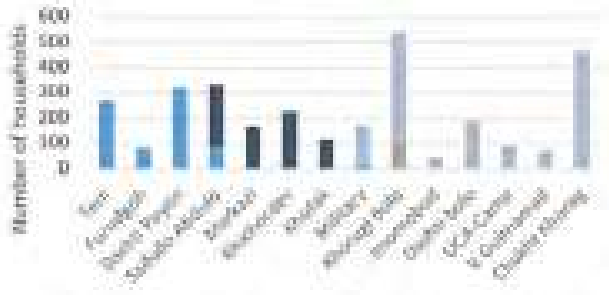


Fig 105. Number of households closest to each kindergarten by Mahalla in the North of the city

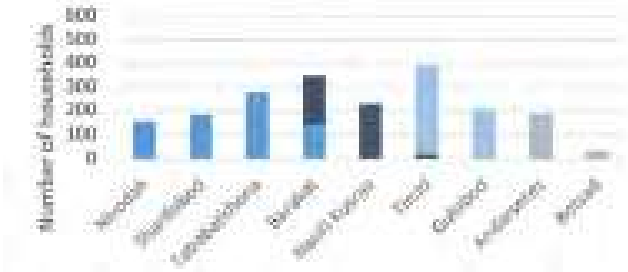


Fig 106. Number of households closest to each kindergarten by Mahalla in the South of the city

Education Facilities Assessment Summary

In conclusion, additional Kindergarten facilities, in particular in the East of the city, would reduce the pressure on existing facilities and improve accessibility. Despite the fact that School 4 and the Presidential Lycee experience low levels of demand, schools in the city are generally evenly distributed. Finally, the UCA campus could increase accessibility through spatial or transport-based mechanisms. Khorog State University is strategically located to serve a large population, meaning that additional funding or additions to this facility would constitute an efficient and effective way to improve access to higher education in the city.

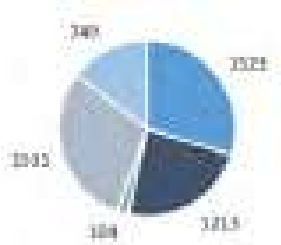


Fig 107. Number of households closest to each kindergarten in Khorog

Khorog City Center © UN-Habitat

Mobility, city permeability and morphology

The city's urban fabric presents various opportunities and challenges. Overall, the city's scale, layout and morphology allow inhabitants to walk throughout the city, promoting non-motorized transport. Such factors could also pave the way for alternative future modes of mobility, such as cycling. However, road quality is not consistent across the city, with a number of roads remaining unsurfaced. In addition, there are a number of steep slopes in the city that are not currently in formal use but are sometimes used as informal pedestrian routes. Formalising these routes and increasing planting in the sloped areas would help to increase the permeability of the city, strengthening the pedestrian network and rendering such steep gradient areas safe.

Despite the prevalence of pedestrian routes, reliance on motorized transport remains high. The majority of the city's transport infrastructure is oriented towards vehicles. The city's prioritization of vehicular travel is evident in the multiple fuel stations and truck depots located throughout the city.

As Khorog constitutes a primary route of travel through the region, traffic is comprised of users on routes ranging from from local to international scales. There is congestion in the town centre, though a new vehicular bridge is planned to re-direct traffic to the South. Legislative measures have also been put in place to reduce congestion and road blockages from unloading trucks by restricting longer-distance traffic from entering the city between 7am and 7pm.

The city's location along the river physically separates the neighbourhoods of the North and South. Limited bridges throughout the city exacerbate this separatation, limiting connectivity and further promoting the use of vehicles for convenience. Pedestrian bridges are limited to the West side of the city. The current load bearing capacity of the bridges was not predicted when they were built during Soviet times. Weight strain, and the frequency of earthquakes may quicken the damage of these bridges, the consequence of which would be problematic for the city, in particular in response to hazardous events.

Public Transport – allocation and access

Public transport in Khorog is lacks formal, coordinated planning but instead, is responsive to the needs of the local population. For example, mini-bus departure times are dependent on the vehicles reach capacity and bus stops are changeable as they are not formalised by structures. There are, however, five main bus routes that function somewhat regularly with a series of well frequented stops. Lines 4 and 5 are the most recent additions to the bus routes in the city. Approximately 400 minibuses are in operation, each with 7 seats.

The bus lines follow the main roads through the town and are therefore, evenly distributed. 21,105 people, or 69.2% of the population can access a bus route within a 5 minute walking distance. Areas shown in figure 110 such as Sharifobod, Chukht Khorog and Imomobod lack access to a bus route.

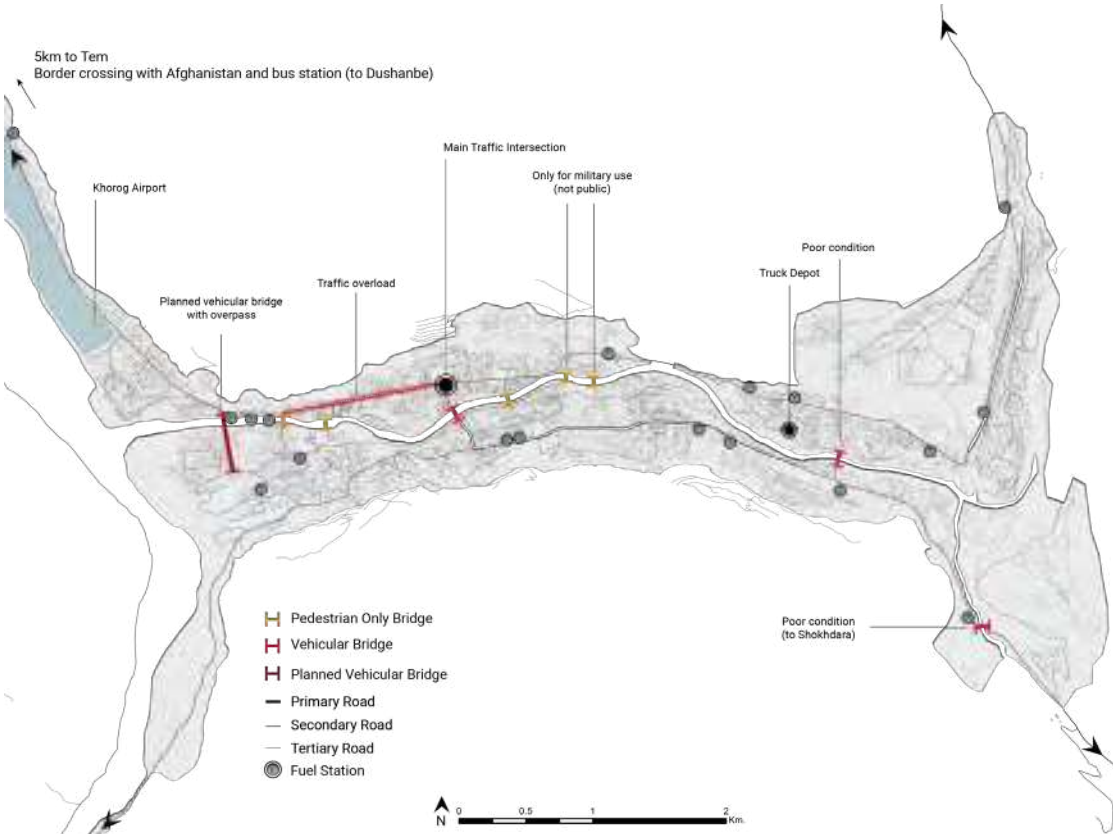


Fig 108. Mobility infrastructure in Khorog

Public Transport Assessment Summary

A number of measures can be taken to address congestion in the city centre and improve the transport network to reduce reliance on private vehicular use. Measures could include infrastructure to decongest the central bus stop area, such as mini-bus parking lots and formal shelters could be compliemented by regularisation of bus departure times which would further aid decongestion and provide a more reliable public transport system.

More formalised bus stops can strengthen the existing transport network. New stops should extend bus routes into areas that are currently lacking access, such as Sharifobod, Chukht Khorog and Imomobod. Rather than mainly focussing transport routes on connections between the peripheries and the city centre, a densely interlinked and integrated bus network would provide a more efficient and sustainable alternative to private vehicular mobility.

Additional bus stops will aid in reducing traffic around the central bus station and create opportunities for the development of alternative economic nodes in the city, for example along the Southern axis. Concentration of economic nodes alongside the existing market structure in the central area could benefit from proximity to the regular flow of local and regional traffic. Safety related infrastructure could also improve the usage levels of public transport. Mitigation strategies for hazards along transport routes should be considered a priority to protect economic and mobility infrastructures.

Fig 109. The number of people that can access each bus route in Khorog within a 5 minute walk

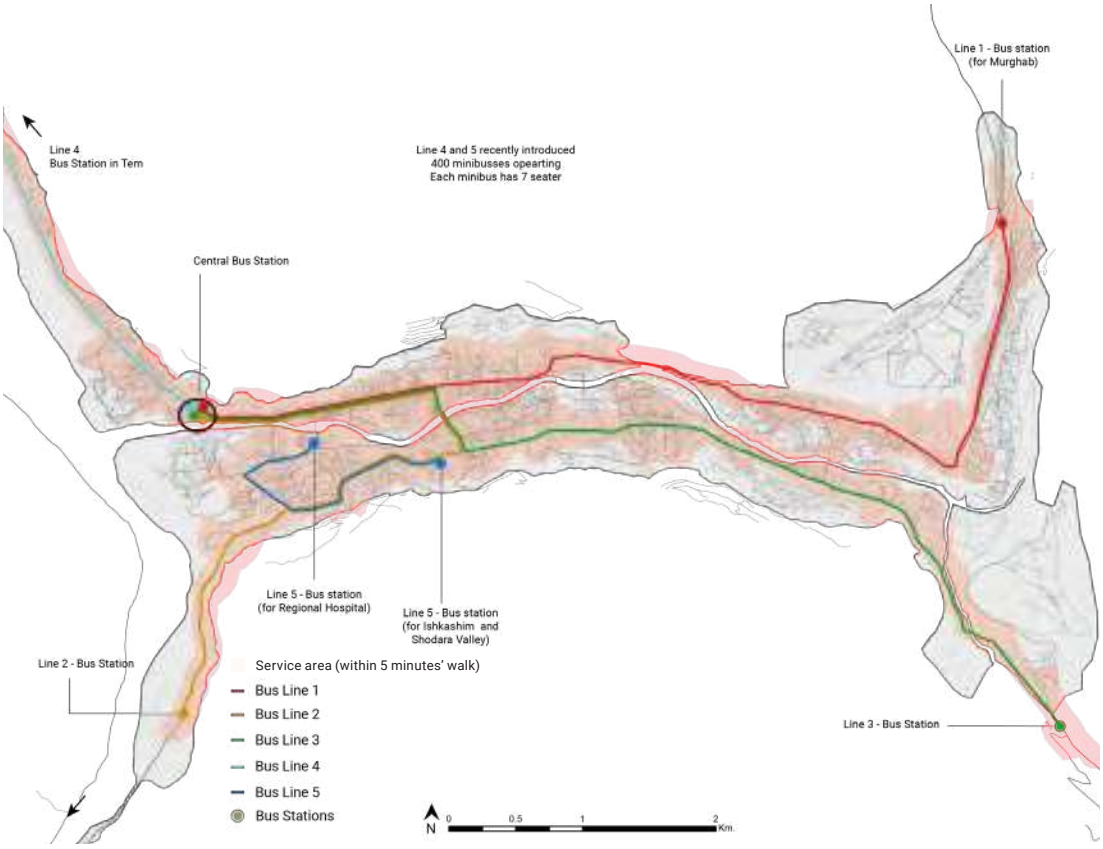


Fig 110. Bus routes in Khorog and 5 minute walking distance service area

Public Space – allocation and access

Public spaces are a vital resource for the population of Khorog and therefore, must be accessible to all community groups and managed accordingly. Although Khorog is generally green and has a number of under-used land parcels, dedicated public, open and green spaces are not as numerous.

The existing spaces include:

- Green public spaces of Victory Park, City Park, Botanical Gardens
- Khukumat Square
- Sports Facility (17)

The City Park is the most recent public space development by the AKDN. It comprises a number of permanent programatic activities and facilities, such as a theatre, tourist center, and cafe. It is closed at night and is well maintained. The Botanical Garden is a much larger public space with less consistent programing.

Sports facilities vary from indoor spaces, formalized outdoor spaces and school sports fields that are also used publicly. Many sports facilities have been built recently by AKDN and are used regularly by the community. Sports facilities are additionally used informally as gathering spaces for all ages and are therefore, considered as important as other public spaces in Khorog.

The following public space assessment uses the same assessment methodology as the other thematic areas and therefore, is based on allocation, access and demand. No data regarding the status of ownership and management as either public or private, nor of fees or the specific programing of each space was available for this assessment. Therefore, the public space categories are based on use or typology (for example sports facility or green space).

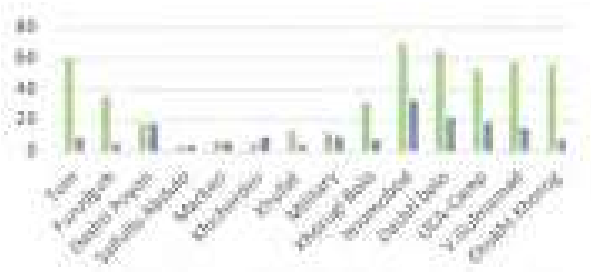


Fig 111. Average time to access green spaces and sports facilities by foot for each Mahalla in the North

Fig 112. Average time to access green spaces and sports facilities by foot for each Mahalla in the South

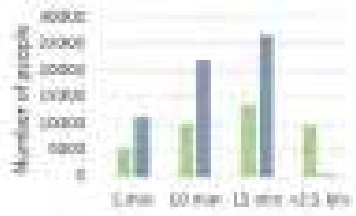


Fig 113. Number of people who can access a sports facility and open public space in 5, 10 and 15-minutes' walk, and those who must travel more than 2.5km

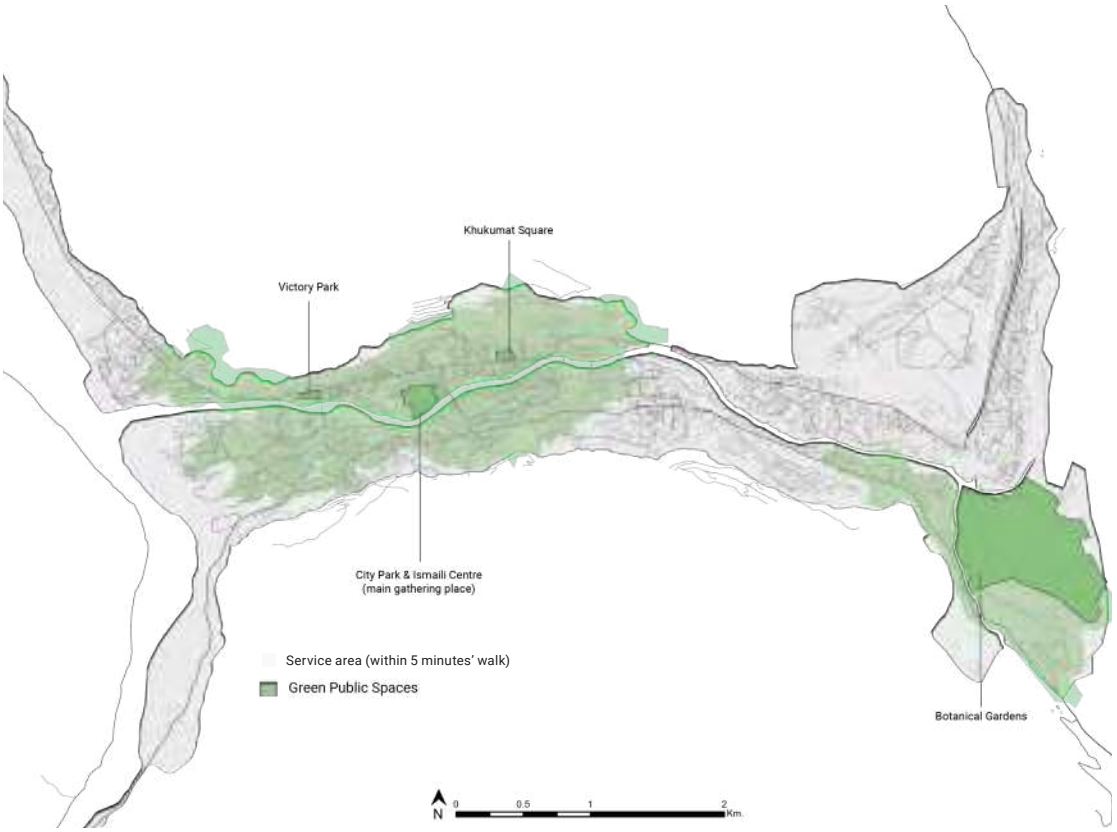


Fig 114. Location of green and open public spaces in Khorog, and the 15 minute walking distance covered by all public spaces

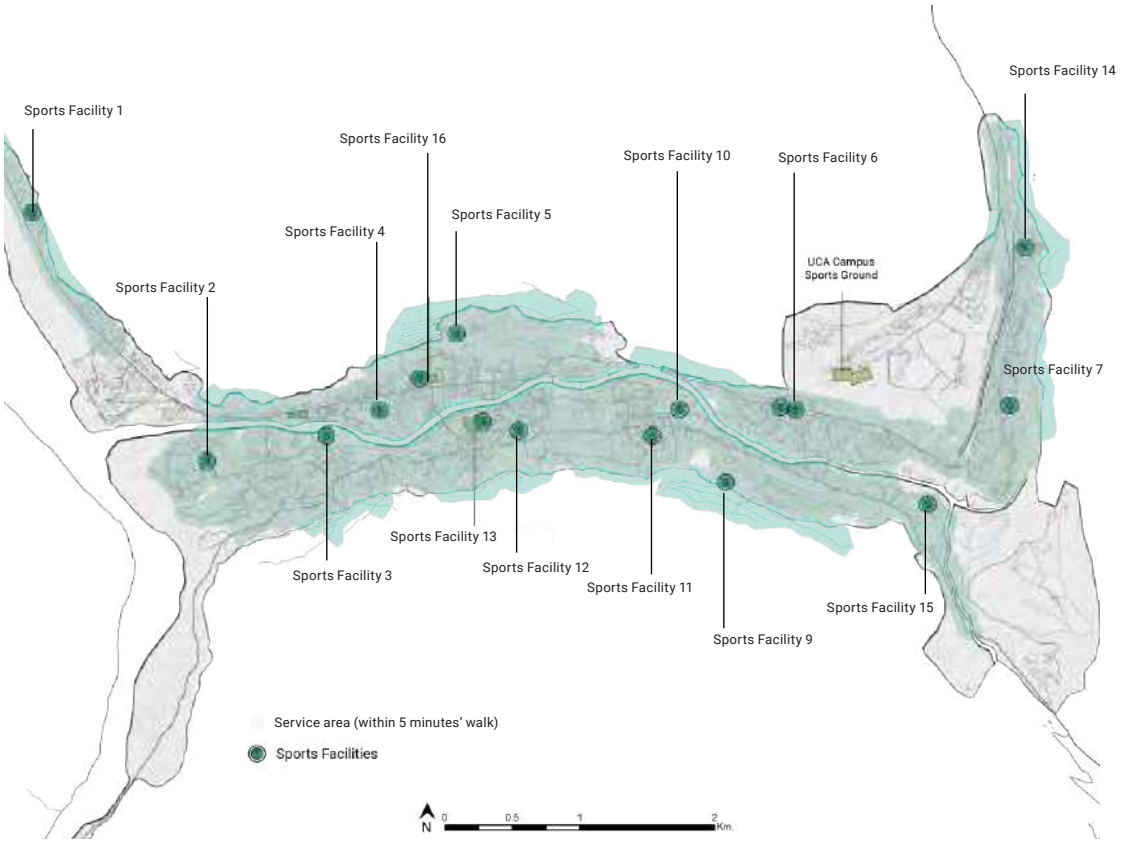


Fig 115. Location of sports facilities in Khorog, and the 15 minute walking distance covered by sports facilities

UN-Habitat recommends that a minimum of 10-15% of the total urban area is allocated to public space (not including streets and sidewalks). The total urban extent of the city of Khorog is 877 ha, with a total area of public space amounting to 83.2 ha. This amounts to a public space proportion of 9.5%, which is not far below the recommended average.

The minimum recommended area of public space per capita is 9 sqm. The total number of people in Khorog is 30,500. Calculating the per capita public space allocation for this number using only officially allocated space (excluding streets, sidewalks and unused land) indicates a ratio of 3.9 m2.

There is a general trend that communities in the West and Eastern peripheries of Khorog must travel further to access a public space, which suggests that a public space strategy is needed to extend the network to the city periphery. The highest average walking distance to a green space is in Imomobod, where the time required is 70 minutes. An additional five Mahalla require average walking distances of between 50 and 70 minutes.

Almost half of Khorog's population (44.5 %) can access an open public space within a 15-minute walk (a total of 13,558 people). This degree of accessibility is higher for sports facilities (87.6%) as they are higher in number. 10,392 people must travel further than 2.5km to access a public space (of any typology). The Botanical Gardens services the lowest number of people within a 5, 10 and 15-minute walk. A total of 54 people have access to this space within a 15-minute walk. The public spaces servicing the highest number of people with access within 15 minutes are sports facility 13 and the City Park.

Public Space – capacity (population vicinity)

A diverse number of sports facilities are accessible to communities within each Mahalla. This may indicate a greater diversity of use as well as high rates of accessibility. Sports facility 13 in Nosiri Khusrav is the most strategically located and may require additional maintenance. If the current use of the facility is low, it may be pertinent to reduce other boundaries to accessibility (such as cost of access, programing or quality of facilities).

Public Space Assessment Summary

Generally this analysis suggests that further measures to improve accessibility in a way thay is inclusive of vulnerable groups (street network, bridges, intersections and permeability) on the East and West of the city could be implemented to increase use of existing green spaces such as the Botanical Gardens. Additional green spaces in Tem, Furudgoh, Nivodak, Tirchid, Gulobod and the Northeastern area could improve access to this resource whilst performing the dual function of a wider risk adaptation strategy that uses natural solutions to hazard mitigation, thereby, improving resilience. Increasing the diversity of sports facilities may also improve the network of public spaces overall, considering the important role sports facilities play in the city. The average time to access a sports facility in Khorog is relatively low, with the exception of Imomobod. Other accessibility indicators, such as cost, capacity, safety and inclusivity may be useful to expand this study more comprehensively.

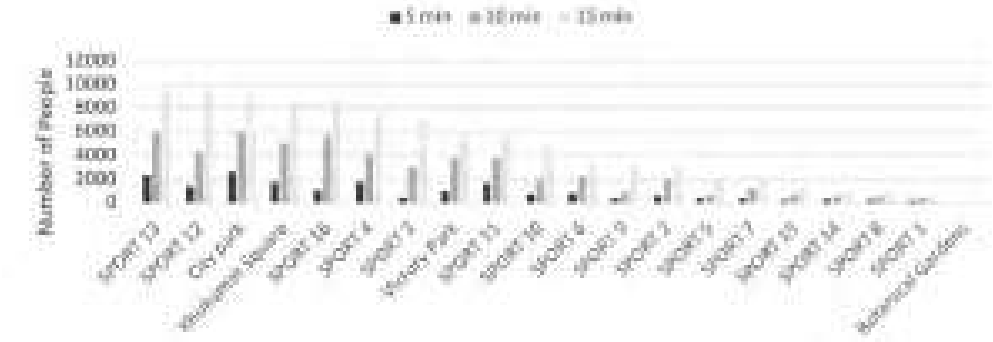


Fig 116. Number of people who can access all public spaces in 5, 10 and 15-minutes' walk

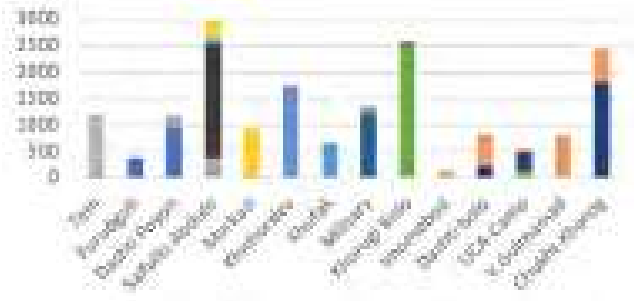


Fig 117. The number of people closest to sports facilitiesNorth of the city

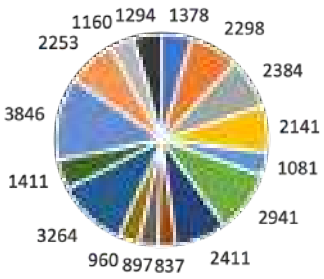


Fig 119. Number of people closest to sports facilities by Mahalla in the South of the city

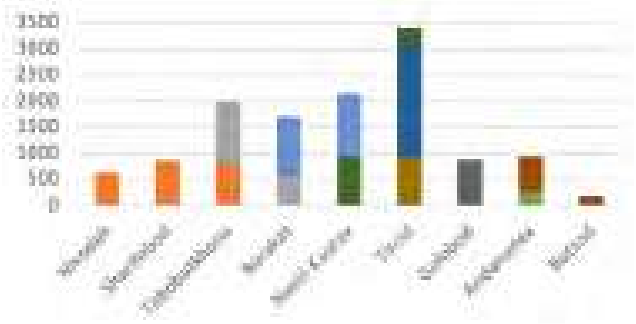


Fig 118. Number of people closest to sports facilities by Mahalla in the North of the city

Under-used Land

There are various pockets of under-used land throughout Khorog, revealing the fragmented nature and low density of the urban fabric. Under-used land has been categorised as either brown-field or vacant. Brown-field sites include previous industrial areas that are either unused or only partially used. Vacant lots include areas of the city that are void of construction due to hazards, slopes or vegetation coverage.

A cluster of both categories of unused land were identified In the West side of the city, South of the river, adjacent to the location of a planned bridge crossing. The location of this cluster along the river, in close proximity to the city centre and residential areas, makes it suitable for urban development. Programs and uses would require further assessment to ensure that any development is resilient to potential hazards.

Soviet industrial properties are currently used by local businesses and for private housing. Their location, current uses and the limited availability of other land demonstrate their suitability for redevelopment/ repurposing. Programs and uses would require further assessment to ensure that any development is resilient to potential hazards.

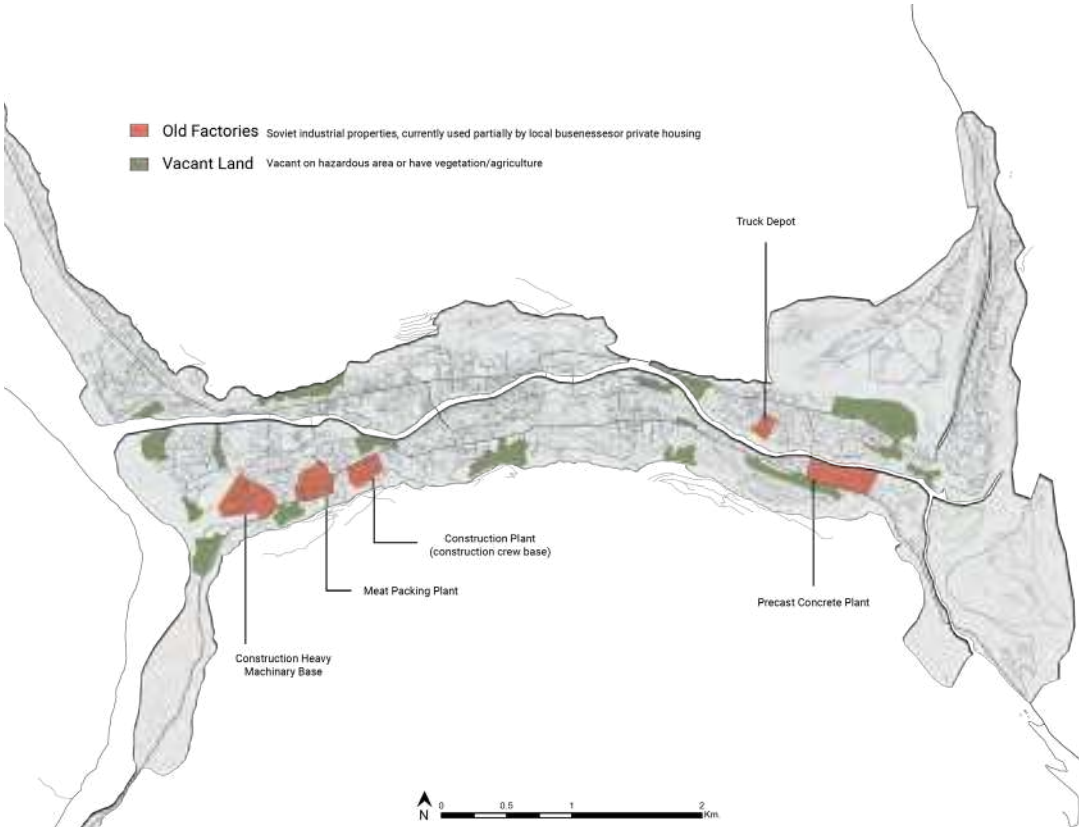


Fig 120. Under-used land in Khorog

Public Transport Assessment Summary

A number of measures can be taken to address congestion in the city centre and improve the transport network to reduce reliance on private vehicular use. Measures could include infrastructure to decongest the central bus stop area, such as mini-bus parking lots and formal shelters could be compliemented by regularisation of bus departure times which would further aid decongestion and provide a more reliable public transport system.

More formalised bus stops can strengthen the existing transport network. New stops should extend bus routes into areas that are currently lacking access, such as Sharifobod, Chukht Khorog and Imomobod. Rather than mainly focussing transport routes on connections between the peripheries and the city centre, a densely interlinked and integrated bus network would provide a more efficient and sustainable alternative to private vehicular mobility.

Additional bus stops will aid in reducing traffic around the central bus station and create opportunities for the development of alternative economic nodes in the city,

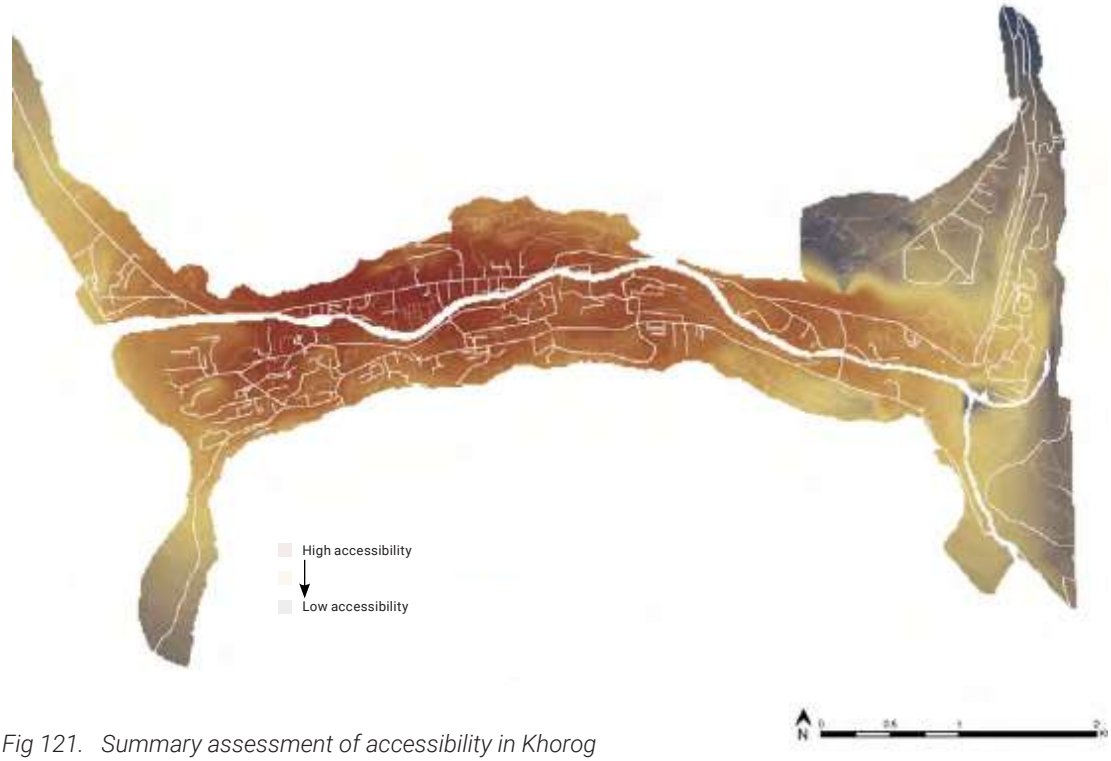


Fig 121. Summary assessment of accessibility in Khorog

View from the hydro-power plant in Eastern Khorog © UN-Habitat

3

DIAGNOSIS OUTCOMES

The assessments contained in this report are designed to build on the findings of the City Profile Part 1, further detailing resiliency levels and challenges which are thematically separated into four categories; institutional, environmental, socio-economic, and infrastructural. The assessments have also provided indications as to how further challenges may arise or existing challenges may worsen as the city grows. The following provides an integrated, spatial consolidation of the analysis. This will be elaborated on further in the City Profile Part 3: Recommendations Report.

Firstly, it has been identified that in various parts of the city, both people and the urban fabirc are at risk from hazards. Figure 122 highlights areas of the city that fall within the hazard zone. Depending on the intensity, type and frequency of the hazards that occur in each of these respective areas, urban expansion limitation, mitigation, conservation and/or disaster response coordination strategies will likely be necessary.

Areas such as Sharifobod, the North of Saifullo Abdulo, Khufak, North Kichordev, Northwest Khorugi Bolo, Imomobod, Northern Valdosh Gulmamad and Chukht-Khorog, and Western Gulobod, have all been identified as those with either a high population or land area at risk, or as experiencing multiple hazards at a frequent rate or high intensity.

Considering the population density distribution against the areas affected by natural hazards renders evident that the hazard area forms a natural boundary to the urban extension. **This demonstrates the risk to existing structures in these border areas and that city expansion in these areas will exacerbate existing threats. However, the analysis also reveals areas of low population density in low-risk areas that can be densified.**

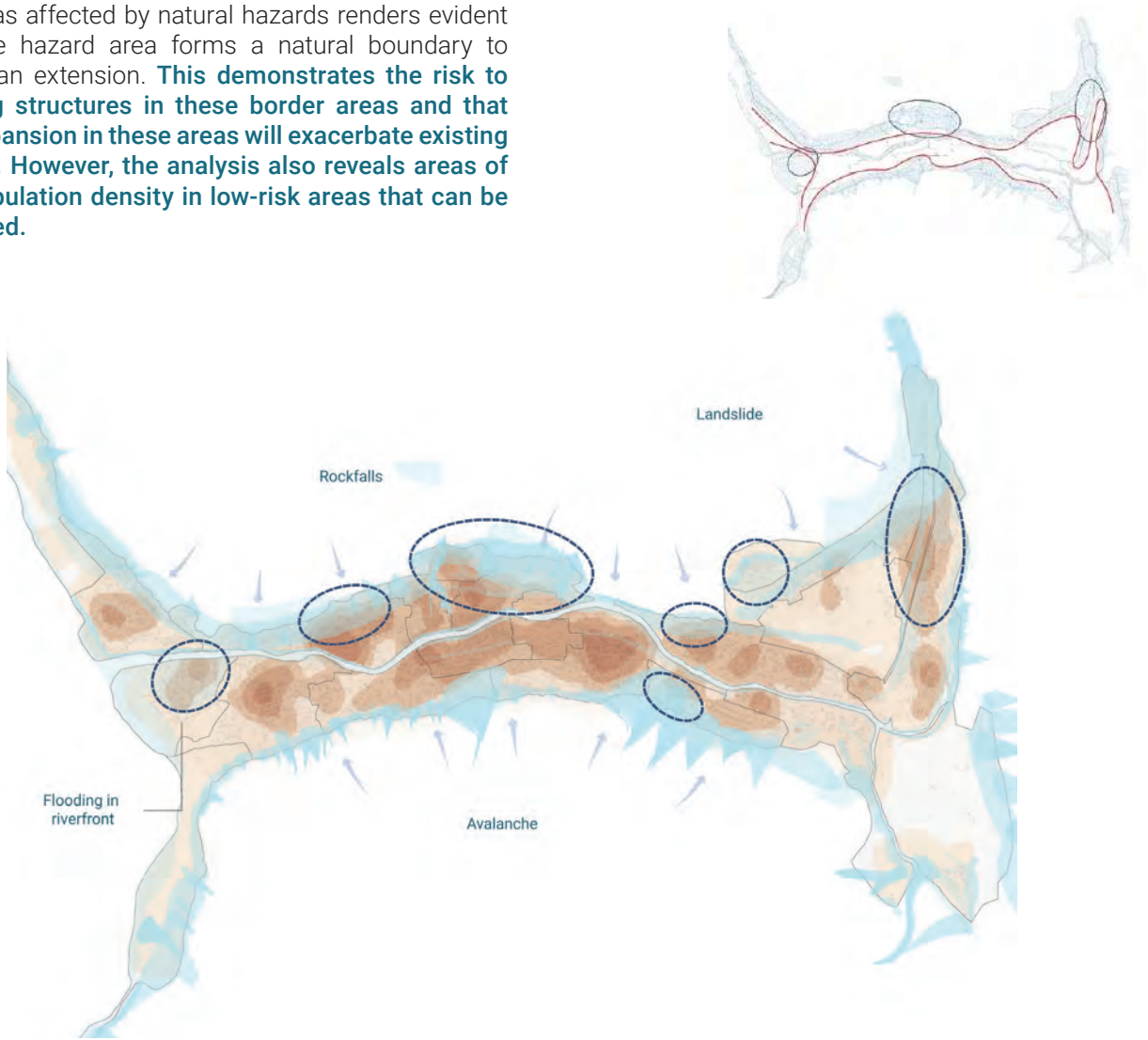


Fig 122. Enchroachment into hazardous land

The second spatial consolidation of the analyses highlights key sites of under-used or vacant land within the urban boundary of the city. These land parcels are vital to a future growth strategy, which will be necessary to guide development in a more compact and efficient way, that uses the land available and complements existing service networks.

Figure 123 overlays the population density distribution, land at risk from hazards, and under-used plots of land. The average population density in the city is low (a maximum of 124 p/ha) in comparison to the UN-Habitat recommended average density of 150 pp/ha to ensure a compact, integrated and connected neighborhood.[04] Rapid, unplanned growth can lead to sprawl and excess costs associated with extending and maintaining city networks such as utilities, transport and economic nodes. Densification can make more sustainable and efficient use of existing networks, with less costly maintenance and capacity improvement measures.

Identifying under-used plots of land has helped to establish the city's potential for densification. Overlaying this with the hazard impact areas has further allowed for the identification of priority clusters of under-used plots that are least at risk.

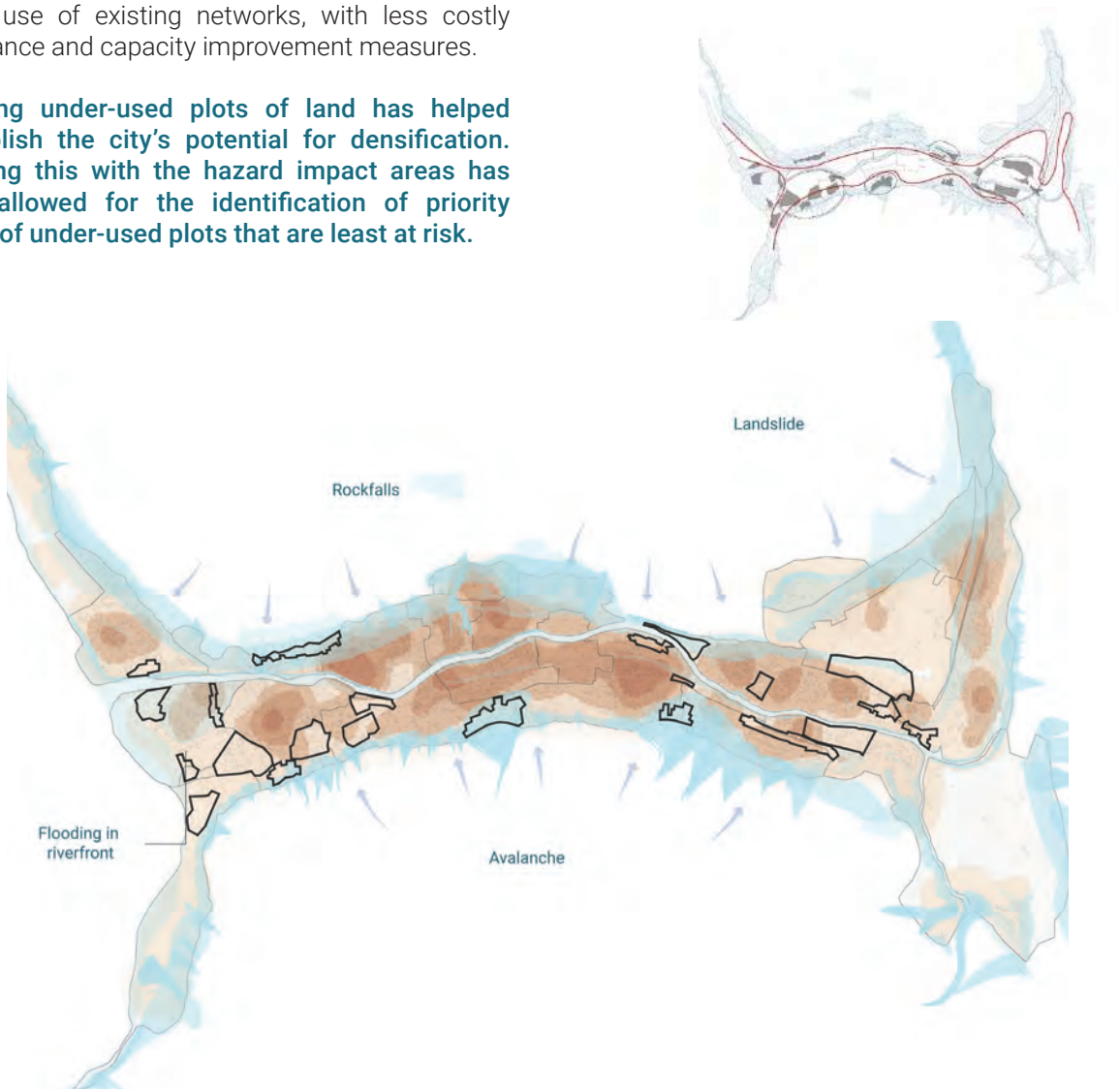


Fig 123. Under used land in hazardous areas

The third spatial consolidation integrates the land use and morphology of the city to demonstrate the extent of urban fragmentation. Key factors that have led to fragmentation in Khorog are the placement of large, mono-functional clusters, the steep gradients in the city topography, and the main river and water channels that run through the city. Areas that are fragmented by steep gradient slopes include Khufak and Khichordev, Imomobod, the UCA Campus and Botsad, the Northwest corner of Andarsitez, and Valdosh Gulmamad. Many of these areas contain multiple factors that cause fragementation.

Due to the limited land availability caused by hazard risk and projected population growth, these elements can exacerbate existing challenges. The limited road and bridge access in certain areas of the city is one such element that leads to low levels of integration. If not identified and addressed, fragmentation can further limit accessibility, increase car dependency, obstruct consolidation and growth of economic nodes, disperse mobility and utilities networks, and interrupt public space networks.

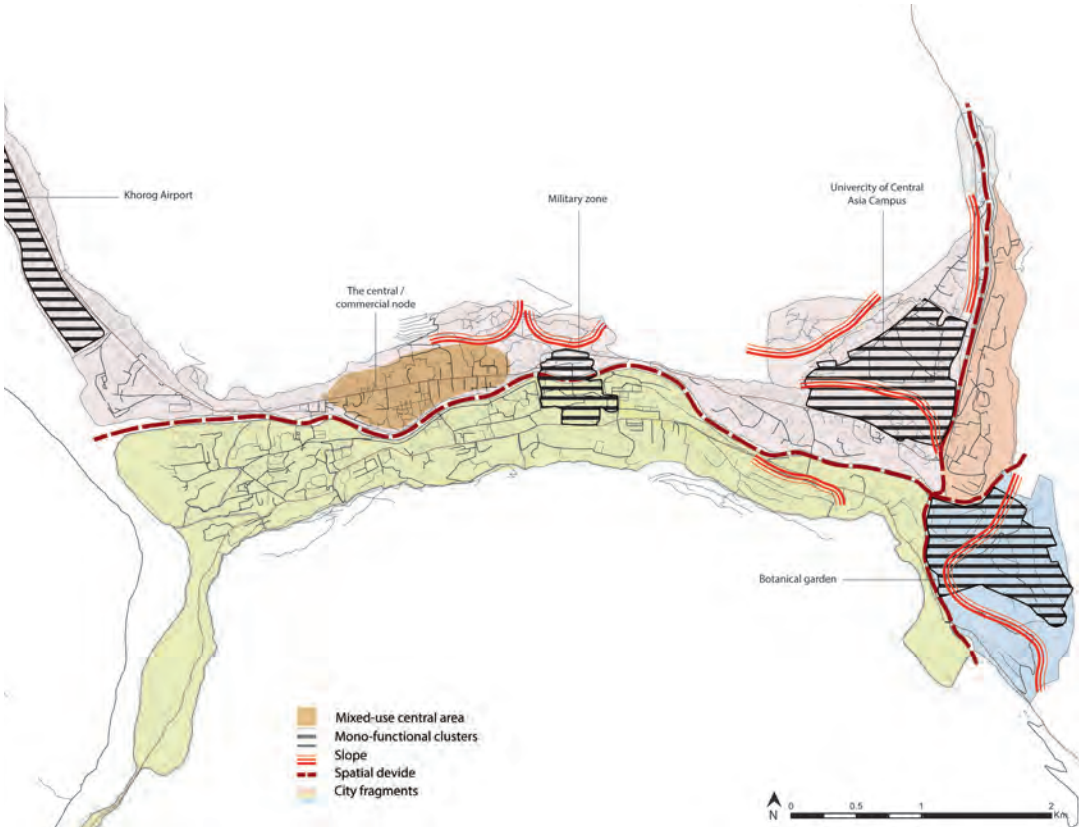


Fig 124. Fragmented Urban Fabric

Building on the fragmentation assessment in Khorog, the fourth consolidated analysis highlights challenges in the city's connectivity. The lack of pedestrian linkages, in particular of foot bridges means that certain areas of the city are difficult to access for pedestrians and car dependency is high, leading to congestion in the city center. The road infrastructure in some cases disregards pedestrian and cycling routes.

Figure 133 highlights areas of low permeability in the city, which, combined with city fragmentation factors, can isolate neighborhoods. This impacts both their ability to adapt and react to natural hazards, and their accessibility to utilities, health, education, public facilities and economic nodes.

There are no pedestrian crossings in the Eastern side of the city which limits movement between these neighborhoods and their access to facilities in the city center. This is particularly important to address in the area around the Botanical Garden to shorten travel distances for communities in these areas. The accessibility assessment also indicated that the UCA campus and demand levels could provide a high level of access, however, the lack of pedestrian linkages to nearby neighborhoods as well as other non-spatial limitations, limits its integration with the city.

High traffic loads in the city center have been mitigated by limiting truck access during the day, however, additional measures are necessary to reduce existing congestion and accommodate the city's future growth. A planned bridge in the West of the city may re-direct traffic, however, additional infrastructure to accommodate traffic along the Southern axis route has not been planned.

The diagnosis suggests that bus lines are accessible across the majority of the city, however some areas still lack access. Increasing formalized bus stops, particularly in areas that currently lack access, as well as regularising departure times may improve the reliability of the service, its safety, and thereby, reduce car dependency.

The public spaces in the city are large but dispersed and the lack of an integrated public space network reduces the city's walkability. A pedestrian network can be further promoted by enhancing and connecting pocket parks.

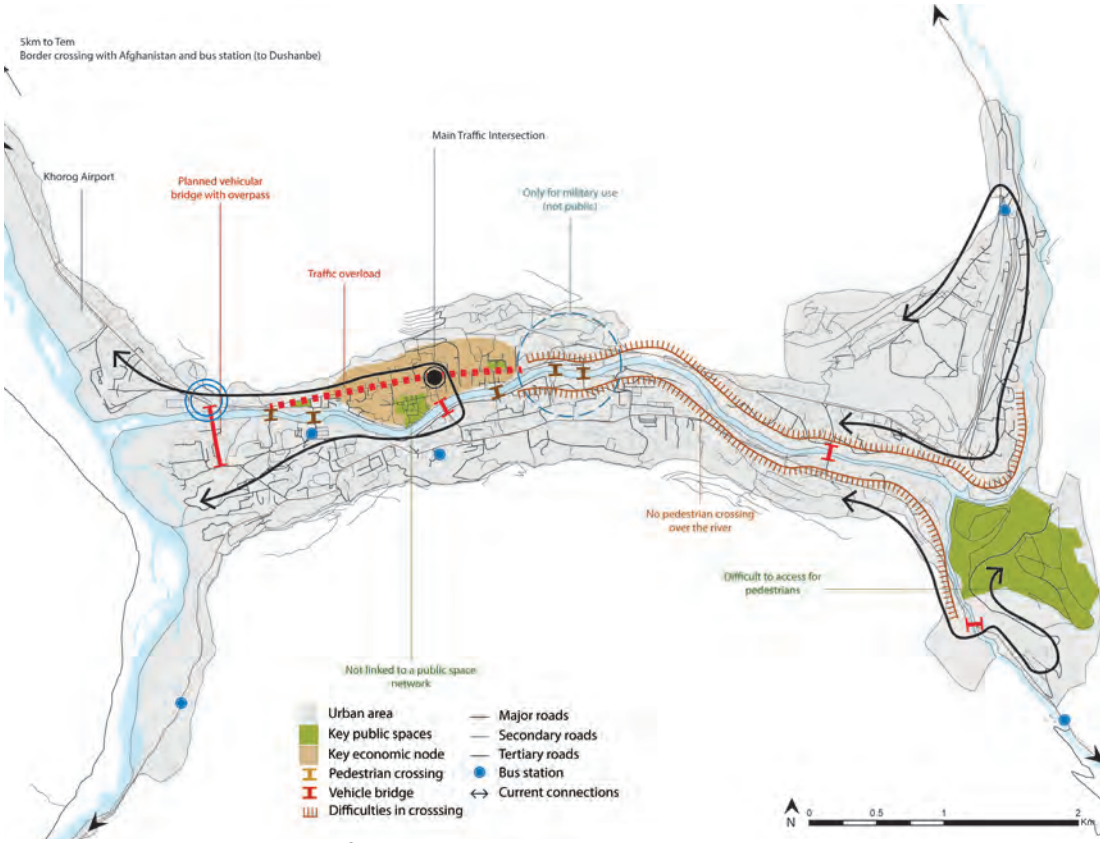


Fig 125. Car Dependency and Lack of Pedestrian Linkages

The fifth consolidation of analyses demonstrates that the current water and sewerage infrastructure is insufficient for the population.

Figure 134 identifies a large area of the city that requires increased water and sewerage supply, as well as areas that require more immediate mitigation measures to avoid septic tank pollution of ground water. This map overlays the population density distribution of the city with areas lacking access to these utilities to highlight priority areas.

It also helps to highlight the interrelated nature of utilities provision. For example, water channels that provide access to water may also increase the risk of ground water flooding. This further impacts areas that lack access to the sewerage network and rely on septic tanks. Improvements to the existing basic service infrastructure may improve access in certain areas whilst negatively impacting informal water access elsewhere if not properly accounted for.

Although works are being undertaken make the electricity network more efficient for the current population, and the current network covers the majority of the city, additional measures such as the provision of alternative energy sources and storage are necessary to avoid over-reliance on the water flow implicit in hydro-power and ensure more efficient usage of the existing network.

An integrated, city-wide approach is therefore necessary to accommodate the whole city with both household water supply and irrigation, sewerage networks to avoid water pollution, and consistent year-round electricity provision. Upgrading the quality of water pipes and channels to reduce leaks, landfill sites to reduce pollution of nearby water sources, and policies to reduce plastic use and introduce recycling are also identified as measures required to improve the infrastructural functions of the city.

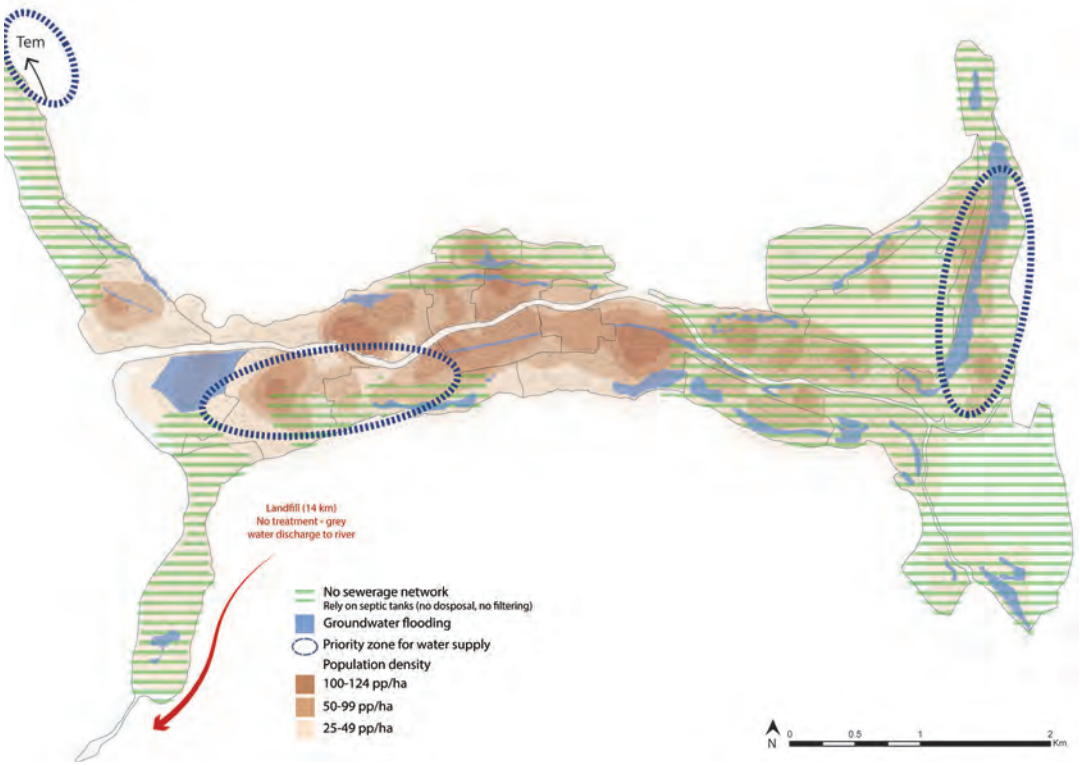


Fig 126. Insufficient Utility Infrastructure

Finally, the distribution and provision of public facilities does not reflect the existing population density in the city, meaning that certain areas lack access to fundamental public services. A number of facilities are located within hazard zones, whereas others have capacity to be used as emergency facilities in cases of a natural disaster. Certain facilities experience higher demand but may not have the appropriate capacity, which will be exacerbated with population increase. Tem has limited access to a health facility, Nivodak is without a sports facility, and kindergartens are lacking in the East of the city.

Figure 135 highlights areas that are lacking access of public facilities and those impacted by hazard zones. The hazard assessment disaggregated hazard risks by frequency and type, providing data that can be used to ensure these social facilities are better prepared.

Diagnosis Outcomes Summary

The challenges identified in the City Profile Part 1 have helped to inform the approach to the diagnosis assessments undertaken in this report. The diagnosis is designed to further the understanding of challenges faced by the city, providing more detail and spatially specific outcomes which have been summarised above. These, considered alongside other assessments including the legislative assessment, the capacity assessment, the masterplan assessment (in Annex 1), and the outcomes from a series of community engagement activities, form the basis to the responses, approaches and recommendations that are outlined in the City Profile Part 3 report.

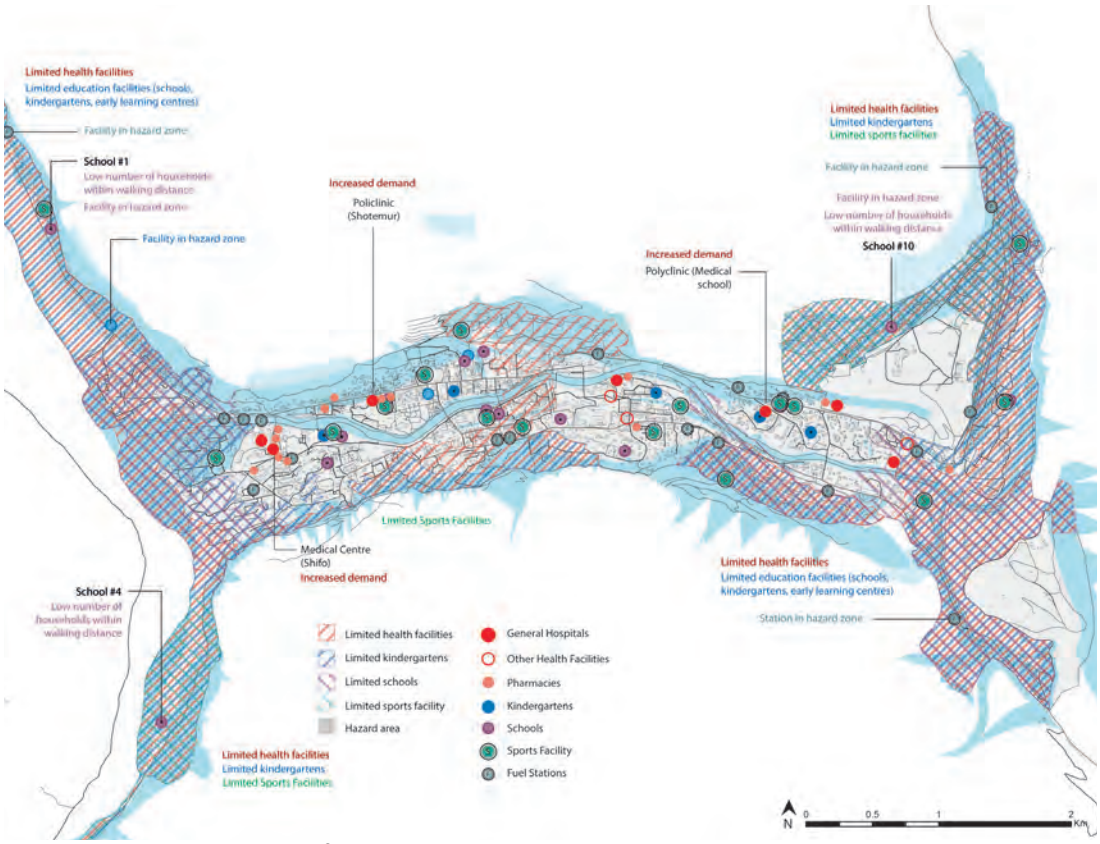


Fig 127. Unequitable Distribution of Public Facilities

Pedestrian bridge in Khorog City Center © UN-Habitat

4

ANNEX

4.1. MASTERPLAN ASSESSMENT TOOL

A master plan assessment is useful to identify how existing plans for the city of Khorog, can relate to or support the current work undertaken by UN-Habitat in partnership with the Aga Khan Agency for Habitat (AKAH), and how a spatial strategy might build upon the lessons learned from those of the past.

The method of evaluation uses the 'Planning Assessment Tool' (PAT). This tool guides a comprehensive assessment of existing plans, highlights gaps and limitations and provides a source of learning for stakeholders on the necessary building blocks to form an evidence-based, participatory and sustainable master planning process.

The PAT builds awareness on the key components of a master plan and can be re-used as a process of self-evaluation when in the process of creating a master plan, or evaluation of other existing or future plans. This component can therefore, be re-visited at any point of the planning process.

Masterplan Assessment Tool in context

As a City Profile analysis of Khorog was completed prior to this master plan assessment, to build knowledge on data availability, the legislative context, and the existing environmental, socio-economic, and infrastructural challenges were drawn upon to make informed assessments in the use of this tool.

The planning processes in Khorog include a 2010 'General Plan', created by Giprostroy (known as 'OJSC Shahrofar design institute') which includes general zoning with a planning focus on the city centre.

A 'Strategic City Plan', which has been elaborated into a 'Master Plan' was developed by a sub-agency of the Aga Khan Development Network, the Aga Khan Trust for Culture (AKTC), in collaboration with an independent architecture firm, **Mcfarlane Green Biggar Architecture + Design (MGB)**. Despite the existence of these plans, there is limited evidence to show that they have been implemented or adhered to at the city scale to guide development or impact spatial strategies and planned infrastructure.

Some alignment with representatives from Giprostroy and MGB took place as part of an MGB mission workshop in 2010, where sites, priority areas and principles were agreed upon. However, there remains a somewhat limited understanding of the process behind either the 'General Plan' or the AKTC plan for Khorog and access has been granted only to the AKTC and MGB planning documents and reports. This is considered a limitation to this planning assessment and must be taken into account.

Therefore, this assessment uses the AKTC plans as an example by which to present the Plan Assessment Tool (PAT). Not only does this assessment identify gaps in the existing masterplan but it also informs the project process for the production of the 'Integrated Spatial Plan for Environmental and Socio-Economic Resilience', through the project analysis, diagnosis and recommendations, and in the assessment of capacity gaps, participatory processes, and necessary training. In light of the low implementation rates of previous masterplan exercises, this assessment is vital to ensure a more practical approach moving forward.

Documents Assessed

The following highlights the specific documents that were used as part of the PAT. This chapter gives a brief overview of what each document contained to provide a basis of understanding behind the assessment that follows.

Fig 128. Dates and documents reviewed

31.03.10 AKTC + MGB Strategic City Plan

This document was created by AKTC in collaboration with **Mcfarlane Green Biggar Architecture + Design** and Ibex In-Sites Community and Project Planning. **It** aims to provide a resource to initiate consultation with community groups, government and AKDN agencies, other than the AKTC. It includes the following key principles for development:

- Improve urban infrastructure
- Create a compact, liveable urban centre
- Promote a self-reliant community
- Focus growth on safe sites
- Capitalize on tourism and economic growth potential
- Synchronize services with growth
- Promote environmentally friendly inter-urban transport

It recommends areas for densification, sites for public space creation, proposes AKDN and institutional sites, housing growth strategies and recommended typologies, and proposes redevelopment of certain buildings and infrastructure improvements. It also proposes a wider scale pedestrian and bicycle connectivity strategy. At the neighbourhood scale, it provides landscaping and urban design drawings for improvements to public spaces with a focus on the river edge, connecting to a proposed wider park network. It suggests environmentally efficient infrastructure, identifies possible economic sectors to be promoted, and covers implementation strategies and next steps. This document provides a suggested organisation structure for AKDN and a zoning plan.

10.05.10 MGB Strategic City Plan (full set of drawings)

This document provides additional maps to the document submitted two months prior, in March of the same year.

14.07.10 AKTC + MGB Strategic City Plan: Proposed Zoning Structure (draft)

The Proposed Zoning Structure document outlines a process and structure of zoning, to facilitate implementation of the Strategic City Plan. Local communities did not participate in the development of this zoning plan and it suggests additional studies be undertaken to support the zoning recommendations in two areas, as well as increasing governance capacity to facilitate dissemination to local communities.

The zoning plan arranges the districts by building use and provides for a comparison of density, set-back and parking allowances. The zoning plan includes general regulations, district and sub-division zoning, a zoning matrix and map.

03.08.10 MGB Mission Report

The purpose of this mission report is to highlight the key events and outcomes from a series of meetings held between AKAH, MGB and the government of Tajikistan. The mission's aims were to:

- Share ideas regarding leading planning methodology and concepts through focused presentations and collaborative workshop sessions.
- Discuss core principles, driving factors and successful aspects of the planning work driven by both the Government of Tajikistan and AKTC.
- Identify a common set of planning principles to act as a basis for future collaborative work in Khorog.
- Explore neighbourhood-specific goals and opportunities through onsite discussion and illustration-based planning sessions.
- Continue to identify opportunities and generate ideas regarding smaller-scale public space pilot projects within each neighbourhood.
- Discuss possible methods of future collaboration and means of providing technical support to the GoT planning team with AKTC.

10.07.13 AKTC + MGB Strategic City Plan: Presentation

This presentation is a reiteration of the Strategic Plan, with additional detail on the recommended mixed-use typology, the river edge, public space design and housing density. The housing density component builds upon existing government residential densification drawings, suggesting design features and further units.

18.08.17 MGA Masterplan

This document was prepared by Michael Green Architects in 2017, an off-shoot of the MGB group that collaborated on the Strategic City Plan and Zoning Structure in 2010.[03] This masterplan contains conceptual architectural drawings that provide suggested urban design improvements at the neighbourhood scale, as well as suggestions for a city-scale transport network.

This document includes phase 3 area design studies that had been proposed in 2010 and suggests that they are still relevant for development under the new city conditions. The phase 3 area design studies focus on three main sites within the town centre with suggestions for infrastructure improvements, landscaping, public space design, street layout and increased building height. The three main sites are:

- Area A | Hospital Upland Improvements
- Area B | River Edge Improvements
- Area C| Lenin Street Improvements

This document provides phase 4 area design studies that focus on the two main areas of the town centre and the UCA development ('college town district'). These have been updated in accordance with a new review of the city conditions and include:

- Area D | UCA College Town
- Area E | Transportation System Management
- Area F | Expanded Serena
- Area G | Cultural District
- Area H | Jamat Khana South Hillside
- Area I | Jamat Khana Road
- Area J | Airport
- Area K | Tourism

These area design studies are diverse in their approach, providing urban design recommendations as well as recommendations for action, new assessments or partnerships to be explored to trigger development in certain spatial areas or financial sectors.

4.1.1. What is the Planning Assessment Tool and how to use it?

The aim of the PAT is to identify strengths and weaknesses of the current plan to guide future planning, rather than simply scoring the existing framework. The PAT constitutes a means of guidance and control for the elaboration of a new plan and therefore, represents both a practical and aspirational checklist for the fundamental elements required in a city-scale plan and its overall approach toward sustainability.

The PAT is divided into three categories – comprehensiveness, articulation and implementability. Each category has a number of indicators. Each indicator is scored from 0 to 2, with 0 being the lowest and 2 being the highest. There are 75 indicators allowing a maximum score of 150. The final scoring of the PAT is divided into broad ranges of Low, Medium, and High categories.

A Low score range indicates weak performance of the plan in that theme or section. These indicators with a low score range require urgent attention to ensure that the city progresses towards and meets its desired vision.

A Medium score range indicates average performance of the plan in that theme or section and has scope for improvement. A medium score is also a signal of caution to alert authorities of the need to monitor and re-direct efforts and resources so as to avoid progression to a low score level.

A High score range indicates healthy performance of the plan in the theme or section and that the plan is close to meeting its desired goals for the city.

Plan Comprehensiveness 18 indicators	Plan Articulation 28 indicators	Plan Implementability 9 indicators	Percentage Range	Category	Evaluation
0 - 12	0-18	0-6	<33%	Low	Consider revising the entire section
13 - 24	19-37	7-12	33% - 66%	Medium	Consider revising weaker themes of the section
25 - 36	38 - 56	13-18	>66%	High	Consider strengthening the current section with additional/ missing information

Outcomes of the Plan Assessment Tool for the AKTC Plan

The following summarises the outcomes of the assessment in the AKTC plans and shows the indicators used for all plan assessments.

Plan Comprehensiveness Justification and Reference

A clearly defined vision with goals, thorough and accurate baseline data and a robust participatory process is critical to understand the city and any future challenges to its sustainable growth. The plan must be organized and structured in a coherent way making it easily comprehensible and accessible to the public. To strengthen the comprehensiveness of the plan, the city must invest its resources on data collection in the form of surveys, document and literature reviews, spatial resource mapping and defining the scope, vision and objectives of the plan.

Data should be validated on the ground with input from the community through public participation processes to identify gaps and shortcomings and then aligned with other ministries/agencies and national and regional priorities.

Data collection and validation alone isn't sufficient to draft a successful plan. The data must be analysed to understand patterns and trends in the functions of the city and how to establish mechanisms for improvement.

Plan Comprehensiveness Assessment

The first indicator is plan clarity, in which the score outcome on the plans in Khorog was low. The vision is limited in its ability to bring together perspectives as it is not founded upon a participatory process, and principles are broad, without strong justification. In addition, without a data or forecasting, the plan's applicability over time is unclear.

This ties into the third indicator which relates to participatory processes. This is limited for both the redaction and approval of the Strategic City Plan.

For the sub-category of the plan's data-base, the assessment gives a low score outcome. There is limited evidence of steps taken to lead to the conclusions and recommendations given. This is particularly relevant in reference to the limited population data, which is key to inform all areas of the plan with respect to both the current and future city.

Total Score: 13/36
Category: Low
Evaluation: Consider revising the entire section

A low score in the first section indicates that the plan is weak or unclear in defining a vision and goals, clarifying plan coverage and relation to other plans, integrating data and analysing of existing conditions in the city, and/or misses the public participation process.

UN-Habitat and AKAH's Acknowledgement and Project Approach

UN-Habitat have undertaken an extensive data collection process in collaboration with AKAH. This data collection has highlighted data gaps, facilitated the collation of data into a City Profile report, ensured a fuller comparative analysis and diagnosis phase for the project, and allowed for new data collection methods to be implemented, including the creation of a comprehensive topographical map and mobilisation of neighbourhood representatives to gather data at the local level from stakeholders and community members.

The City Profile exercise facilitated a full basis of research and an initial spatial mapping of resources, both of which were validated in two stakeholder workshops; the first with strategic stakeholders including the mayor of Khorog, representatives from a number of the Aga Khan Development Network's agencies, and the Head of the public organization "Madina" as a community representative. The second included a smaller group for technical review, including representatives from utilities providers and international technical experts.

Finally, the diagnosis phase of this project has been used to develop evidence-based recommendations that will also be discussed and validated through a workshop and feedback sessions.

Category: Plan Comprehensiveness

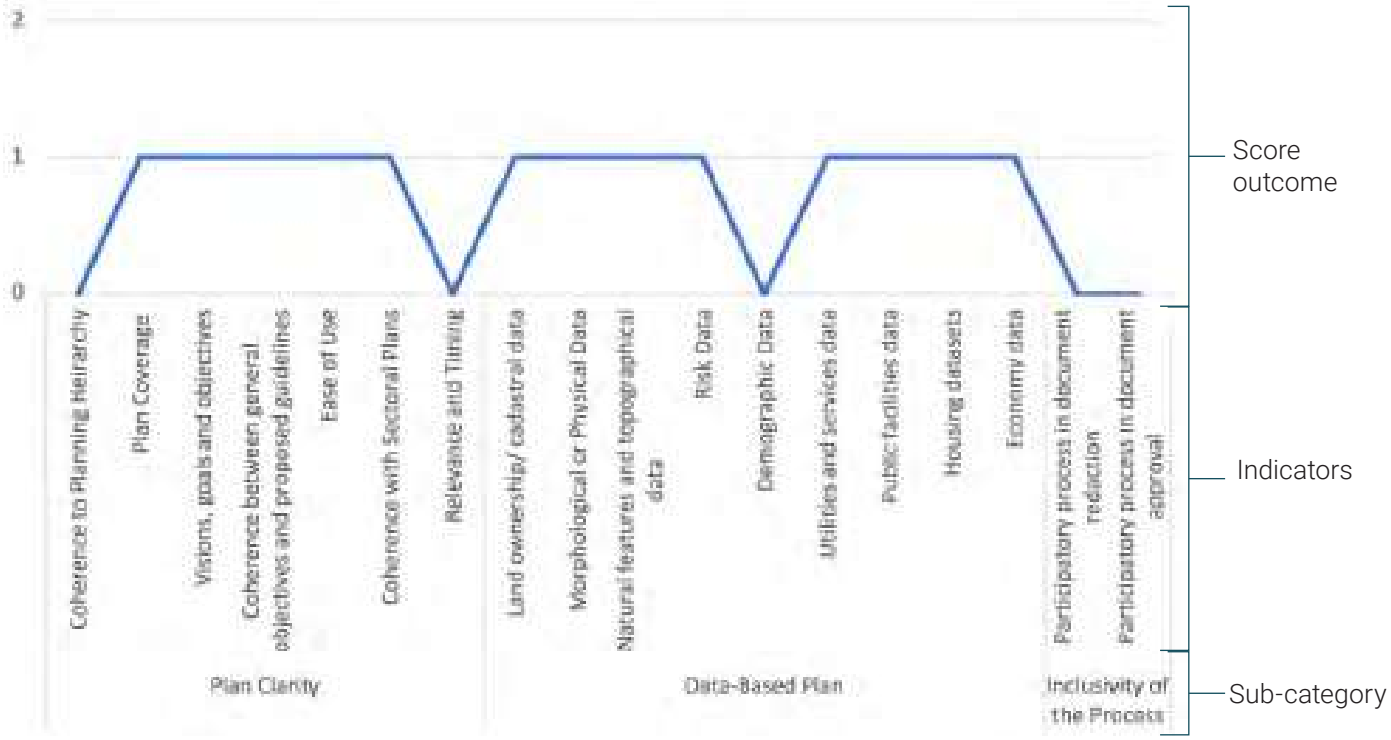


Fig 129. Plan Comprehensiveness

Plan Articulation Justification and Reference

The plan articulation section represents the core of the city-scale plan content, with a special emphasis on spatial elements to understand the changing dynamics across a city. Here is where the vision for the city gets shaped through social, physical, environmental and economic guidelines and proposals.

To strengthen the articulation of the plan, it should focus on providing guidance that is context-specific and address challenges across all aspects - social, economic, legal and environmental - in a comprehensive way.

The guidelines or recommendations should be clear, precise, and easy to comprehend for the general public, landowners, developers, and planners alike. Unclear strategic directions will tip the balance in favour of select groups in the community, leading to dissatisfaction and conflict.

Plan Articulation Assessment

For the social themes sub-category, the plan demonstrates limited acknowledgement of informal and social housing. It shows an awareness of a diversity of housing types and basic service provision, however, these do not feature in the reccomendations. The AKTC plan focuses on regenerative target interventions, which suggests a lack of recognition of the existing challenges to basic urban service provision in Khorog, as well as the issue of construction on land prone to natural hazards.

Economic incentives such as touristic growth and economic diversification by neighbourhood is recommended by the AKTC plan, however, without evidence of economic data assessments, these recommendations cannot be corroborated.

The spatial/physical articulation indicators achieve a slightly higher average scoring. This is due to the plan's articualtion of a transport and mobility strategy, as well as it's detailed supporting zoning plan. However, the score outcome is still limited by the plan's prioritization of one area of the city, rather than addressing the city in its entirety, including the town of Tem, which is located within the city boundary and plays a role in transport and connectivity.

Where relevant, the plan presents specific landscaping and urban design guidelines in an effective and detailed manner.

Considering the environmental challenges that Khorog faces, the final sub-category of Plan Articulation, 'environmental themes' is considered an important element of the master plan. However, the low score of the indicators within the 'environmental themes' sub-section show that recommendations are only partially able to alleviate these challenges, and there is no acknowledgement of a broader environmental strategy.

Total = 25/56
Category = Medium
Evaluation = Consider revising weaker themes of the section

A low score in this section indicates that the plan doesn't address the issues identified and misses the adequate guidelines or recommendations required to achieve the vision.

UN-Habitat and AKAH's Acknowledgement and Project Approach

Whereas the existing masterplan focuses on specific intervention sites, UN-Habitat's integrated approach provides spatial strategies and interventions based on a comprehensive assessment of environmental and socio-economic resilience in the whole city. The project process aims to address immediate and urgent issues that the city faces and it does so considering the whole city boundary, including Tem.

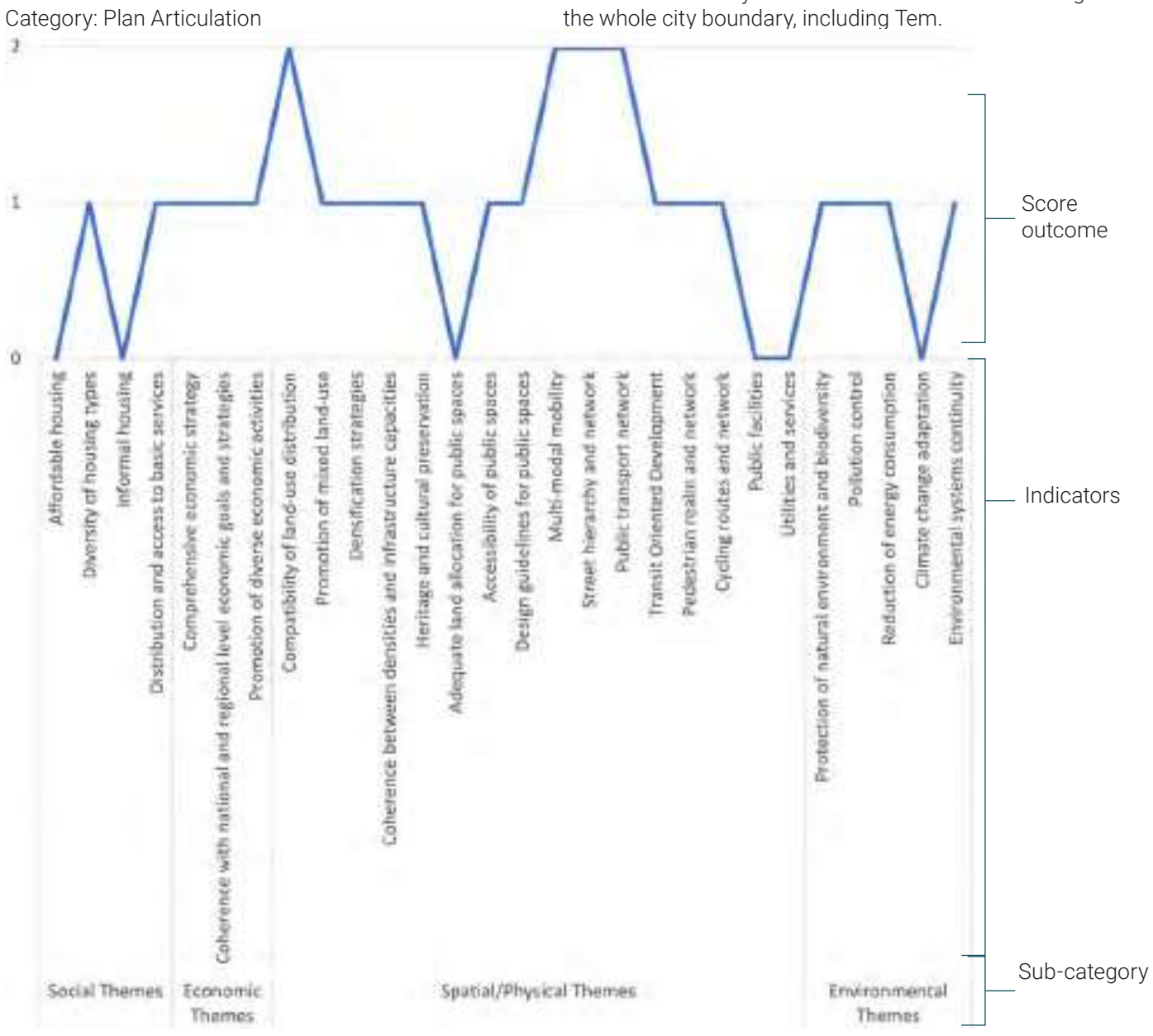


Fig 130. Plan Articulation

The project team also coordinates with the Urban Planning Legislation Unit and aligns to global sustainable development agendas, the Sustainable Development Goals, New Urban Agenda and the Sendai Framework on Disaster Risk Reduction to provide a more comprehensive and sustainable outcome of the planning process.

Plan Implementability Justification and Reference

This section considers elements necessary for the proposals to be feasible thus ensure the plan's implementation on the ground. To strengthen the implementability of the plan, assessing and acknowledging the city's capacity in terms of financial and legal frameworks play a critical role.

Dissemination and easy access to the plan by the public will build consensus and trust between the community and the city. Working together with the legal and finance teams is important to ensure the feasibility of the plan's vision.

Plan Implementability Summary Assessment

There is no evidence of an assessment of, or alignment with a legal framework in this master plan, however, there is an acknowledgement of land development regulations.

For the sub-section relating to technical and financial capacity, there is some suggestion of financing bodies and of a phased approach to the interventions recommended, though both are without detail, the phasing is lacking justification through a forecasting assessment, and there is no evidence of a thorough financial assessment.

Coordination and transparency scores low as there is no evidence that the plan has been shared with or considered by the local community. The challenges associated with communication between local authorities and communities is particularly relevant in this context, which suggests more weighting should be given to this component in order to produce a sustainable masterplan for Khorog.

Total Score = 5/18
Category = Low
Evaluation = Consider revising the entire section

A low score in this section indicates that while the plan may be comprehensive in itself, its implementation will prove to be a challenge moving forward.

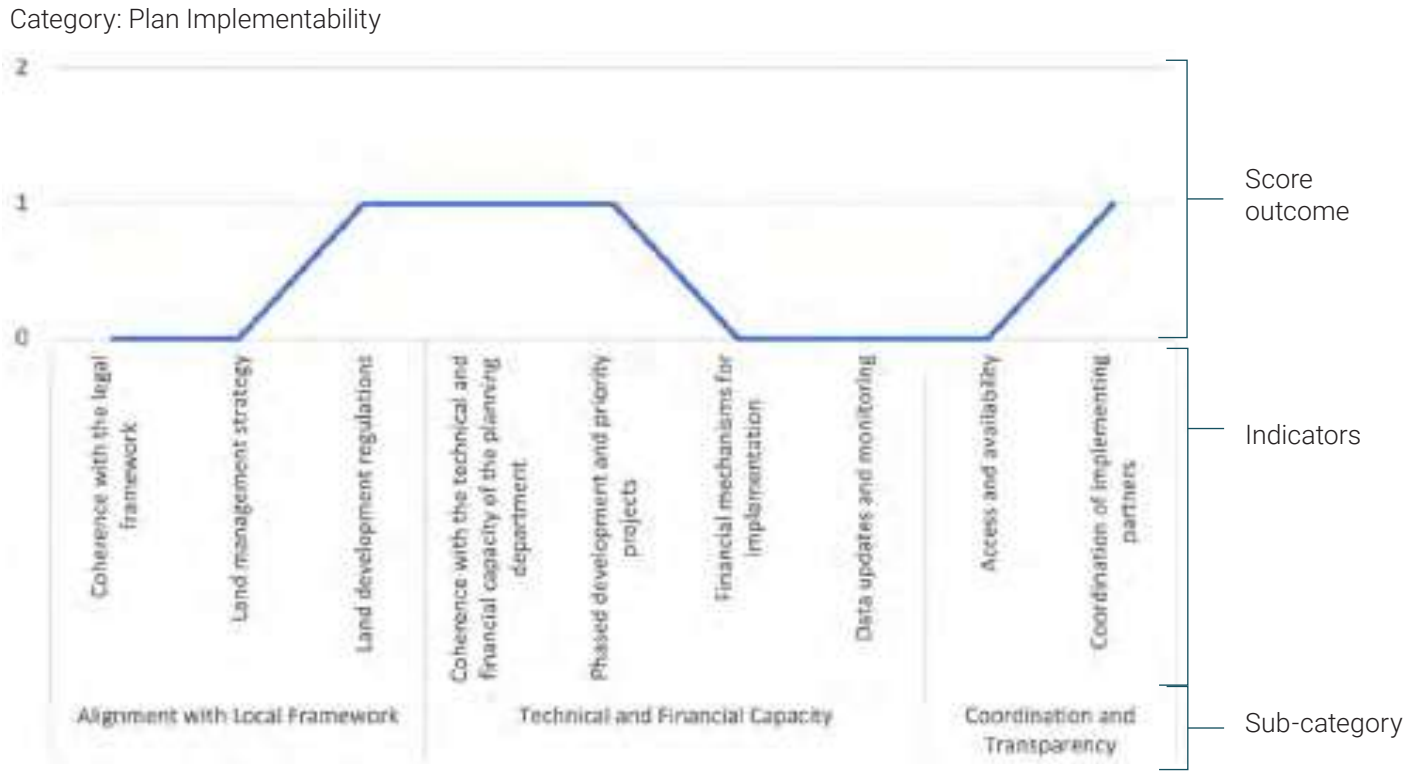


Fig 131. Plan Implementability

UN-Habitat and AKAH's Acknowledgement and Project Approach

UN-Habitat and AKAH have already approached the project in a participatory way, including stakeholders in data collection through interviews, data validation workshops, diagnosis and strategic workshops, and in a validation of the final spatial strategies proposed. Workshops, presentations and interviews have been given in English, Tajik and Russian to gather as much information as possible and record perspectives accurately in the planning process. Formats such as group workshops and individual meetings have facilitated the expression of a diversity of views.

The project considers capacity assessment and training, as well as an extensive legislative review and analysis, which informs the spatial strategy. The legislative review was conducted in collaboration with UN-Habitat's Policy, Legislation and Governance Section and provides a strong institutional resilience component to the project work.

The existing financial governance system has been outlined in the City Profile and will be used to inform the financial feasibility of recommendations. A Capital Investment Plan and Multiple finance (OSR) analysis with recommendations is also a recommended tool for the continuation of the project (Phase II), in order to align development strategies more closely with the city's financial planning.

4.1.2. Plan Assessment Summary

This master plan assessment of the 2010 AKTC plan is consistent in each category in highlighting three main limitations:

- The process of data collection, evaluation and justification of recommendations is missing from the documents, yet a crucial part of the plans to be communicated.
- Community and stakeholder participation, access to utilities and the risk of natural hazards. The gravity of these three challenges for the city are not adequately acknowledged through the plan and its recommendations.
- Although drawings and urban design details are provided, there is no evidence that the plan is supported by legal, financial, maintenance, management or governance proposals and does not acknowledge alignment with or address local, regional, national and global goals and guidelines.

However, this plan does suggest that the recommendations are conceptual and certain elements of the plan can be built upon, such as the mobility and transport plan, urban structure, areas of densification, and detail in regards to public spaces and mixed-use buildings.

The recommendations given can also be cross-checked and justified against new data collected and diagnosis undertaken by UN-Habitat. They can be built into spatial strategies and provide a comparative understanding of how the city has changed over time.

4.2. ADDITIONAL APPLIED TOOLS

City Resilience Profiling Tool

UN-Habitat's City Resilience Profiling Tool (CRPT) provides a cross-cutting diagnostic for resilience-based urban development. The tool was developed to provide a holistic approach to building resilience across the entire urban area to all shocks and stresses. The tool provides a framework for data collection, identifying relevant stakeholders and plausible shocks and stresses to allow a preliminary identification of gaps and opportunities over a series of different aspects regarding the city's structure and functionality while also providing a baseline for future actions.

The tool follows a multi-sectoral, multi-shocks and stresses and multi-scale approach to emphasize that cities function as urban systems, integrated and interdependent. It has been designed to collect information to provide a resilience profile, evaluate urban resilience through a diagnostic methodology and develop Actions for Resilience (A4R) tailored to each city. The Actions for Resilience provide a roadmap for local governments to initiate positive changes through preventive actions and hazard assessment, combining risk reduction measures, vulnerability reduction measures and improvement capacity building and sustainable development.

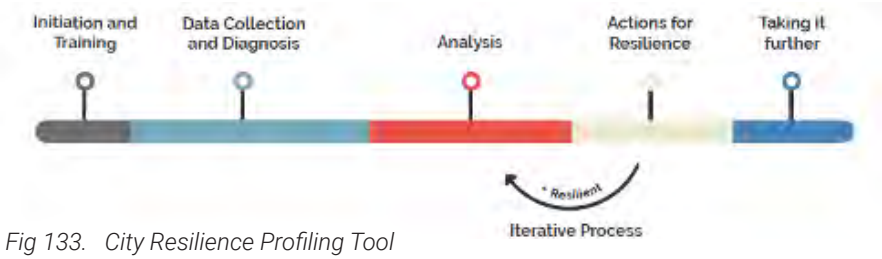


Fig 133. City Resilience Profiling Tool

City Resilience Action Planning (CityRAP)

The City Resilience Action Planning (CityRAP) Tool, developed by UN-Habitat, aims to enable local governments of small to intermediate sized cities, or neighbourhoods/districts of bigger cities or metropolitan areas, to plan and undertake practical actions to strengthen the resilience of their cities. The CityRAP tool is process-based and puts local governments and urban stakeholders in the driver's seat of urban resilience planning from Day 1, with its key principle being bottom-up planning.

The tool identifies five pillars to resilience: urban governance, urban planning and environment, resilient infrastructure and basic services, urban economy and society, and urban disaster risk management. It is divided into 4 phases as described below.

The tool is initially developed for city authorities and local governments, and includes a set of training exercises and activities, with an application process of two to three months. However, various concepts of the tool have been used throughout UN-Habitat's work in Khorog including the conceptual understanding of resilience and its various components, survey questions and diagnostic tools. This would not only provide a structure to UN-Habitat's work, but would also acquaint local governments with the tool, in case they are interested to delve deeper into resilience and the tool.

Fig 134. City RAP

Making Cities Resilient

The UN Office for Disaster Risk Reduction (UNDRR) and its partners launched the 'Making Cities Resilience' (MCR) Campaign in 2010 to raise awareness on urban risk reduction with city leaders and local governments, promoting collaboration with local partners, grassroots networks and national authorities. As part of the campaign, the "Ten Essentials for Making Cities Resilient" were developed to provide basic building blocks for understanding disaster resilience at local levels. These guidelines were adapted and aligned to the Sendai Framework for Disaster Risk Reduction (2015-2030). The Ten Essentials are critical and independent steps that need to be undertaken to build and maintain resilience and are grouped into three categories: governance and financial capacity, integrated planning and disaster preparation, and disaster response and post-disaster recovery.

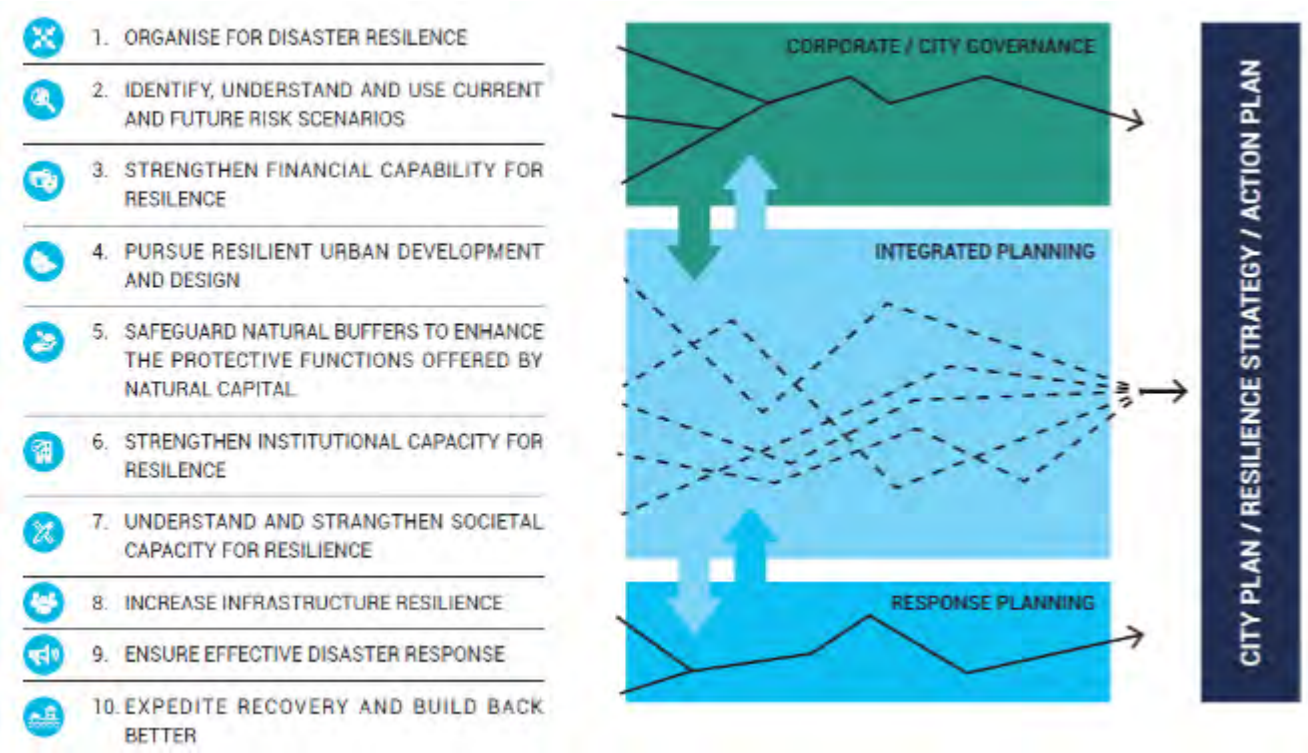


Fig 135. Ten Essentials for Making Cities Resilient

Disaster Resilience Scorecard for Cities

UNDRR have also developed the Disaster Resilience Scorecard for Cities, with support of the European Commission, IBM, AECOM and other partners and cities participating in the Making Cities Resilient Campaign. The scorecard provides a set of assessments that allow local governments to assess their disaster resilience based on the Ten Essentials described earlier. UNDRR's sub-regional liaison office for Central Asia, located in Kazakhstan, has been contacted during the development of the Khorog City Profile. The outcome of this engagement identified that the UNDRR sub-regional liaison office is currently implementing the scorecard in 5 cities in the region, including Dushanbe. Continuous coordination with the office was therefore identified as essential for the development of the profile and lessons learned from the implementation of the scorecard will be taken into account throughout the programme.

UNDAF

UN-Habitat will contribute to the outcome of the strategic focus area "Resilience and Environmental Sustainability" of the current United Nations Development Assistance Framework (UNDAF) agreed between the Government of Tajikistan and the United Nations on 18 December 2015. UNDAF (2015-2020) aims to reinforce a strong partnership between the Government of Tajikistan and the United Nations Country Team (UNCT) to achieve the Sustainable Development Goals (SDGs) by advancing equitable economic growth and reducing poverty; human rights protection and promotion through capacity development; strengthening of strategic and policy frameworks; enhancement of accountability systems including in relation to UN human rights machinery and the delivery of quality social services.

Through this project, UN-Habitat has maintained constant communication and coordination between the Urban Lab - Planning Finance and Economy Section (PFES), the Programme Development Branch, Project Coordination Office for CIS Countries in Moscow internally, as well as the United Nations Resident Coordinator's Office (UNRC) and United Nations Country Team (UNCT) in Tajikistan. This has allowed for a broad understanding of UN-Habitat's contribution to Tajikistan's achievement of the SDGs, in consultation with the other agencies that are engaged in this country in relation to the upcoming cycle of UNSDF.

4.3. ENDNOTES

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02. International Organization for Migration (IOM). 2016. "Assessment of Economic Opportunities along the Afghan-Tajik Border." Kabul, Afghanistan. Available online at: https://reliefweb.int/sites/reliefweb.int/files/resources/IOMT_border_final_after_publication_FINAL.pdf

03. MGA states that the zoning document was approved by national government, and that additional to the Strategic City Plan and Zoning Structure, an 'Administrative approach to Planning Approvals' and 'Project Development for the City of Khorog' was also developed. These two documents have not been reviewed as part of this assessment due to lack of access.

04. UN-Habitat's Five Principles for a Sustainable Neighbourhood. Available online at: https://unhabitatorg/a-new-strategy-of-sustainable-neighbourhood-planning-five-principles-0

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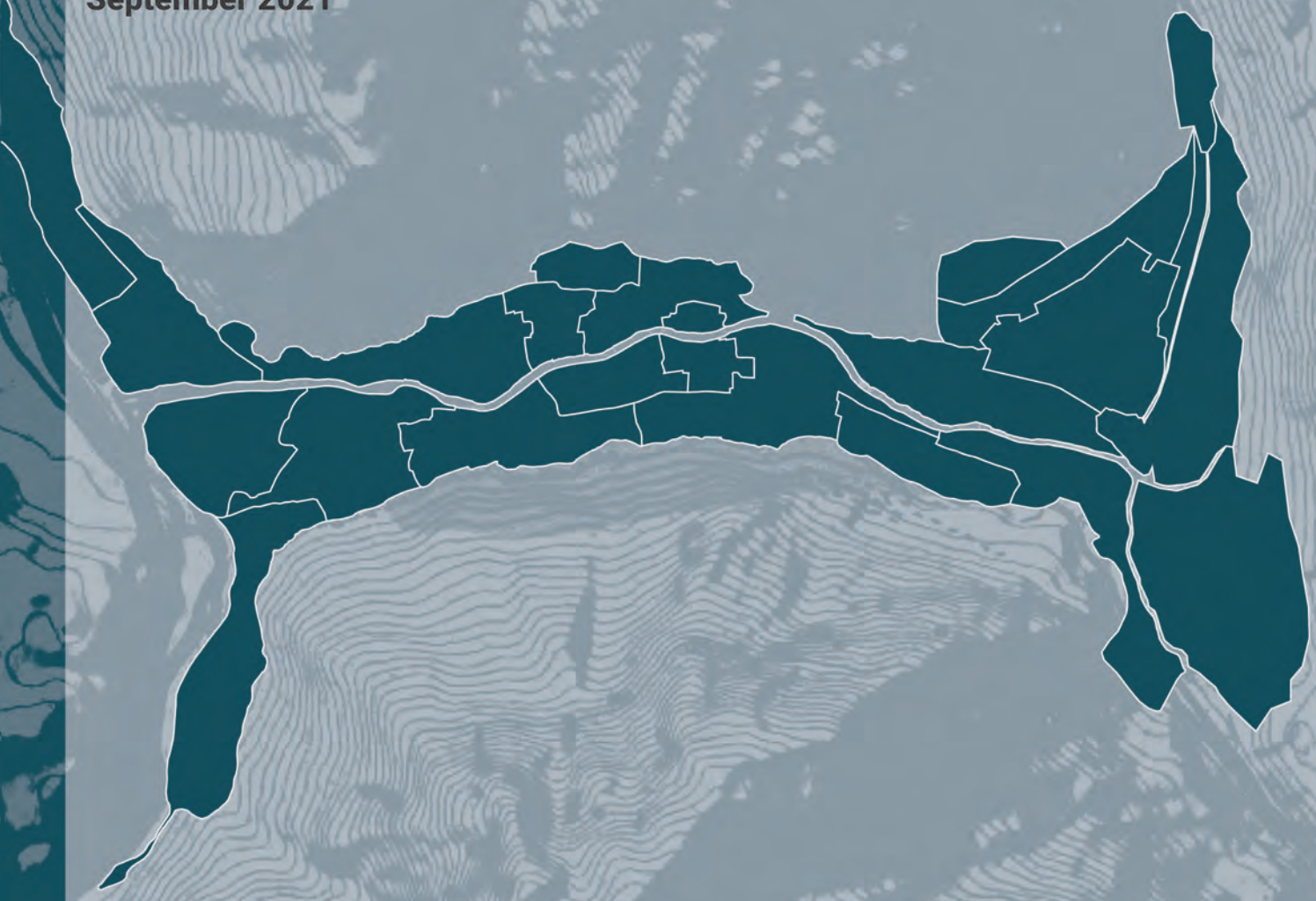
Integrated Spatial Plan for Environmental and Socio-Economic Resilience

KHOROG
Tajikistan

City Profile Part 3
Recommendations Report

September 2021



UN HABITAT
FOR A BETTER URBAN FUTURE

Aga Khan Agency for Habitat

Habitat Planning
A Programme of the Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience
Khorog, Tajikistan

City Profile Part 3: Recommendations

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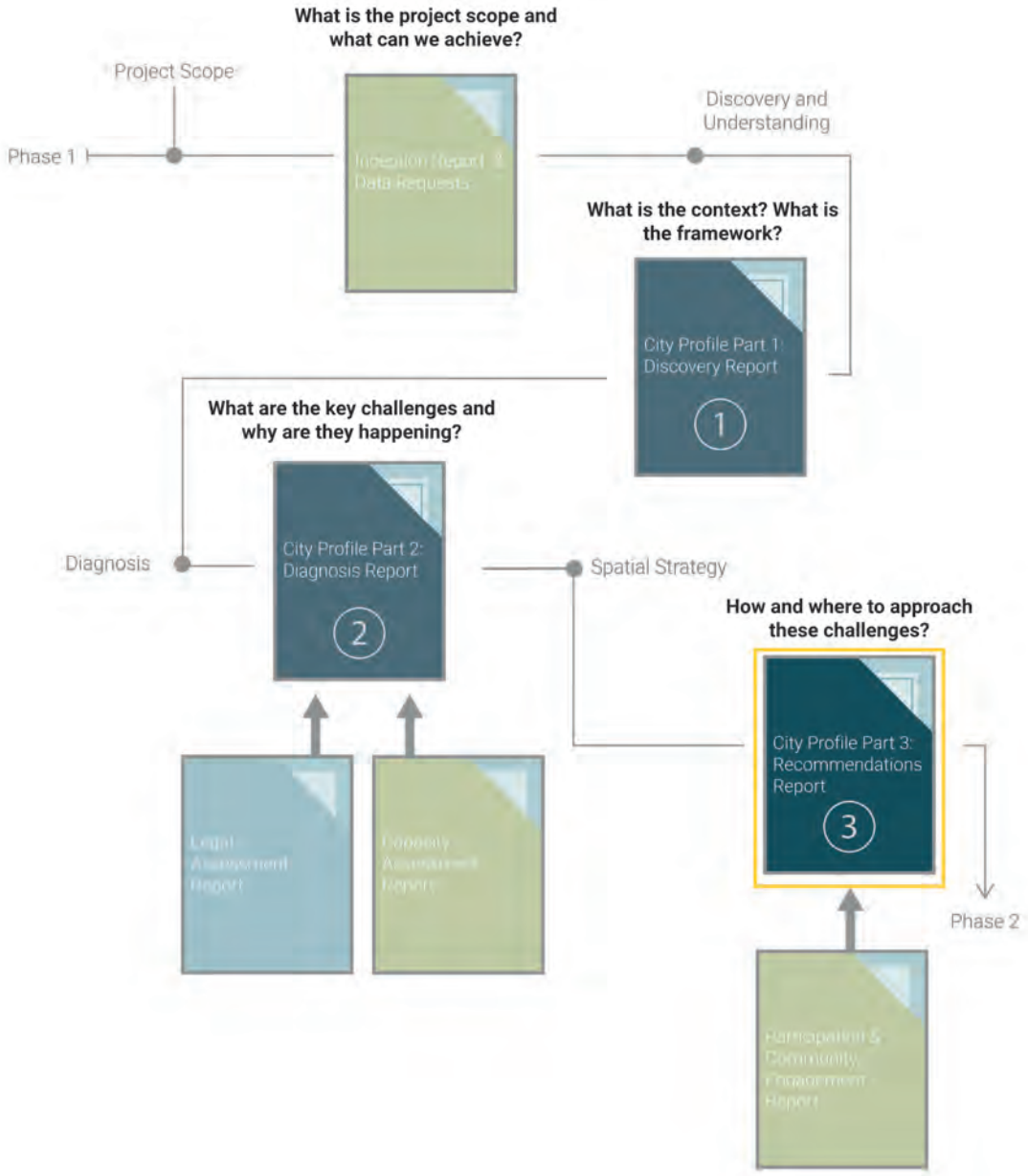
Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

Habitat Planning

City Profile Part 3
Recommendations Report



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1

INTRODUCTION

1.1. INTEGRATED SPATIAL PLAN FOR ENVIRONMENTAL AND SOCIO-ECONOMIC RESILIENCE

UN-Habitat has partnered with the Aga Khan Agency for Habitat (AKAH) and the government of Tajikistan, through the Aga Khan Development Network (AKDN), to undertake the 'Integrated Spatial Plan for Environmental and Socio-Economic Resilience' in Khorog Tajikistan. UN-Habitat's Urban Planning and Design Lab (Urban Lab), in a collaborative process with other units and branches within the UN-Habitat Planning Finance and Economy Section and the Urban Practices Branch and with AKAH's Habitat Planning teams in Geneva and Tajikistan, aims to provide planning direction to improve resilience and social stability for existing communities and accommodate the increasing populations in Khorog in a sustainable way through:

1) developing strategies, masterplans, interventions, and regulations.
2) knowledge creation, capacity building, and guidelines.

More specifically, the project aims to provide environmental, legal, economic, spatial and infrastructure policies and projections, governance and management, recommendations for transformative projects, and planning and technical capacity building for stakeholders. The UN-Habitat, in concert with AKAH's Planning methods and advanced data collection and analysis, provide planning expertise, drawing on existing methodologies, toolkits, and best practices in a collaborative and integrated way to guide the growth of Khorog.

This project is one of several outcomes from an assessment of resiliency that was undertaken for Khorog in 2017 and 2018 by the Swiss State Secretariat for Economic Affairs (SECO) and Holinger, with partnerships from the international community that include the European Union for resilient infrastructure, the Government of Japan, the IFC and World Bank.

The work of UN-Habitat in collaboration with AKAH is part of The Khorog Urban Resilience Planning and Proof of Concept Initiative, supported by SECO to drive resilient infrastructure investment and access to basic public services, intended to reducing risk, ensure more reliable infrastructure and a safer environment. This will, in turn, improve economic growth and wellbeing. This project has been undertaken in parallel with other initiatives for Khorog, such as the EBRD and SECO funded phase 1 and 2 water infrastructure projects.

AKAH looks to UN-Habitat to support the Revised Town Planning process in a way that can ensure alignment of the town plan to UNDRR resilience principles and best practices. The integrated plan for environmental and socio-economic resilience in Khorog will integrate the disaster risk reduction approaches within the planning processes of identified projects.

1.2. REPORT ROLE & CONTEXT

This report provides the outcomes from a process of analysis and diagnosis. It highlights key responses to the identified challenges, and provides recommendations for spatial strategies and urban design considerations, actions, and suggestions for legislative review. This report, therefore, is a stepping-off point, from which to develop further actions, with the close participation from specific stakeholders, government officials, Rais of the Mahallas, and community members. The strategy and action recommendations provided here can be extended further to form a mechanism with which to adjust existing and future town plans. This document is both detailed, to provide strategic, multi-

dimensional and specific recommendations, as well as practical. For example, the Action Plan (see chapter 3), can be used as a tool to encourage strong collaborative decision-making processes with various stakeholders.

This report is the final in a series of seven reports that make up Phase 1 of the Integrated Spatial Plan for Environmental and Socio-Economic Resilience Project. Additional outcomes of this project have included training and capacity-building, presentations and participatory workshops. The key deliverables are listed in Table 1, alongside an explanation of the key steps in phases 1 and 2.

The timeline in Figure 3 highlights the project actions and milestones. The original project scope and timeline was amended to account for travel limitations associated with extreme weather conditions and the COVID-19 pandemic.

1.3. ALIGNMENT WITH FRAMEWORKS AND TOOLS

1.3.1. Habitat Planning Framework

The City Profile Part 3: Recommendations Report forms part of the Spatial Strategy. This part of the project aligns with three of the nine steps in the Habitat Planning Framework, from the phases of 'Pre-Planning and Vision' and 'Planning Priorities and Design'.

The **Habitat Planning** Framework is the core framework that informed the project process. It was developed by AKAH, in conjunction with the Resilience Framework for Action. AKAH is an umbrella agency for legacy organisations including the Aga Khan Planning & Building Services, Focus Humanitarian Assistance, the Disaster Risk Management Initiative, the Portfolio Management Office (PMO), and the Prince Sadruddin Aga Khan Fund for the Environment (PSAKFE) as well as the habitat-related activities of the Aga Khan Rural Support Programme (AKRSP) and the Mountain Societies Development Support Program (MSDSP). AKAH is part of the wider Aga Khan Development Agency. It's mission statement is as follows:

"To address the increasing threat posed by natural disasters and climate change, the Aga Khan Agency for Habitat (AKAH) works to ensure that poor people live in physical settings that are as safe as possible from the effects of natural disasters; that residents who do live in high-risk areas are able to cope with disasters in terms of preparedness and response; and that these settings provide access to social and financial services that lead to greater opportunity and a better quality of life."

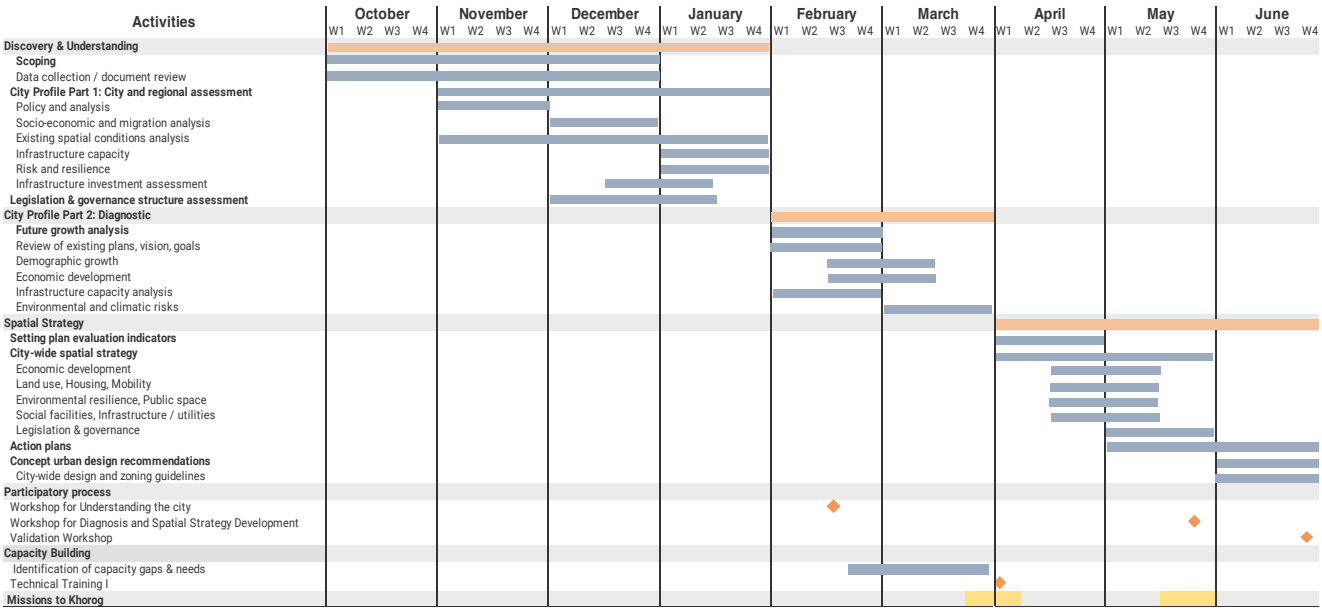


Fig 3. Positioning of the major participatory events within the project framework

PHASE 1	**Scoping, Analysis, Diagnosis and Spatial Strategy**			**Deliverables**
	Project Scope and Inception Report	What is project scope and what can we achieve?	This involves a review of existing reports and studies to understand the city, through desktop research. This formalised the project scope and next steps and identified gaps in the information available - requests for specific and updated data sets (GIS and other) were made and key stakeholders were identified for interviews.	• Inception Report • Data request
	Discovery and Understanding	What is the context? What is the framework?	Stakeholders were involved at this early stage, through discovery interviews. As resilience was the focus of the project, findings were directed by and filtered through four key areas; Environmental, Socio-Economic, Infrastructure and Basic Services, and Institutional Resilience. This first step informed the team of the challenges the city faced and directed the next stage of assessments.	• Discovery Workshop • City Profile Part 1: Discovery Report
	Diagnostic and Community Engagement	What are the key challenges and why are they happening?	This stage of work involved a data collection process, a data cleaning and series of assessments, based on the spatial resilience themes; environmental, socio-economic and infrastructure and basic services. The final theme, institutional resilience, was assessed by the urban legislation team and is included as an individual chapter alongside the data assessments. This step helped the team with a basis of understanding from which to identify focused community engagement activities, and on-site validation exercises.	• Diagnosis Workshop • City Profile Part 2: Diagnosis Report
	Spatial Strategy	How and where to approach these challenges?	This stage of work involved consolidating the challenges the city faced and identifying key spatial and non-spatial strategies by which to approach them. Not only can these set of plans and strategies support sustainable development in the city, but an understanding of the process can also be an opportunity for local government and stakeholders to take forward an evidence-based, participatory and collaborative approach to planning.	• Validation Workshop • City Profile Part 3: Recommendations Report
PHASE 2	**Transformative Projects, Implementation Tools**			
	Transformative Projects	How to actualise the plan?	This stage in the project involves identifying key pilot project sites, to showcase practical plan implementation, how the SDGs can be localised, and how an integrated approach to development can be actualised.	
	Capital Investment Plan	How aNd when to implement?	This tool provides a prioritisation of action plans and a finance and investment strategy to support plan implementation.	

Table 1. Project phasing and participatory events conducted

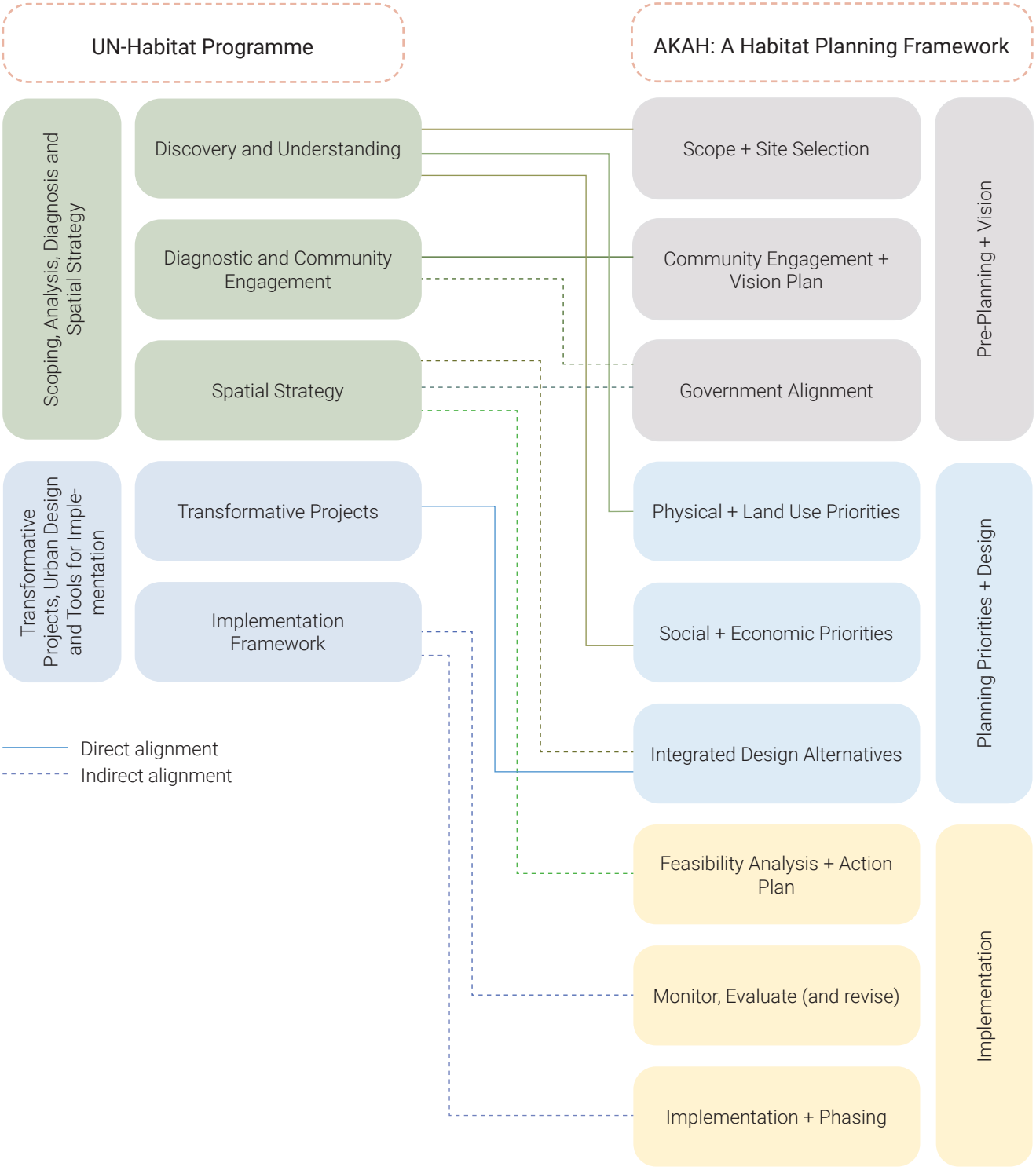


Fig 4. Alignment of UN-Habitat and AKAH's Habitat Planning Framework (using K. Intrator. Overview of Proposed Habitat Planning Process for AKAH, Version 2.0 August 2021)

The Aga Khan Agency for Habitat (AKAH) was created to address the increasing threat of natural hazards due to the effects of climate change, coupled with rapid manmade changes and insecurities have severe impacts on mountain and urban communities. AKAH created the Habitat Planning Framework in 2018 - an eight step process for assisting state or institutionally implemented mountain and rural urban planning projects through participation, data-driven decision making, design and implementation.

AKAH's eight-step process aims to assist urban planning projects in achieving the balance between the strategic planning and community action planning approaches outlined above. It also aims to set an example of enhancing the capacity of local institutions in both participatory and data-driven decision-making processes. When establishing the process AKAH reviewed the Village Development Plans (VDP) and Village Disaster Mitigation Plan (VDMP) methods used in the core target countries: Afghanistan, Tajikistan, and Pakistan. Existing spatial and nonspatial data in Afghanistan, Tajikistan and Pakistan were also analysed to understand how the process could build capacity for incorporating data collection and data-driven decision making into the method.

Pluralistic planning mechanisms and processes are required to reduce vulnerability and create a needs based planning system that will increase quality of life. This is addressed by both the Habitat Assessment and stage 5 - Integrated design alternatives.

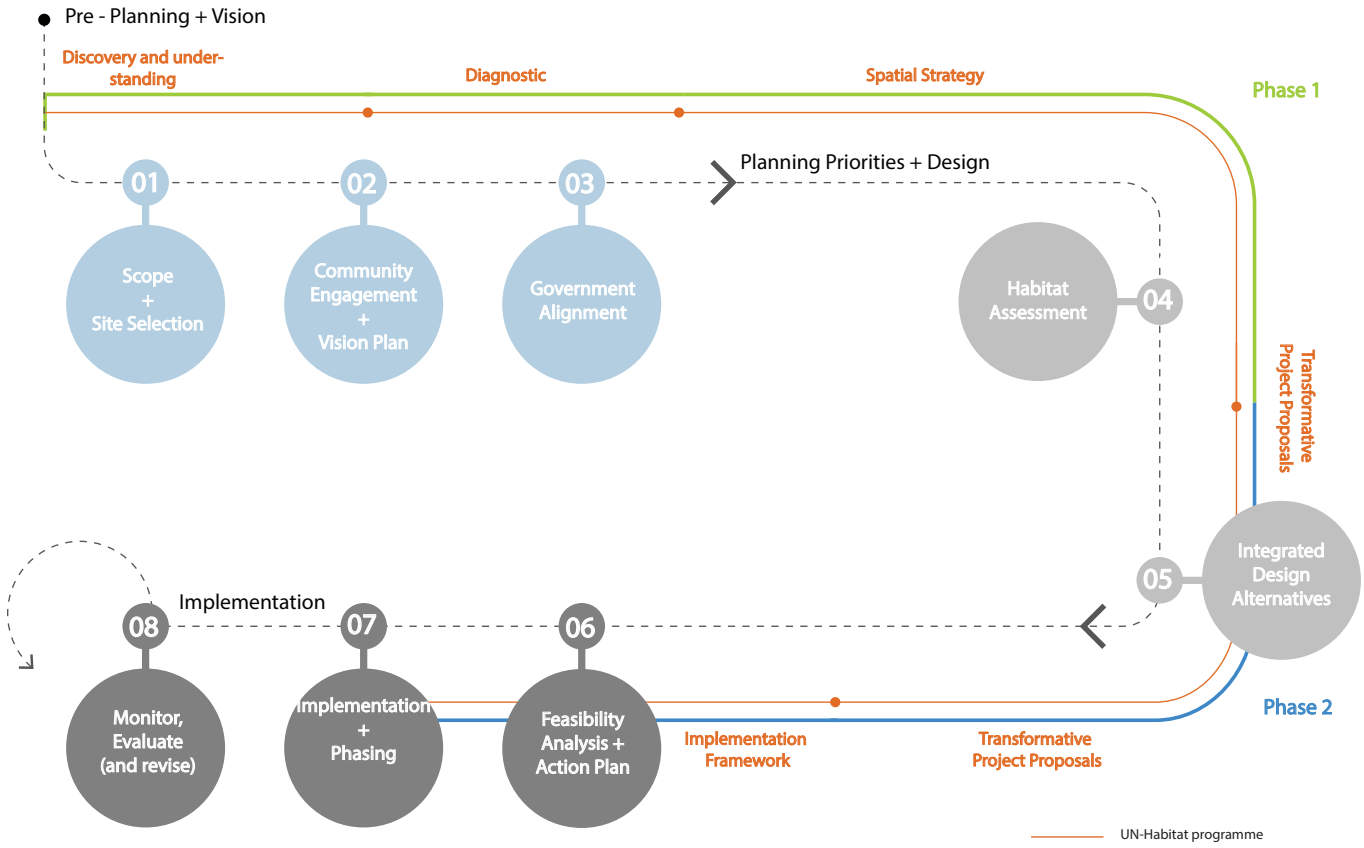


Fig 5. Planning framework (diagram built upon K. Intrator. Overview of Proposed Habitat Planning Process for AKAH, Version 2.0 August 2021)

In addition, Figure 6 shows part of the Habitat Assessment process, including the use of data collection in the capacity building and decision making processes that will be incorporated in Phase 2 of the Project (see table 1). The engagement of data driven decision making with the community's input addresses the long term local planning goals that are co-defined between the community and local authorities and can therefore be aligned and incorporated into wider urban plans. The process of using data in such a decision-making process also enhances community and institutional capacity to use data to support monitoring, evaluation, and future initiatives.

UN-Habitat's project outputs are heavily based on the knowledge and data collected by AKAH's planning team, contributing to the phases and steps of the AKAH's Habitat Planning Framework to ensure a unified, comprehensive strategic vision among all stakeholders. Figure 2 outlines the key elements of the Habitat Planning Framework, alongside the 'Integrated Spatial Plan for Environmental and Socio-Economic Resilience', to highlight the integration of approaches. Using an evaluation of both approaches, UN-Habitat's progress will be monitored against this framework to ensure alignment throughout the project timeline.

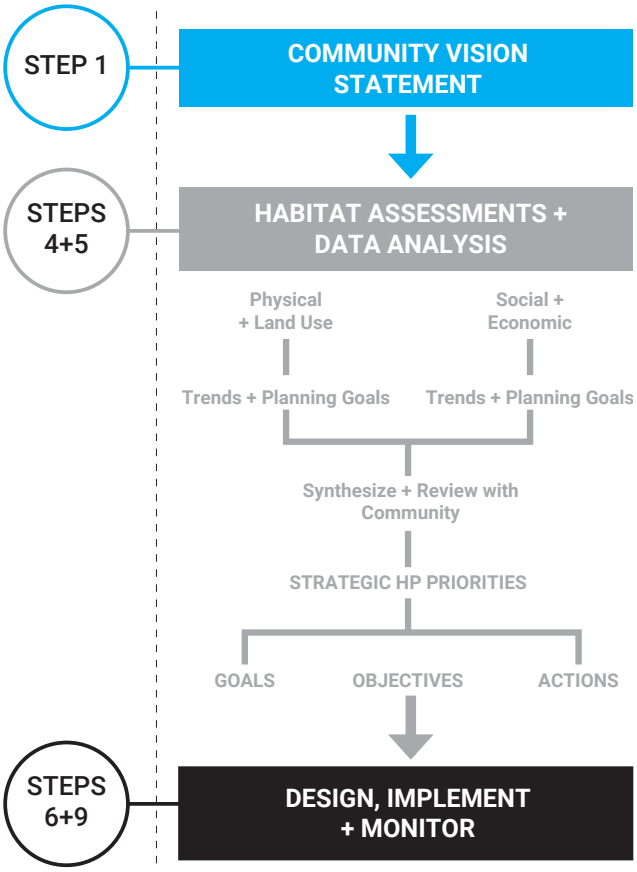


Fig 6. Strategy for developing Habitat Planning Priorities

Fig 7. Ismaili center in Khorog, May 2021

Fig 8. A view from the Ismaili center, May 2021

1.3.2. Participatory Incremental Urban Planning Toolbox

The Participatory Incremental Urban Planning (PIUP) Toolbox was used by the UN-Habitat team for Khorog. The PUIP, developed by UN-Habitat, is a step-by-step methodology to assess, design, operationalise, and implement urban planning processes. The toolbox provides flexibility to adapt the methodology to various contexts, based on different necessities and focus areas. By structuring a timeline of phases, blocks and activities, the toolbox assists urban stakeholders with a more comprehensive understanding of urban planning processes. It ensures stakeholders are engaged in a meaningful way, safeguarding the ownership of completed projects and creating potential for ongoing, multi-stakeholder collaboration.

The toolbox consists of four phases, 15 blocks, and 69 activities, as illustrated in Figure 6. Each block focuses on a specific topic and is further broken down into activities to enhance the adoption of participatory, inclusive and sustainable practices. The activities are supported by innovative tools and complementary materials produced by UN-Habitat.

The City Profile Part 1 and 2 align with the assessment phase of the Participatory Incremental Urban Planning Toolbox, comprised of blocks A. Contextualisation, B. Project Preparation, C. Participation set-up and D. Analysis and Diagnosis. The Spatial Strategy provided in this report aligns with both block E. Strategic Plan, and a portion of F. Conceptual Plan.

1.3.3. Applied Tools

Alongside the Habitat Planning Framework and PIUP, additional tools have been engaged with to align the project to best practices, processes and guidelines. These include the following:

- City Resilience Profiling Tool
- City Resilience Action Planning (CityRAP)
- Making Cities Resilient and the "Ten Essentials for Making Cities Resilient"
- Disaster Resilience Scorecard for Cities
- UNDAF

Additional tools deployed in the project processes, actions and outputs include the Resilience Profiling Tool, which has formed the framework for our

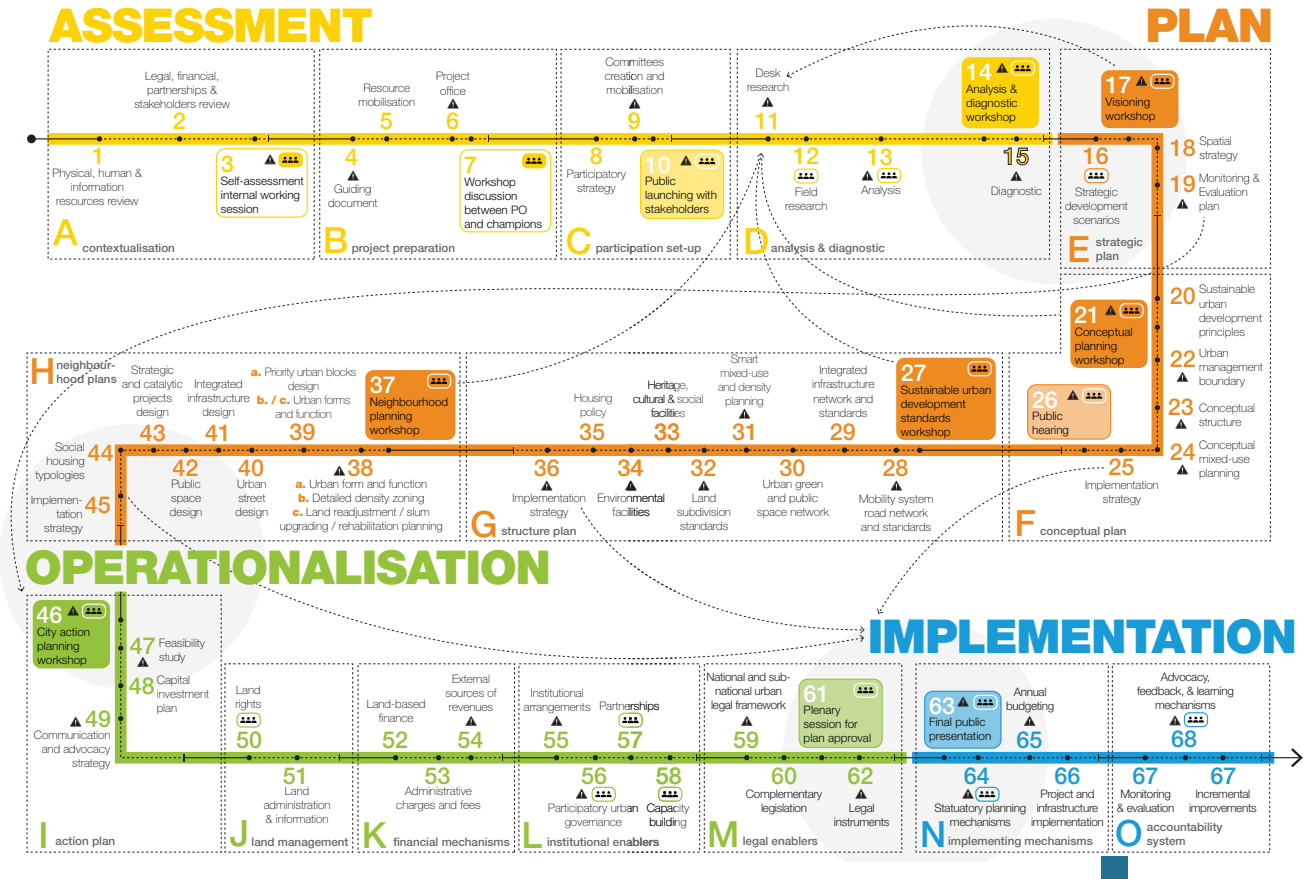


Fig 9. PIUP's phases, blocks and activities

assessment, City Resilience Action Planning, which was used to guarantee engagement with local actors, and the UN Development Assistance Framework, to integrate the UN Country Team in the formation of the project goals.

1.3.4. Alignment with Global Frameworks

While all measures proposed within the project are targeted for implementation at city level, it is envisioned that such priorities could be replicated to address similar challenges in other cities, and further scaled to regional and national levels. As such, the project is further strategically aligned to various international frameworks, while localising actions and recommendations.

1.3.5. Sustainable Development Goals

Through transformative strategies, the Khorog programme directly supports the realisation of SDG 11 on sustainable cities and communities, with particular reference to the following targets:

- 11.1: provide access for all to adequate, safe and affordable housing and basic services.
- 11.2: provide access to safe, affordable, accessible, and sustainable transport systems; improving road safety, notably by expanding public transport.
- 11.3: enhance capacity for participatory, integrated, and sustainable human settlement planning and management.
- 11.4: strengthen efforts to protect and safeguard the world's cultural and natural heritage.
- 11.7: provide universal access to safe, inclusive, and accessible green and public spaces.
- 11.A: support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
- 11.B: increase the number of cities adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement holistic disaster risk management at all levels.

In addition, the programme also supports actions for SDG 9 on resilient infrastructure, industry and innovation, SDG 12 on sustainable consumption and production, SDG 13 on climate action, and SDG 17 on partnerships, most notably with reference to the following targets:

- 9.1: develop quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being, with a focus on affordable and equitable access for all.
- 12.8: ensure that people everywhere have the relevant information and awareness of sustainable

Fig 10. The view on the city of Khorog, May 2021

development and lifestyles that can exist in harmony with nature.
- 13.1: strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
- 13.2: integrate climate change measures into national policies, strategies and planning.
- 17.16: enhance global partnerships for sustainable development, complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources, in order to support the achievement of the sustainable development goals in all countries, and in developing countries in particular.
- 17.17: encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies that these can bring.

1.3.6. NUA

Tajikistan is a signatory of the New Urban Agenda, with specific commitments that are manifested in the recent adoption of the National Development Strategy to 2030, which tackles new and traditional challenges that the country is faced with. Tajikistan has built on these commitments through the adoption of the 2030 Agenda for Sustainable Development, the SDGs, the Addis Ababa Action Agenda of the Third International Conference on Financing for Development, the Paris Climate Agreement, and the Sendai Framework for Disaster Risk Reduction 2015-2030.

This specific project in Khorog aligns with the Habitat III New Urban Agenda in meeting "the challenges and opportunities of present and future sustained, inclusive and sustainable economic growth". It also aims to provide the strategic spatial framework to "adopt and implement disaster risk reduction and management, reduce vulnerability, build resilience and responsiveness to natural and human-made hazards, and foster mitigation of and adaptation to climate change".

1.3.7. Sendai Framework

The Sendai Framework for Disaster Risk Reduction 2015-2030 outlines seven clear targets and four priority actions to prevent new disasters and reduce risk posed by those that are existing. The Khorog project is well aligned to the four priority areas and their key actions. It addresses priority 1; understanding disaster risk by promoting collection, analysis, management and use of relevant data to assess disaster risks, vulnerability, exposure, hazard and their possible sequential effects through the use of technological innovation and collaboration. The programme analysis of the current governance structure addresses priority 2; strengthening disaster risk governance. The programme's focus on financing and capital investment planning will ensure that prioritised measures are cost-effective and instrumental to save lives, prevent and reduce loss, and ensure effective recovery and rehabilitation. The latter point is further aligned to priority 3; investing in disaster risk reduction for resilience. Finally, through the development of building codes and demonstration projects, the project addresses priority area 4; for effective response and building back better in times of recovery, rehabilitation and reconstruction.

1.3.8. Paris Agreement on Climate Change

The project's focus on resilience aligns with the Paris Agreement on Climate Change by way of increasing Khorog's resilience in an ability to adapt to the adverse impacts of climate change. Within the Khorog context, this relates directly to the adverse impacts of flooding, droughts, avalanches and landslides. Such disasters have become more frequent in the area, with growing impact.

1.3.9. Paris Dushanbe Declaration for the International Decade on Water Action

The Declaration of The Decade for Action on "Water for Sustainable Development, 2018-2028", was launched in an event in Dushanbe in 2018. This event and resultant declaration highlighted the importance of water access and management for the achievement of sustainable development. This challenge is of particular importance to Tajikistan, as it will affect the country's ability to create resilience in the face of natural hazards, climate change and political vulnerabilities associated with resource ownership and management. The Declaration for the International Decade on Water Action is aligned with the focus on resilience in Khorog in such a way as to facilitate the realisation of Sustainable Development Goal 6; to "ensure availability and sustainable management of water and sanitation for all".

Fig 11. Pedestrian bridge , May 2021

Fig 12. The view on the city of Khorog from Botanical Garden, May 2021

2

SPATIAL STRATEGIES

The following chapter outlines 'issues' and 'responses' identified in the project's diagnosis. These issues and responses are summarised by eight key urban planning strategies.

These are city-wide strategies, they fulfil multiple roles, are inter-linked and integrated with one another, and have both spatial and non-spatial components. The strategies have been built to adapt to this specific context and are detailed out in each of the 'responses' in the following chapter.

Strategies can be primary 'key strategies', or secondary, 'supporting strategies', depending on the issue and response. These strategies have overlapping elements and should be considered together, not as individual elements.

This section introduces the eight key strategies in a general way, that will be further detailed and contextualised in the following chapters.

Growth Management Strategy

This strategy is a city-wide, multi-stakeholder approach to minimise the adverse impacts of city growth, whilst promoting sustainable urban development principles. This strategy is spatial and policy based, and requires legislation and management plans to maintain.

Adequate Housing & Relocation Strategy

This strategy promotes the right to adequate housing for all, not only by considering existing communities at risk, but also through the provision of new housing in the city. This strategy is supported by legislative and urban design guidelines and must be implemented in a participatory manner.

Urban Regeneration Strategy

Urban Regeneration Strategies respond to the negative impacts in select areas of the city resulting from changes in urban growth or productivity. This strategy attempts to address the negative on-set effects of underutilised areas of the city to improve the efficiency of the urban fabric (density and design) and incentivise economic growth in a sustainable and socially and environmentally equitable way.

Hazard Mitigation Strategy

Hazard Mitigation Strategies not only involve location-specific, targeted projects to reduce or eliminate the impacts of natural hazards, but they are coupled with non-spatial, policy-based strategies that facilitate monitoring, coordination, communication and learning, and promote broader behavioural changes to both prevent and respond to natural hazards. This strategy is city-wide and underpins a number of other spatial strategies, particularly in high risk areas.

Natural & Cultural Conservation Strategy

Natural and Cultural Conservation Strategies address heritage through an environmental and socio-economic lens, considering architecture, urban morphology, and landscaping to promote certain employment sectors, provide platforms, spaces and programming for diversity inclusion practices, and promote education and capacity-building for natural resource management.

Agricultural & Food Supply Strategy

This strategy tackles food security, supply chains and inflation, to improve resilience to a number of factors including conflict, natural hazards, climate change, and socio-economic change. A legislative adjustment of land-use zoning and/or land-codes is necessary to support the outcome of this strategy.

Basic Service Provision Strategy

A Basic Service Provision Strategy is congruent with ensuring basic human rights are met in a city, supporting governments to supply existing and future populations with adequate and equitable electricity, water and sanitation services. This strategy comes hand-in-hand with financial planning, maintenance and management frameworks, capacity-building, and community engagement. It requires a city-wide, integrated approach, whilst ensuring local specific needs are met.

Resilient Streets Strategy

Resilient Streets Strategies encompass a number of other concepts, principles and actions, and involve the active and on-going participation of local and city-wide actors and community members. Resilient Streets include the 'Complete Street' concept, where all modes of mobility are accounted for in an integrated approach, prioritising pedestrian and cycling infrastructure. This strategy promotes safety (for all, with an emphasis on universal design standards, prioritising women and girls, older persons, and those with disabilities), green spaces (for shade, natural solutions to heat island effects, hazard and climate change mitigation), mixed-uses, economic opportunities, and active, human-scale active facades.

Fig 13. The area of Tem, May 2021

3

ISSUES AND RESPONSES

The six responses outlined in this report are directly aligned to the six key city challenges identified in Khorog with comprehensive analysis, diagnosis assessments, and validated by project stakeholders, technical partners and communities. The identification of each challenge is the result of data triangulation across spatial, socio-economic and institutional dimensions, analysed in the diagnosis report. Any challenge has social, economic and environmental implications that require consideration in the design of priority solutions. A lack of urban management and gaps in legal and institutional frameworks exacerbate existing challenges that may be physical or infrastructural in nature.

The six strategic recommendations were identified to respond to these challenges and provided a framework from which to develop both strategic level solutions (the eight Spatial Strategies) and systematic actions (the Action Plan). The responses, or recommendations, include spatial, legal, institutional and socio-economic dimensions to address each challenge in a comprehensive manner. Each response is first broadly defined, before it is further developed into a more detailed description and spatially contextualised in the Action Plan.

3.1. ISSUE 1: URBAN EXPANSION IN HAZARD ZONE

Khorog, like other mid-sized cities located in mountainous regions of Tajikistan, is challenged by a shortage of land that can support development to accommodate population growth. A lack of opportunities for people to settle within the current built-up area and concomitant lack of regulatory mechanisms to limit urban expansion into dangerous zones has resulted in settlements being built in areas prone to hazards.

By overlaying critical data sets, such as a population density heatmap and the total area affected by a hazard of any type or intensity, seven areas were highlighted as requiring major interventions, both legislative and design-based. These 'priority' areas are Sharifobod, northern Saifullo Abdulo, Khufak and northern Kichordev, northwest Khorugi Bolo, Imomobod, northern Valdosh Gulmamad and Chukht-Khorog, and the western part of Gulobod. All these areas have a relatively high population density, in an area that experiences a high concentration and/or high intensity of hazards.

Based on the City Profile Part 2, three neighbourhoods are identified as the highest risk areas in the city. These are Khufak, northern Khicordev, and Imomobod, which collectively host a total of 2,558 people. In addition to the threat from hazards, these three areas also suffer from poor connectivity with the rest of the city, and low provision of social facilities and utility networks. These deficits, combined with a weak agricultural sector and challenges in food supply, can pose risks to food security in cases of emergency.

A lack of legal mechanisms to limit slope encroachment, coupled with a lack of environmental protection policies, has also resulted in the degradation of natural habitats and impacted native species. Environmental degradation is a critical issue that can impact the ability to attract tourism. Degradation of the natural environment in Khorog and its surroundings will negatively affect the local economy and further, impact regional development.

A deficient system for state-led emergency response coordination and for information and data sharing to predict and support households at risk, exacerbates the challenge for communities. During a community engagement activity (community gathering on 22nd of May 2021), a participant highlighted the need for psychological support for communities residing in risk areas. The psychological and sociological impact on communities and their members is caused by the sense of uncertainty, that relates not only to the risk posed by hazards, but also to the lack of clarity on government actions and responses (please find additional information regarding community activities and outcomes in the subsidiary Community Engagement Report). The potential for relocation is always present, yet the processes through which this may occur, where the resettlement site may be located, and what conditions or services these new sites might provide are not clearly predetermined.

The lack of clarity surrounding governmental plans for the future of those areas and potential resettlement was confirmed by the Capacity Needs Assessment survey (see Capacity Development Report). In response to questions about construction limitations on the basis of hazard analysis, 46 per cent of respondents indicated their belief that only a limited number of areas at risk from hazards are protected (no development is permitted). 23 per cent believed that at-risk areas are not accounted for in any urban plans.

Although the relocation of at-risk populations is supported by specific legislation (Bylaw: Regulation of the procedure of household resettling from environmentally hazardous zones of the Republic of Tajikistan dated November 9, 2000, No. 467.), the operational mechanisms through which these processes might occur are not made legally explicitly. As a consequence, people may be re-located to areas that are threatened by similar risks, or areas without adequate housing, or economic and mobility infrastructure to support new communities. Moreover, communities are not consulted during the resettlement processes, which often leads to a number of individuals returning to previous sites in hazardous zones.

A lack of strategy and coordination to guide city-wide development has resulted in the development of location-specific, isolated projects, as opposed to integrated, sustainable development that responds to both local and city-wide dynamics, while setting priorities to address more urgent needs of select communities. An example of this is the city extension project in Tem, which is also prone to flooding. Urban development beyond the current built-up area, without adequate urban infrastructure, promotes urban sprawl, which will carry negative ecological and economic implications. The land allocation in a hazard area will contribute to the security threats that are already a major community concern. The lack of clarity on future scenarios creates the aforementioned sense of uncertainty and concern regarding evictions, and negatively affects the psychological and sociological condition of the community and its members, as identified during the community engagement activities.

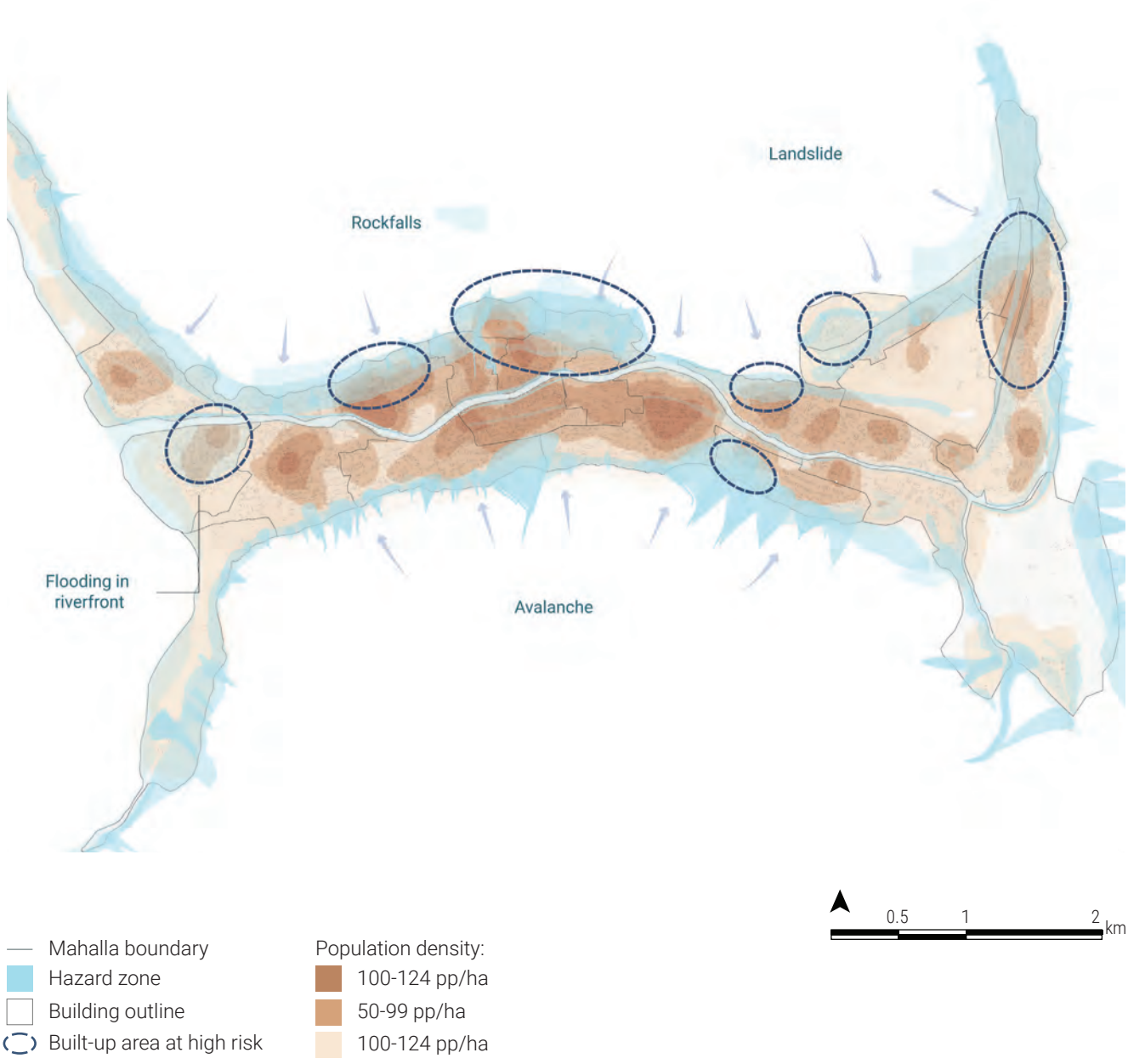


Fig 14. Urban Expansion in Hazard Zone

3.2. RESPONSE 1: GROWTH RESTRICTION AND HAZARD MITIGATION

3.2.1. Spatial Dimension

In response to urban expansion in the hazard zone, several planning tools should be applied in a comprehensive **Growth Management Strategy (GMS)** that will guide development in a coordinated manner. The GMS can be employed by a variety of actors, guided by the local government.

As a part of the GMS, the introduction of an **Urban Growth Boundary (UGB)** is recommended to prevent city expansion into the hazard zones and should comprise multiple planning principles:

- Placing a limit on urban development outside the boundaries (zero development in areas prone to hazards);
- Promoting the efficient use of land, public facilities, and services inside the boundary (when complemented by supporting strategies);
- Encouraging sustainable growth within urban limits in more mixed-use, walkable, affordable, and thriving neighbourhoods;
- Safeguarding the natural environment (vegetation, slopes) from urban sprawl.

Beyond the prevention of development in dangerous areas, the key outcome of the UGB will be the consolidation of the current built-up area by promoting development within. This will create a more sustainable, compact, and functional urban form (see section 1.4), reducing extension and maintenance costs of utility infrastructure such as water, sewerage and roads. Implementation of the UGB also entails environmental and climatic benefits, which will positively support the conservation of natural assets in the region.

The establishment of the UGB defines two zones of interventions.

1) Red zone – covering areas at major risk (beyond the UGB);
2) Yellow zone - covering areas at risk within the UGB.

Each zone corresponds to a set of interventions that will support the implementation of the UGB and, thus, the major guiding GMS.

In general, the legislation of the Republic of Tajikistan does not enshrine the concept of the UGB in the form described above. However, Article 51 of the Town Planning Code stipulates the consideration of built-up to undeveloped territory ratio in settlements as a part of the General Plan. Thus, though the concept exists in the legal documents, more explicit outlines are required.

Red zone interventions – Relocation

In addition to their major hazard susceptibility, the identified red zones present the largest challenges to connectivity in the city. These areas, namely the Khufak, northern Khichordev and Imomobod, already provide the lowest levels of accessibility to both social facilities and utility infrastructures, due topographical challenges and their remote locations.

The proposed red zone restrictions or stipulations are summarised as follows:

1) Zero new buildings: The authorities should not give any permit for new buildings or open any land for construction within the area.
2) No housing extensions: The authorities should not allow for existing house expansion, nor for the construction of additional structures inside the existing lands/garden. This should continue to apply after original occupiers have been relocated.
3) Relocation: in conjunction with the prevention of new construction in the red zone, a relocation strategy is recommended to provide people living in hazardous areas with alternative solutions for housing. However, the relocation process must be well-defined and managed as a long-term policy, with the direct and long-term participation of all community members/households. This should be built upon a human-rights based approach, with the goal to provide affordable and adequate housing for all. Participation should follow international protocols, templates, and guidance related to stakeholder consultation (such as the Meaningful Stakeholder Consultation developed by Inter-American Development Bank), establishing a two-way dialogue and engagement process, rather than a one-way dissemination of information. The consultations with the population affected by the resetlement actions should be included throughout the entire project cycle, following the Human Rights Principles.

Following the implementation of the above three 'Red Zone' interventions, the land use categories of the affected areas must be changed in regulatory plans to prevent any future encroachment. It is also suggested that afforestation of these areas with native and economically productive species can help hazard mitigation, contribute to the ecological health of the city, improve livelihoods and reinforce the prevention of new construction.

Fig 15. Ruins of a house in Nivodak, May 2021

Yellow zone interventions – Hazard Mitigation & Prevention

As in the Red zone, any further construction and housing expansion beyond existing structures should be prevented in the Yellow Zone. However, these areas are well connected to the city and provide a relatively good level of accessibility to social facilities and utility infrastructures. A large-scale relocation process from such well-integrated areas would not be appropriate. Instead, the existing structures can be protected from hazards by increasing mitigation measures.

To ensure the resilience of structures to hazards, it is recommended that hazard mitigation be improved with the implementation of rockfall barriers, catch benches, piles and retaining walls, afforestation and bioswales. In addition, it is recommended that riverbed erosion be mitigated to minimise the potential for flooding within the city.

Promoting increased absorption capacity across the urban surface with integration of context-specific vegetation, construction of bioswales and raingardens (see section 5.2) increases resilience within the city boundary (within the UGB). Such nature-based methods simultaneously create more urban green spaces which assist the revitalisation of the current ecosystem.

These urban design recommendations comprising physical structures, vegetation, and riverbed reinforcement constitute a “hybrid” approach, reducing hazard risk in the urban context by integrating blue, green and grey infrastructures.

To support the GMS, additional primary strategies should be established to consolidate stakeholders (private sector, academia, all levels of government) in such a manner as to coordinate different workstreams. Among them:

- Natural Conservation strategies should be established to preserve the natural habitat, especially outside the UGB;
- Agriculture and Food Security should be strategized to enhance planning for a strong agricultural base with a focus on local food production. It is especially important to ensure supply in cases of emergency. It is suggested to explore the revitalisation of agricultural areas in Khufak, Markazi, Andarsitez and Gulobod once irrigation channels are restored. The fertile land in Dashti Poyon and Nivodak is not fully utilised due to the proximity to the Afghanistan border and related security concerns. Considering the long-term strategic vision linked to monitoring the security situation in Afghanistan, this could open up these lands to be reserved for agricultural use. The area of Tem does not carry the same complex security concerns and therefore, should be considered within a shorter time frame as an area for the introduction of agricultural uses and conservation due to the abundance of water and flat, fertile land.

Fig 16. A house under construction in the hazard zone, May 2021

3.2.2. Non-spatial Dimension

In addition to the recommended major spatial interventions, adjustments to the current regulatory mechanisms are advised to ensure strategy implementations are enforced. Development of the Climate Change Law will reinforce the proposed strategies and consolidate the efforts of all stakeholders around specific challenges that contribute to climate change.

Raising awareness of climate change by means of joint activities of the state and (non-governmental) civil-society organisations will ensure that the reasons for the introduction of relocation strategies and restriction measures are understood by local communities. Simultaneously, development of information systems and training activities to build awareness among stakeholders is necessary.

More importantly, current legislation should be expanded to ensure that hearing and upholding the interests of communities, including on issues of resettlement, is mandatory. As was identified during the workshop, a mandatory participatory approach is crucial to decision-making of this nature. It is recommended that regular consultations are conducted with the communities and Mahala chiefs are empowered by including them in the revision of critical documents related to climate change and urban development.

As several at-risk areas are not currently considered as in need of relocation, an effective government-led Disaster Response Management Programme should be implemented, providing technology, tools, and best practices applicable to the context to support disaster response actors (local government, AKAH) in the collective management of information and coordination of effective disaster responses. As a priority action, the early warning system should be improved. As it was identified in the Capacity Needs Assessment survey (by 84 per cent of the respondents), Khorog does have an early warning system in place but there are deficiencies that warrant improvement. Establishing a dialogue between local government and volunteer organisations in Khorog, which are very active in disaster response and mitigation, is crucial. Leveraging the best practices and experiences of such organisations is recommended.

As identified during the community engagement session, people residing in the at-risk areas require organised psychological support. This could form part of a **Coping Programme** that complements disaster response management. Strong and inclusive communication on a disaster response plan should be provided in conjunction with psychological support for communities at risk.

The Tajik legal framework includes the Law on Migration of 1999, which incorporates the concept of 'environmental migrants', and the Regulation of the procedure of household resettling from environmentally hazardous zones of 2000, which outlines the relocation processes.

RESPONSE 1

HMS GMS AFS

Prevent any new construction, housing/plot/garden extension (yellow and red zone)	Develop agriculture and revitalise tree plantations	Install hazard mitigation for landslides (tree planting, formal mounds, trenches)
No renovation of existing structures (red zone)	Design and install hazard mitigation measures to prevent rockfalls, introduce protective measures and stabilise the current condition	Design and install hazard mitigation measures to prevent avalanches, static defenses and vehicle warning signs in avalanche paths
Implement measures for conservation of land and plant species within land outside UGB	Install hazard mitigation for undeground flooding	Install hazard mitigation for debris
Gradually relocate people from the hazard zones	Install hazard mitigation for overground flooding	Improve hazard mitigation for riverbed erosion

Fig 17. Response 1 - summary of actions

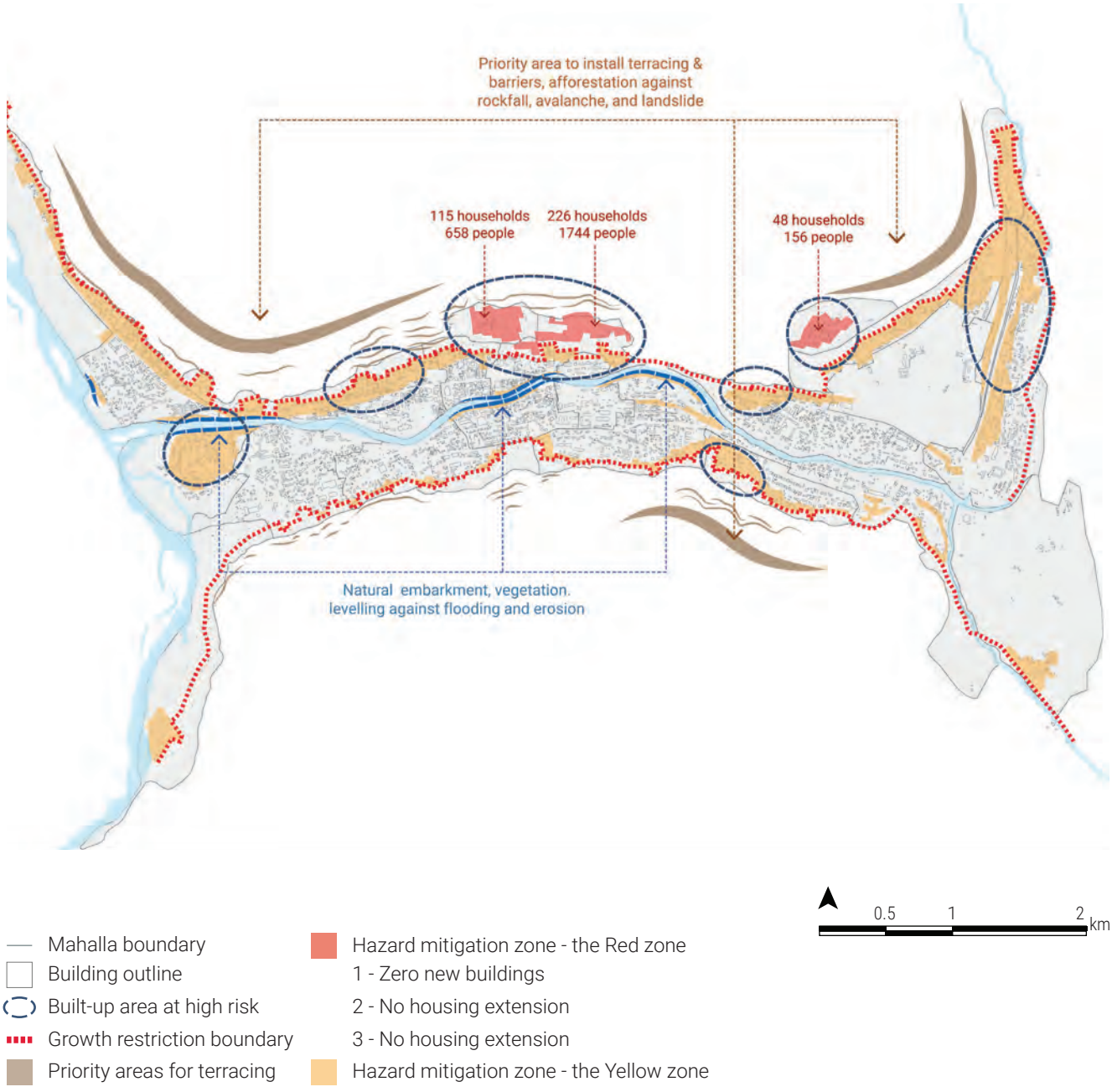


Fig 18. Priority areas for intervention

3.3. ISSUE 2: UNDER-USED LAND

Limited availability of suitable land for development and the lack of an integrated vision to accommodate the growing population in the future city are the root causes of urban expansion into hazard zones. The perceived scarcity of land suitable for development was confirmed during the workshops ("Understanding the City Workshop" and "Diagnosis Workshop") conducted in during the two missions to Khorog and was ranked the 5th highest in prominence of all challenges faced by the city that were identified in the Capacity Needs Assessment survey.

"Land suitable for development" is often considered in terms of "vacant land", however, it is suggested that the focus shift to further consider "under-used land". This will provide more detailed spatial accounts of the city in land studies and categorisations. According to the data studied (open-source data, google satellite imagery, data provided by AKAH) and field visits, under-used areas are predominantly titled for private use, with partly functioning or abandoned structures and/or areas free from development, some of which are located in the hazard zone. Some of these plots present limitations to future development (e.g., topography). Notwithstanding the perception of land scarcity in the city, a study conducted during the first phase of the project indicated that the total amount of underdeveloped land within the boundary of all mahallas amounts to 92.8 ha, (31.3 ha of which consists of industrial sites and 61.5 ha of which consists of under-used lands without infrastructure), which constitutes nearly 23 per cent of the total urban area.

Such a volume of under-developed land within the current urban area can be a significant asset to accommodate the growing population. These lands can also be economically activated with mixed-use development, however, there is currently no strategy to spatially and economically integrate this land into the functioning city. The lack of vision for the efficient use of available land and existing service networks within the city contributes to the development of independent, isolated projects, that encourage unsustainable sprawl. An example of this is the city extension project in Tem. Without an appropriate strategy for integrated, city-wide future development, these projects will further contribute to the fragmentation of the urban fabric and exacerbate challenges in basic service provision and accessibility across the city.

Under-used land often contains structures that are either abandoned or not maintained such as the old bread factory in Barakat. Disused or degraded buildings negatively affect the local economy as they lower the value of nearby land and make it less attractive for potential investment, which is a critical consideration for long-term planning. A strategic vision for underdeveloped/unused areas that accounts for their significant potential to solve housing shortages and contribute to the city economy, will be an essential component of a comprehensive economic strategy for the future of the city.

The long-term presence of vacant land and abandoned structures also affects quality of life in the city as they degrade aesthetic appeal and generate safety concerns. Abandoned spaces often form urban pockets of crime due to poor visibility and low activity. This is of special concern for children in neighbouring areas that lack child friendly public spaces and, therefore, rely informally on these areas. Though 53 per cent of respondents who participated in the Capacity Needs Assessment survey believe that people feel safe in the city at all times, 31 per cent stated that there are isolated pockets of crime in the city, and 15 per cent of respondents have security concerns about several neighbourhoods.

Finally, the presence of abandoned areas within the urban fabric negatively affects the perception of the urban environment and, thus, people's attachment to the city. The physical characteristics of the environment are among the key elements that form the city's identity, and aesthetic appeal is necessary for the promotion of economic activities and community resilience. Several areas have been identified that could be enhanced with urban design interventions to contribute to the identity of the city and activated as new economic nodes.

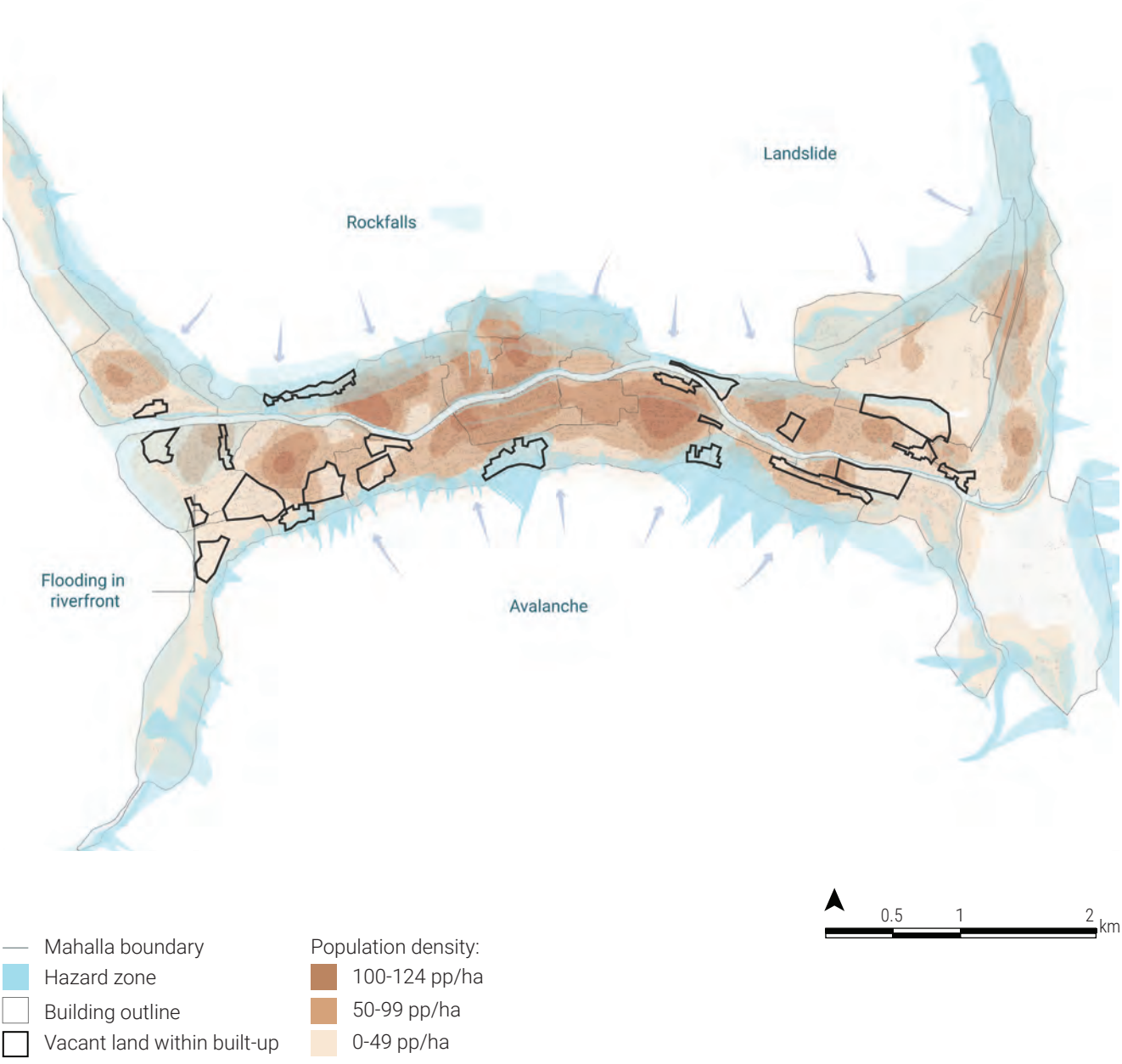


Fig 19. Limited Under-used Land

3.4. RESPONSE 2: REGENERATION & UTILISATION OF UNDER-USED AREAS

3.4.1. Spatial Dimension

In response to the limited supply of unused land that is suitable for development within the city, it is suggested that several plots of under-used land can be considered for urban regeneration projects and promotion of mixed-use development.

During the analysis of open-source information, provided data, and field visits, several plots of underdeveloped land were identified within the built-up area and further classified into two categories:

1) **Category A (zone 1):** Land for potential mixed-use development, located in the areas free from hazards in Tabobatkhona, Barakat, Khorogi Bolo (small plot), and Andarsitez;
2) **Category B (zone 2):** Land for other uses, primarily for public space development (with focus on hazard mitigation as some are at risk) in the south of Dashti Poyon, north of Saifullo Abdulo, several areas in Sharifobod, north Nivodak, south Tabobatkhona, Barakat (area close to the riverbank and a plot in the southeast), Tirchid (three areas), Khorugi Bolo (two plots), a stretch of land in the north of Gulobod, south Chukht Khorug, the area south of UCA.

Category A land (suitable for mixed-use development) amounts to 31.3 ha, which comprises 8 per cent of the total urban area of Khorog. If an urban density equivalent to the maximum number found in the centre of Khorog (125 pp/ha) were to be applied to this land, it could accommodate 3,912 people. However, if the UN-Habitat recommended figure of 150 pp/ha is applied (as per UN-Habitat New Strategy of Sustainable Neighbourhood Planning, Five Principles), this land could accommodate 4,695 people. Therefore, if efficiently planned, this land will provide more than enough space to accommodate the 2,558 people currently residing in areas at risk areas, proposed for gradual relocation. If these recommended densities were applied and this land within the built-up area efficiently used in this way, the figures achieved would mean that 8 per cent of the total urban area could accommodate nearly 13.5 per cent of the current population of 35,000 people. The location of these areas would also provide their potential population with improved access to services and urban infrastructure.

It is proposed that strategic regeneration following the recommended density indicators be applied to selected major nodes in order to define mixed-use, urban centralities that would ensure balanced and efficient development for smart growth in Khorog. The three areas of underdeveloped land in Tabobatkhona and Barakat are suggested as priority pilot sites for the regeneration strategy, to provide alternative housing options for people residing in the areas most affected by hazards - Khufak, north of Khichordev and Imomobod.

In order to unlock the significant potential held in Category A land, some abandoned structures (such as warehouses and/or the hangar complex) can be transformed and repurposed into urban greeneries, sheltered community gardens/areas for urban agriculture and/or flexible spaces for gatherings. It is suggested that a quality assessment of these areas and remaining structures is conducted to address their potential future during the participatory visioning sessions with residents, local entrepreneurs, artists and other stakeholders during the further phase of the project. These sites can be the drivers of the regeneration process, showcasing how the design principles can be applied in the existing context.

Mixed-use neighbourhoods that are planned according to community needs, following the principles of sustainable development, will shift the current trend of scattered high-rise construction to one of compact human-scale neighbourhoods, referencing traditional architectural forms, encouraging economic and social interactions. Traditional architectural forms are still appropriate in many ways for earthquake resilience, heating and cooling, and are still relevant to Pamiri identity. Promoting such trends will address the major community concerns regarding the utility and safety of high-rise development in Khorog. As it was identified during the “Discovery and Understanding” workshop and further confirmed by the community during later activities, people are concerned about their safety and doubt the appropriateness of high-rise buildings in the earthquake prone area.

The promotion of mixed-use, compact development and application of recommended densities will increase the number of people with access to services such as schools, kindergartens, and health facilities, improve connectivity and, thereby, reduce the need for private vehicles, promoting viability for walking, cycling and public transport use.

As was identified during the community engagement gatherings, a number of real economic opportunities are present in Khorog, including in tourism, promotion of local culture in the organisation of cultural events and festivals, local production such as herb cultivation, development of traditional medicine and fishing. These opportunities should be enhanced and supported by urban design interventions, including increased shared spaces for community gardens/farming, coworking spaces for handicraft production, tourism facilities, etc., (please see the chapter 1.5.4 for more detail).

During the community engagement gathering and "walking and talking" exercise, the community expressed their perceptions of the urban environment, indicating the importance of elements that promote cultural identity. This must be acknowledged in new development on under-used land with housing options that reference current traditions and lifestyles.

Category B areas (suitable for public spaces) should be utilised to contribute to the city and community with the provision of long-term or interim services such as community gardens, recreational areas, etc. Once integrated with the wider city, these areas can function as part of the city's green infrastructure, which may encourage behavioural changes to prioritise cycling and walking. During the community engagement sessions, it was suggested that parents would allow children to cycle once the proper infrastructure is in place.

As some of these spaces are prone to hazards and located in the yellow zone within the UGB, hazard mitigation should be considered in their design. Some of these spaces can significantly contribute to urban resilience, for example, with afforestation in the north of Saifullo Abdullo and water retention spaces in the west of Sharifobod and Tabobatkhona, to prevent urban flooding. Several of these under-used areas should function as open spaces to increase the absorption capacity of the urban surface area, providing natural solutions to environmental challenges such as flooding, and contributing to the environmental resilience of the city.

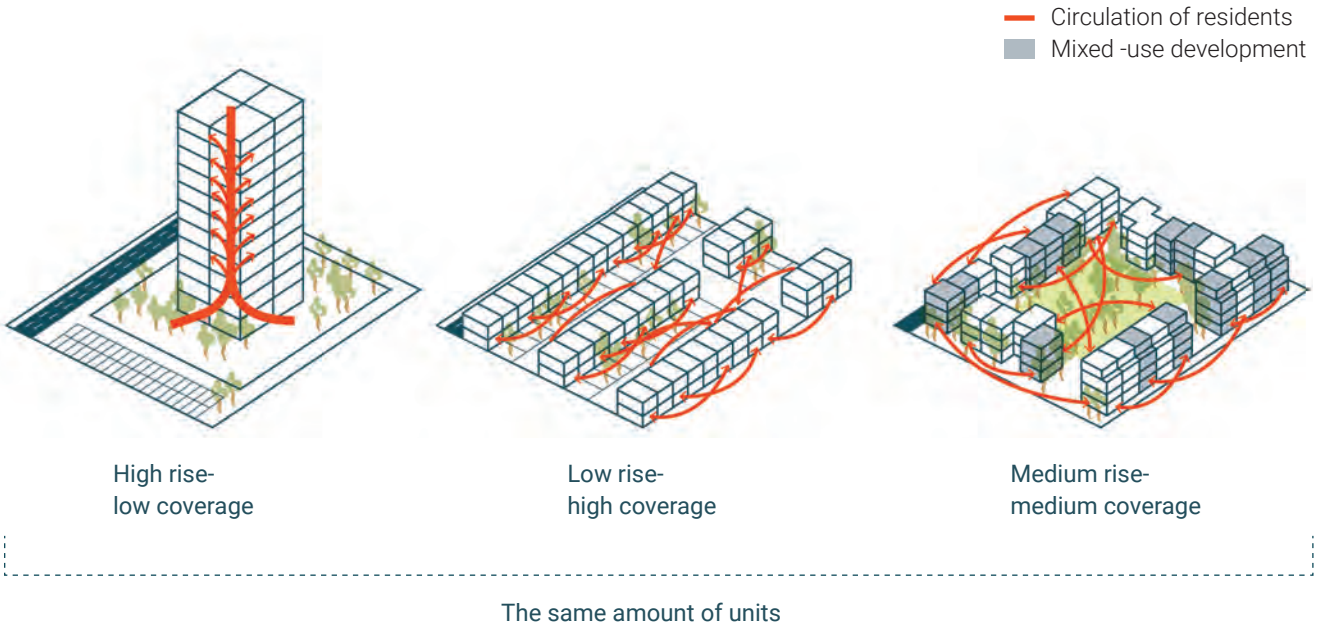


Fig 20. Massing and circulation illustrations of high rise, low coverage development, low rise, high coverage development and medium rise, medium coverage development.

3.4.2. Non-spatial Dimension

As it was identified during the diagnosis workshop, the lands identified for urban regeneration (category A) are titled for private use. The application of an Integrated Capital Investment Plan (ICIP) and financial strategy during the second phase of this project will address land ownership by showcasing the potential value-return for investment in those areas and outlining financing mechanisms with public-private partnerships.

Before an economic model is developed for these areas, it is recommended that a common vision for them is established among a range of stakeholders, including landowners, local government and the communities from both neighbouring areas and priority areas outlined in the Adequate Housing and Relocation Strategy. As a next step and prior to the ICIP development, It is critical to focus on the organisation of joint participatory sessions with the identified stakeholders to establish the future vision for these lands as competitive offering potential for adequate housing provision for communities affected by hazards, and a number of economic development strategies focused on creating jobs, generating tax revenue, improving infrastructure and attracting visitors. Participatory sessions should form the primary phase in plans for relocation.

Not only must legislation impose the participatory process in both the Regeneration and Housing Strategies, it also is important to adjust the current legislation to remove contradictions regarding the choice between market value compensation or provision of alternative land for those affected in the event of removal.[i]

i For more information regarding legislative adjustments, please see the supporting Legislative Assessment report.

Revised building codes will support the implementation of the sustainable neighbourhood concept, once approved. Despite the fact that some of the principles of sustainable development appear in the current legislation, revision of the current urban design regulatory mechanisms is advised to ensure the suggestions contained in this report designed to guide housing development and integrate resilience strategies into urban design (see section 5.1) are fully supported.

The political will to consolidate the population within the safe, serviced, and accessible areas of the city and prevent encroachment into dangerous areas will positively impact the city and the psychological well-being of communities that currently experience stress caused by uncertainty about their future.

Article 77 of the Constitution grants local governments the right to formulate and execute their own budgets and establish local payments, taxes, and duties "in accordance with the law". In addition, regulations on PPPs are outlined in the 2012 law of the same name, which creates the basis for capital investment and cooperation between the private and public sectors.

RESPONSE 2

GMS URS HRS

Promote mix-use, high density (125 people per hectare) development	Reserve land to develop as public spaces with flood hazard mitigation, develop 'sponge' public spaces with context-specific, local vegetation
Activate under-utilised land with mix-use and high density (125 people per hectare) development	Develop and design the slope as a public space (including landscaping/natural solutions to hazards where relevant)

Fig 21. Response 2 - summary of actions

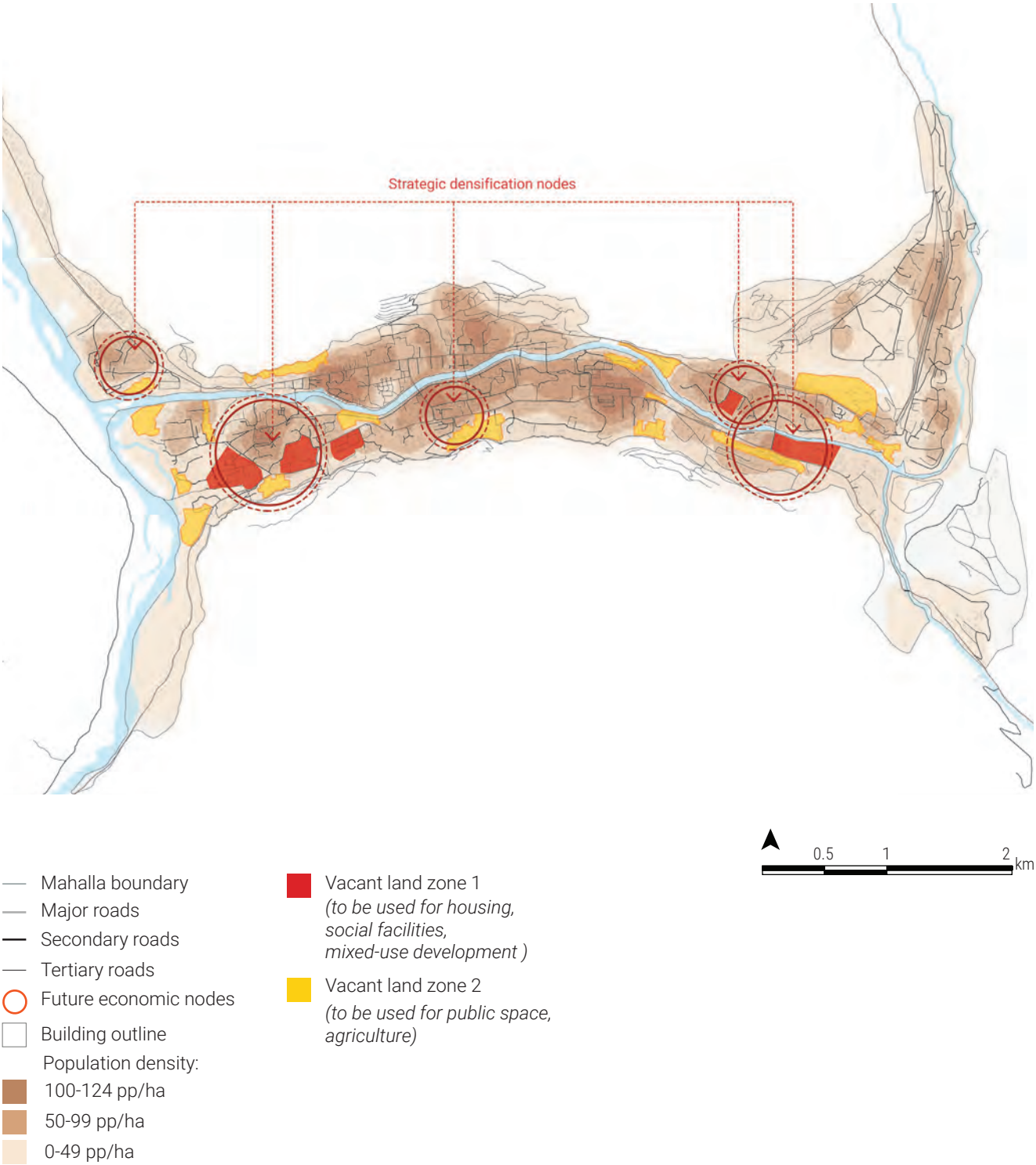


Fig 22. Locations of proposed strategic densification nodes.

3.5. ISSUE 3: FRAGMENTED URBAN FABRIC

The fragmentation of Khorog is caused by a combination of mono-functional land use, urban morphology and low numbers of formal links between the major functional clusters of the city. Interruption of the urban fabric is created by void spaces (such as vacant/underdeveloped land, construction sites or topographic features), and large mono-functional clusters such as Khorog airport, the Military Zone, UCA and the Botanical Garden.

The design of through-routes in a city can either promote permeability or exacerbate fragmentation. Pedestrian infrastructure and safety measures can mitigate the barrier effects caused by wide or high-speed roads. Physical environmental characteristics such as steep hills, rivers and water channels can also be managed to reduce their fragmentary effects. In Khorog, the challenge posed by these features is not merely inherent to their form or position but exacerbated by their lack of design and use, which detaches them from surrounding communities and neighbourhood dynamics.

Challenges to walkability divide the city of Khorog into four fragments, located to the north, south, east and west of the rivers Gunt and Shakhdara. The steep slopes detach Mahallai Khufak, the northern part of Khichordev, and Imomobod from the main urban area, reducing the accessibility of the city's resources and services in these areas and, thus, segregating them from important urban and socio-economic benefits. The slope extending from the territory of the UCA segregates the university from the city, which affects its operational dynamics. The UCA campus functions more as a standalone, single-use satellite rather than an integrated city node. As was mentioned by the UCA representative during the community engagement activity, UCA students and professors do not visit the city and prefer to stay on campus. Despite being a knowledge hub and driver of city development, as well as a potential community resource to extend outside of the student body and faculty, some UCA facilities are not publicly accessible. This makes building interactions with the community challenging, something that is necessary if the presence of the university is to be leveraged for the "University town" vision.

In the area of Mahallai Dashti Bolo, Valdosh Gulmamad, Chukht Khorog and Sultani Valli, a lack of integration strategies for green, blue, and grey infrastructures has resulted in challenges to river access, interruption of the urban fabric, and an increased dependency on car use. A lack of pedestrian linkages and solutions to integrate topographic features into the urban environment has resulted in the spatial detachment of the Botanical Garden from the city. In addition, poor connectivity with the city centre in Tem, by both a pedestrian network and public transportation, is contributing to polarised development, making it difficult for the communities in Tem to engage economically with the city or access services (health facilities, kindergartens).

Spatial fragmentation negatively affects the overall economic development of the city, which is exacerbated by the lack of an economic vision. A more compact urban environment with better accessibility to local services and jobs maximises the economic potential with agglomeration effects. As was identified during the community engagement gathering, despite the fact that several small businesses emerge quite actively (handcrafts, jewellery, clothing, etc.), there are various institutional barriers that make expansion challenging.

A further concern identified during the participatory activities was related to the quality of environment. There are important opportunities to leverage the unique natural assents of Khorog but the current environmental degradation driven by a lack of urban development strategies will negatively affect the economic development and environmental sustainability of the city if no actions are taken.

The three major functional nodes of the city identified as the city centre (Economic node), UCA (Knowledge hub), and the Botanical Garden (Recreational centre), can shape the future development of the city and support a connected system of public spaces. However, if the fragmentation caused by a lack of spatial and socio-economic linkages is not addressed, accessibility can become further limited, car dependency increased, consolidation and growth of economic nodes obstructed, further interrupting the system of public spaces, and mobility and utilities networks will remain dispersed.

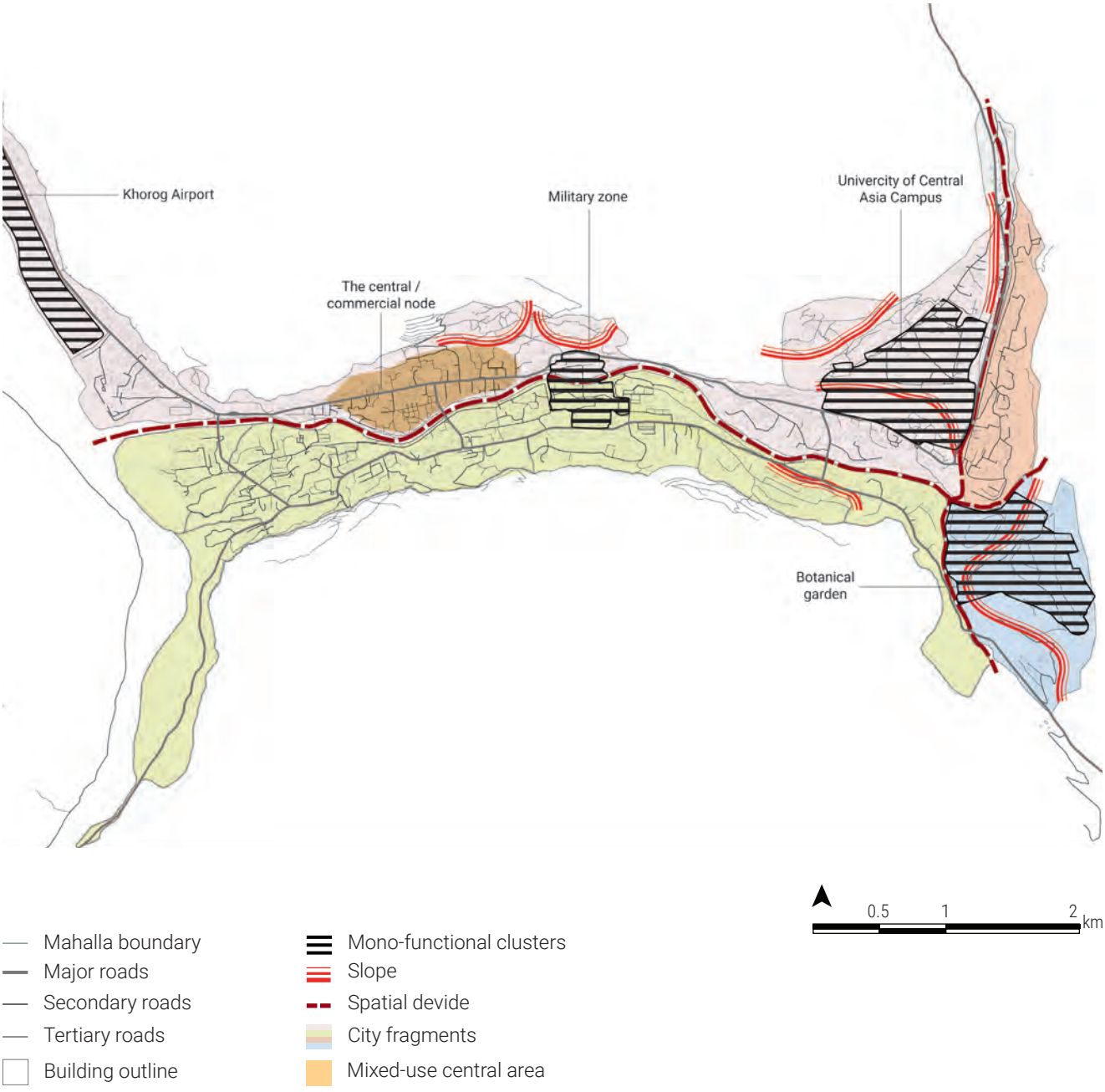


Fig 23. Fragmented Urban Fabric

3.6. RESPONSE 3. MIXED-USED ECONOMIC CENTERS & PERMEABILITY OF URBAN FABRIC

3.6.1. Spatial Dimension

To address fragmentation, the Growth Management and Regeneration Strategies described in the previous chapter will facilitate the process of urban consolidation with sustainable densification. The Regeneration Strategy complements growth management policies, directing urban growth towards increased density in existing built environments, which will lead to more efficient use of existing infrastructure and services, facilitate the creation of a public space network and deliver multiple benefits such as reduced car dependency and reduced public spending on infrastructure provision and maintenance.

However, these nodes of densification must be supported by additional strategies to ensure that they are integrated with the existing networks of the city. For example, providing mixed-use units within each of the strategic densification nodes will rebalance the current economic focus on the city centre. However, this must be accommodated with an interconnected and upgraded street network (this is explored more in section 5.3). This means ensuring that streets are considered a public space, requiring urban design adjustments to promote walkability, and also that economic activities are promoted along the main axis routes.

The core responses to the challenge of fragmentation are as follows:

- Strengthen the southern axis of the city and create a secondary 'backbone': strengthening the southern axis, starting from the planned vehicular bridge in Dashti Poyon to the existing eastern bridge in Andarsitez will balance the economic agglomeration in the city centre. Redesigning the three existing vehicular bridges as connectors between the north and south backbones, a loop to carry the primary traffic (both motorized and non-motorized) will be created. This loop will not only help divert the traffic from the Saifullo Abdulo area and reduce congestion but also provide alternative opportunities for increased economic activity along the route. This will allow the creation of secondary economic nodes and connect regeneration areas in Tabobatkhona and Barakat, Khorugi Bolo and Andarsitez, Dashti Poyon and Nosiri Khisrav.
- Introduce mixed-use units along the city 'loop': promotion of mixed-use development (residential, commercial, cultural, institutional, recreational, etc.) along the primary mobility axes will assist local government in providing walkable, vibrant neighbourhoods with convenient transit and pedestrian linkages, proximity to jobs, access to nearby public services, public spaces and activity-oriented destinations. This will also enhance links with the regeneration nodes on the northern and southern axes. To facilitate the consolidation of the city structure, it is suggested that the following areas are prioritised for mixed-use development:

  1) *Within the selected sites for the Regeneration Strategy, primarily in Tabobatkhona and Barakat, Khorugi Bolo and Andarsitez to establish new major economic nodes, which will foster the further transformation;*
  2) *Around major economic nodes in Dashti Poyon, Nosiri Khisrav, Tem and the city centre to balance the overall development and socio-economic interactions within Khorog. To increase mix-use development in these areas it is suggested that land use diversification is introduced. The introduction of an Infill Scheme may be also considered for these areas in a further process of city transformation (see the 'Future Scenarios' chapter for more detail regarding land-use diversification and infill).*

- Finally, specific improvements to sections of street are recommended to improve the city's walkability and cyclability with the introduction of specific infrastructure, as well as improvements to pedestrian access on existing vehicular bridges in the city. Redesigning street sections will enhance non-motorized mobility and a child-friendly environment and will improve connectivity and link the fragmented city fabric.

Paragraph 69 of GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements" outlines a mixed land use concept as consisting of residential and public buildings, scientific institutions, educational institutions, business facilities, industrial enterprises and other production facilities etc.

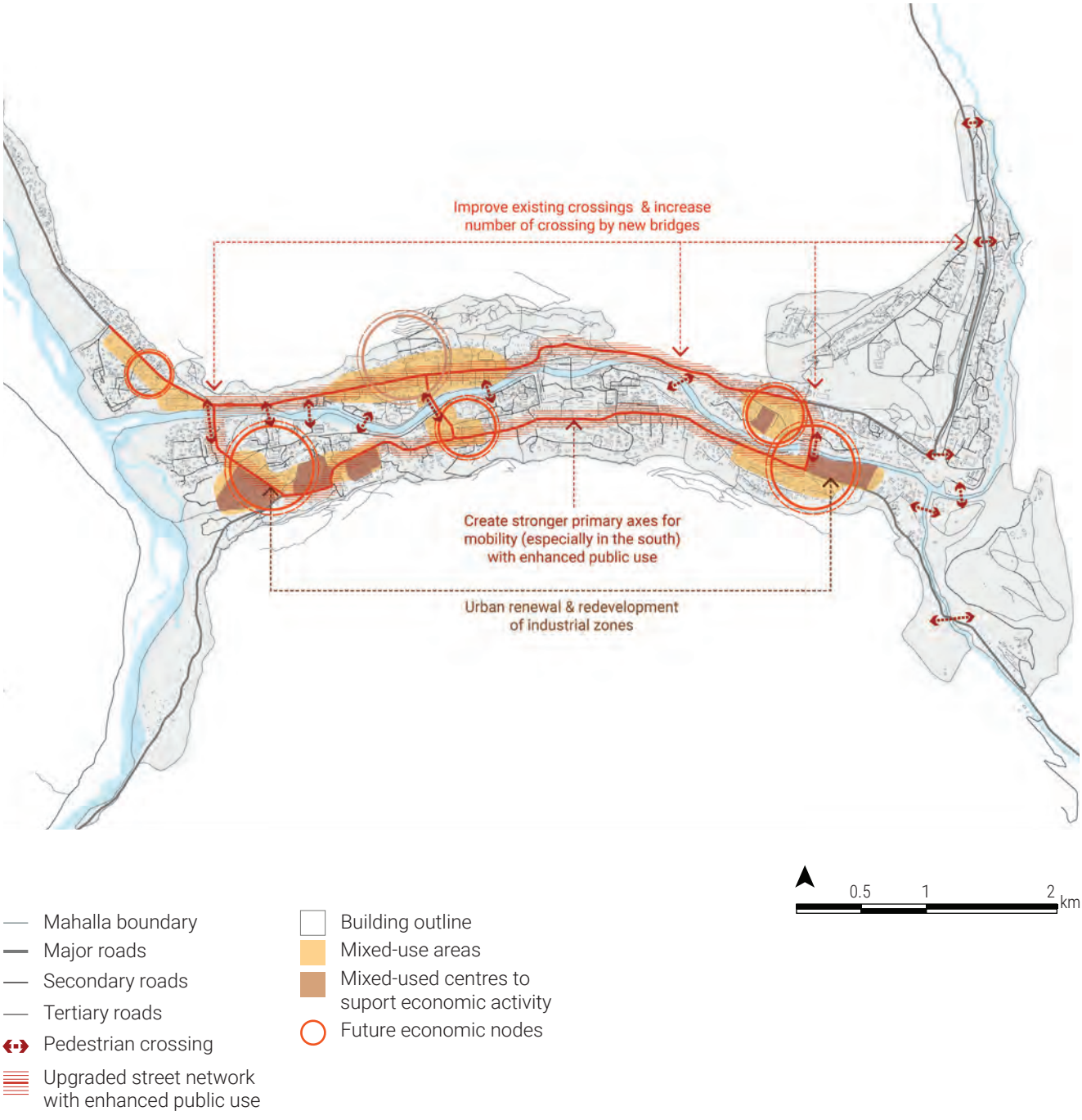


Fig 24. Enhanced connectivity strategy

3.6.2. Non-spatial Dimension

To ensure the successful function of the consolidated city backbone (enhanced activity nodes, mixed-use areas and mobility axes), it is recommended that mixed-use activities are strengthened with the introduction of sectoral economic strategies, that build on the identity and opportunities of the city. According to the Capacity Needs Survey, 53 per cent of the respondents believed that there is very little economic diversity in the city, which has led to limited income opportunities for citizens. To address that, economic diversification should be a priority for future development.

To ensure the comprehensive activation of the tourism sector, it is recommended that an enabling environment for investment is assured. Softening the current institutional regulations to booster the development of small and medium entrepreneurship is suggested. Reactivation of the urban economy will be addressed more fully in the second phase of the project, together with the development of the ICIP and demonstration projects.

Targeted, sector-based investments can link spatial and economic strategies. For example, it is recommended that the following strategies are considered in line with the spatial recommendation to build economic development synergies:

- Development/strengthening of the tourism sector, particularly ecotourism. Activities such as hiking, camping and other nature-related tourism activities could be promoted for which and it is suggested that culture and nature trails be designed through the city, linking significant landmarks such as the traditional Pamiri houses with the public space network.
- Incentivisation of local production such as herb cultivation, development of handicrafts, cultural activities, and the arts.

To reveal and strengthen economic development opportunities, it is suggested that communities are provided with skills training and a wide range of educational programmes in entrepreneurship, with a strong focus on youth. Leveraging the particular demographic situation, characterised by the considerable proportion of young people in Khorog (54 per cent), with additional vocational training and youth centres that can further utilise existing social infrastructure (schools etc), will be an essential driver for the future socio-economic transformation of Khorog.

Alongside the development of additional social infrastructure, it is important to enhance collaboration with educational and research institutes, particularly UCA, to facilitate academic exchange, research development, data production and to promote Khorog as a knowledge centre and university town. It is suggested that steps are taken to increase interactions between UCA and the community such as opening some of the facilities to the public, organising open lectures/talks, awareness-raising activities/campaigns on climate change and popularising science, research and creativity.

As part of the Growth Management Strategy and in addition to Urban Regeneration recommendations, the **Natural & Cultural Conservation Strategy** is designed to improve the overall well-being of residents and address several economic challenges by preserving the unique landscape and local natural assets (topography, vegetation, natural habitat, etc.) to attract tourism.

The complementary Cultural Conservation Strategy is designed to protect traditional architecture (Pamiri houses), arts and culture through preservation and promotion of local identity (with festivals, public events, etc). Tourism should be considered as an economic development tool, applied to activate multiple production sectors and accelerate overall economic development. A focus on environmental protection in long-term planning can encourage economic growth that is ecologically sustainable.

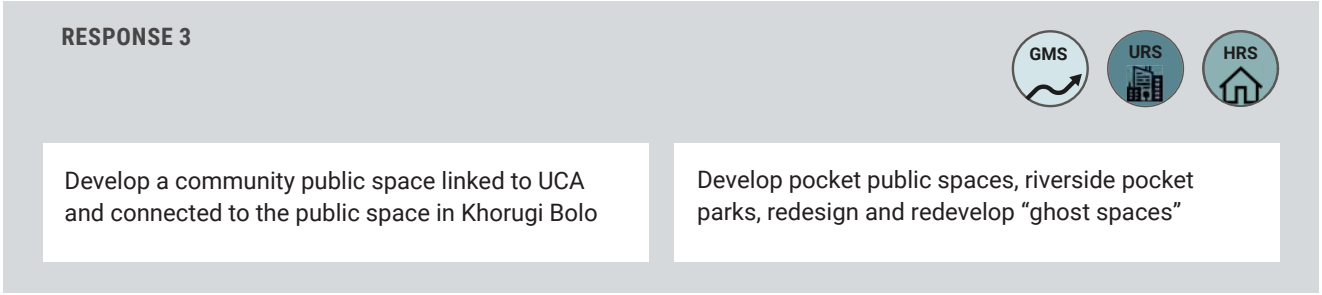


Fig 25. Response 3 - summary of actions

Fig 26. Area of the former bread factory, May 2021

3.7. ISSUE 4: CAR DEPENDENCY AND LACK OF PEDESTRIAN LINKAGES

Building on fragmentation in Khorog, the fourth consolidated challenge highlights the lack of connectivity in the city, which has created car dependency that negatively affects the natural and socio-economic environment. The lack of pedestrian linkages and poor quality of pedestrian infrastructure, particularly pedestrian bridges, makes walking across the city challenging. This exacerbates car-dependency. Two bridges in the city centre fall within a military zone, meaning that they are not publicly accessible. East of this point, there are no pedestrian bridges, leaving weak connectivity between the north and south sides of the city in the eastern periphery. This has an impact on resident access to employment and public services, and can hinder emergency responses.

The lack of urban permeability driven by fragmentation, isolates neighbourhoods and results in poor accessibility. Figure 24 indicates (using black arrows) the most time-efficient routes between neighbourhoods, demonstrating the impacts created by low connectivity on levels of access to utilities, health, education, and public facilities as well to centres of economic activity, especially for those in the eastern region of the city.

The accessibility assessment also indicated that the UCA development can provide a high level of access. However, the lack of pedestrian linkages with nearby neighbourhoods and non-spatial access limitations such as the private nature of the institution, negatively impact the potential to integrate UCA into the surrounding city.

The central area of Khorog experiences further challenges, indirectly related to low connectivity. Due to the concentration of economic and administrative functions on Lenin Street, the city centre has been suffering from high traffic loads and congestion. Unregularised parking along the main roads is exacerbating the congestion. Though there have been several attempts to mitigate the congestion such as limiting truck access during the day, additional measures are necessary. An additional proposed action is to redirect truck traffic to the south through the planned vehicular bridge in the west of the city, however, additional infrastructure required to accommodate this traffic has not been planned along the southern axis route.

Despite the good public transport coverage, unregularised stops and an unclear schedule makes the public transport system unreliable. The lack of integrated pedestrian network significantly contributes to car dependency, further reducing walkability in the city. As was revealed during the Capacity Needs Assessment, road quality is a critical issue that also affects the regional connectivity within GBAO.

Although some streets are well adapted to all users (including cyclists, pedestrians, cars), the lack of urban design strategies and maintenance means that most roads prioritise vehicular movement. A lack of regularised parking spaces has resulted in chaotic parking lots, creating difficulties for pedestrians and cyclists. As was identified during the community gathering, children and youth would prefer to use bicycles, but parents don't allow children to cycle due to road safety concerns.

Finally, regulations to protect the riverside from construction have not been enforced, and construction in the area has reduced accessibility to the river. There is, therefore, limited public use of the river and almost no visual connection to the river from within the city. The river's impact on the environment and on the identity of the city, as a landmark for navigation, potential pedestrian link and an opportunity for public space has been directly reduced by this construction.

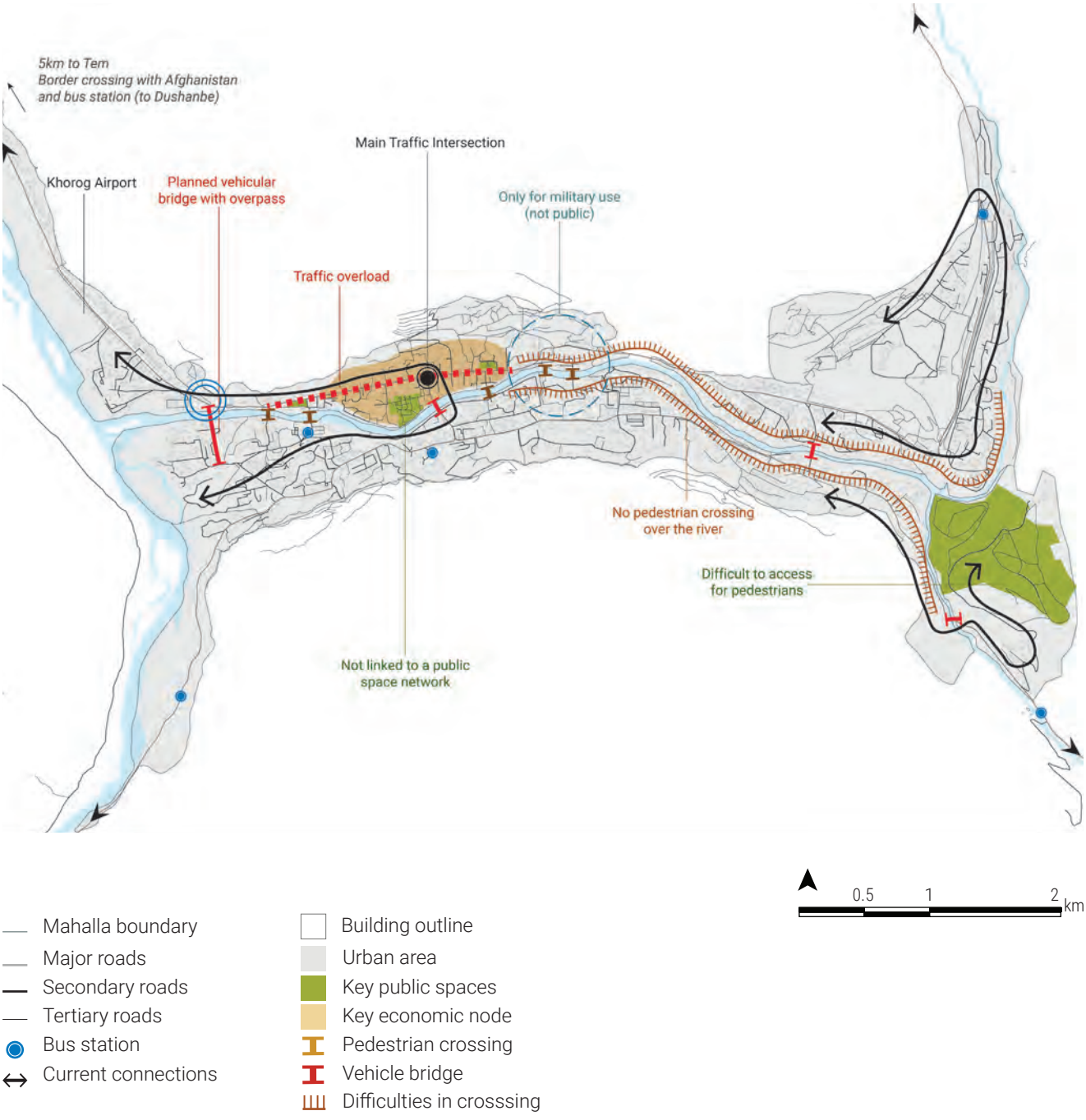


Fig 27. Car Dependency and Lack of Pedestrian Linkages

3.8. RESPONSE 4. INFRASTRUCTURE FOR NMT & PUBLIC SPACE NETWORK

3.8.1. Spatial Dimension

In response to the challenge of car dependency and the lack of pedestrian linkages, actions are proposed to follow the **Resilient Street Strategy**. This strategy promotes multi-modal streets that incorporate walking, cycling and mechanised transit, include elements of green infrastructure, and support surrounding land uses, setting the following major goals:

- Improving accessibility and safety for all street users (pedestrians, cyclists, drivers, public transport users) by providing sufficient infrastructure for a wide range of mobility options;
- Providing an attractive streetscape and variety of public spaces, to increase resilience (by integrating disaster mitigation techniques in public space design), support the functionality of the adjacent land uses over vehicular mobility, and improve the quality of the urban environment;
- Promoting economic well-being of residents and business owners by creating an enabling urban environment for small and medium-sized enterprise and maximising social and economic activities.

A number of actions are suggested that will further contribute to the structural transformation of Khorog into a "Green City". These are as follows:

- Formalise the multi-modal transport infrastructure. This means prioritising cycling and pedestrian mobility over that of cars in infrastructure and design, focusing first on the main axis routes (indicated in green on the map). Enhancing mobility with these design mechanisms, and redeveloping the nodes along the city backbone will encourage the emergence of further economic activity along the core street network. As priority interventions, it is suggested that new typologies of street sections are developed and implemented, to include necessary pedestrian infrastructure (such as sidewalks, crosswalks, curb extensions, pinch-points, etc.) with accompanying design to facilitate movement (such as signage), traffic calming measures, cycling infrastructure (such as protected or/and dedicated bicycle lanes, repair stations, bicycle parking spaces), and public transportation infrastructure (bus stations, dedicated bus lanes). In addition, selected streets (especially along the major axis routes) should incorporate regularised parking spaces.
- Repurpose the under-utilised areas classified as suitable for public space (category B, described in 1.4) to be integrated in an interconnected, city-wide, pedestrian friendly network that links city nodes, landmarks and facilities. An example intervention would be to introduce public space in the south of the UCA campus, which could be used as an activity centre to promote educational and training activities, cultural events and campaigns. Areas of steep gradient can be landscaped as public space, and also provide hazard mitigation. These areas are highlighted in figure 27 and are proposed to be connected by green, landscaped and non-vehicular infrastructure along the main axis routes in the city.
- Once integrated regularisation of mobility modes is in place, it is suggested that improvement and/or revitalisation of the drainage systems take place by promoting vegetation and planting along the streets, using context-specific vegetation with greater water absorption capacity to increase the number of "sponge" surfaces in the city as part of a flood mitigation strategy. In addition, it is suggested that urban design interventions (such as street furniture, shading, places to rest, parklets, etc.,) are promoted to ensure the creation of comfortable and vibrant public spaces. This should serve all street users, regardless of the mode of transportation used, age or ability. It is especially important to ensure that urban design interventions are adapted to the needs of Persons with Disabilities, follow universal design standards, and include necessary infrastructure (such as signage, tactile walking indicators, ramps, etc.).
- Additional pocket parks, specifically connected to the riverfront to improve use and accessibility of the river banks is also recommended. Vegetation in public space not only attracts people to the area, but can also reduce erosion of the riverbank and assist water filtration. Opening the riverfront as public space

can increase community awareness of its importance to the city itself.

- An assessment and mapping of pocket parks according to access, quality and those least at risk from hazards should be undertaken. Due to the risk of damage to roads and bridges during an event caused by natural hazards, identifying open spaces that can have a role in providing emergency gathering points for the surrounding neighbourhoods is important.
- Construction of new pedestrian bridges from Tirchid to Khorugi Bolo, from Andarsitez to the Botanical Garden, from Chukht Khorug to the Botanical Garden, and from the Ismaili Centre (Saifullo Abdulo) to Barakat (highlighted in orange in figure 27), to ensure the greater connectivity between the northern, southern and eastern regions of Khorog. This will impact mobility, service access, and support emergency responses. Pedestrian-friendly infrastructure will encourage walking in the city, with consequential benefits to safety, air quality and congestion.
- Augment vehicular bridges to include pedestrian walkways and create further bridges between Saifullo Abdulo and Barakat, Khorugi Bolo and Andarsitez, and Andarsitez and the Botanical Gardens to balance movement between these areas, limit travel time, and respond to the challenge of urban fragmentation;
- It is also suggested that the initiative to construct the bridge in the West of the city between Dashti Bolo and Sharifobod be supported, which will redirect traffic from the city centre. However, this bridge should be accessible to pedestrians and cyclists, and additional adjustments to the adjacent street section are necessary to accommodate the new traffic route through the south side of the city. These adjustments should include sufficient infrastructure for parking, public transportation, and pedestrian movement.

Fig 28. Pedestrian bridge in the central area of Khorog, May 2021

3.8.2. Non-spatial Dimension

It is important to support the proposed transformations to the physical infrastructure of the city with policies and community initiatives. Though the infrastructure for non-motorised transport in critical, regulations, and cultural and social norms are important to promote use of new mobility modes by all social groups. Cycling initiatives that can be promoted at the city level are suggested for exploration. These could include:

- City-wide events and campaigns such as "Open Streets", that entail temporarily closing a set of streets to cars and opening them for people to cycle and/or walk. This strategy can be used to pilot different routes and paths in the process of street redevelopment and identify priority routes;
- "Safe Routes" and "Skill Training Schemes" programmes, which include education and encouragement initiatives, aimed to increase safety and the number of students walking and/or cycling to school. These should be introduced in addition to significant infrastructural improvement, not considered an alternative action. Targeted cycle training workshops could be conducted, partnering with local volunteer organisations, and UCA in particular, for children and parents designed to improve local perceptions of cycling, educate on safety and sustainable mobility, and to build community linkages. During the community engagement activity these types of initiatives were identified as a common desire in Khorog, with suggested focus on installing shared bikes, mobile bike repair shops and organising bicycle training for girls.
- The system of public spaces, linking key landmarks, economic nodes and activity centres should be considered not only as a network of vibrant city places but of economic and cultural interactions. Fostering social and economic activities and promoting local culture will contribute to the identity of the city, which derives from integration of local values, services, and urban morphology. Promotion of local arts, creativity and culture in public spaces can add meaning and significance for communities and encourage fuller use, and greater appreciation.

Paragraphs 191-192 of GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements" outline requirements for cycling roads along main streets, and in public recreation and green areas.

Paragraph 140 of GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements" stipulates the scalar requirements for water-green systems as ranging in widths of 0.5 to 0.7 km in the central area, 1.5 to 2.0 km in the peripheral zone of large settlements, 0.2 to 0.5 km in large and medium-sized settlements.

RESPONSE 4

HMS GMS AFS

Reserve the land and develop public spaces with flood mitigation, develop sponge public spaces with context-specific, local vegetation	Upgrade vehicular bridges to include pedestrian access: Saifullo Abdulo to Barakat, Khorugi Bolo to Andarsitez, Andarsitez to Botanical Garden	Construct new bridges for both pedestrian and vehicles from Dashti Poyon to Sharifobod
Regularise parking spaces	Construct new bridges only for pedestrian movement: Tircid to Khorugi Bolo, Andarsitez to Botanical Garden, Chukht Khorug to Botanical Garden, Ismaili Center (Saifullo Abdulo) to Barakat (public space)	Redesign the main street to include cycling lanes and pedestrian infrastructure
Install public transport stations		

Fig 29. Response 4 - summary of actions

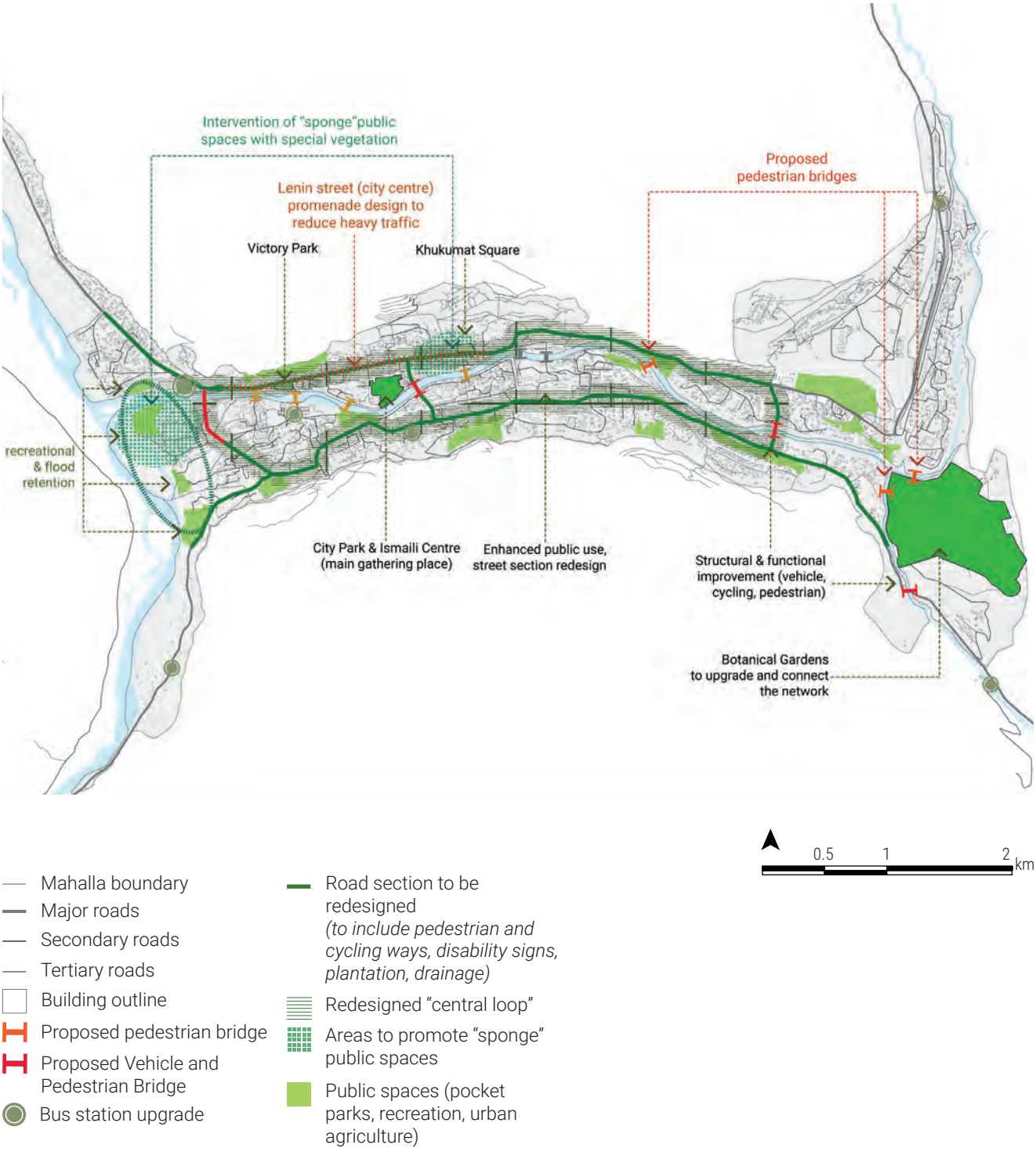


Fig 30. Proposed interventions to increase connectivity

3.9. ISSUE 5: INSUFFICIENT UTILITY INFRASTRUCTURE

The fifth consolidated challenge is the insufficiency of the current water and sewerage infrastructure for the existing population. As demonstrated in figure 29, the distribution of basic services is heavily unbalanced.

The nature of utilities provision is interrelated. Without maintenance, water channels can leak and increase the risk of ground water flooding, which in turn, impacts areas that lack access to the sewerage network and rely on septic tanks. Tem, Tabobatkhona, Barakat, Voldosh Gulmamad and Chukht-Khorug were identified as priority areas for interventions to address this.

Overflowing dump sites in the city, some of which are informal or consist of open pits, cause unsanitary conditions. The city landfill also lacks infrastructure to limit pollution from leaching into the nearby river and water system. The lack of a waste management system means that refuse is not regularly collected and recycling is practiced in the city.

Another critical challenge is the high reliance on informal water access, leaving consumption uncontrolled. Scarcity of employment opportunities make the introduction of utility bills challenging, however, water is regularly over-used. Moreover, the low quality of water pipes and channels requires intervention to reduce leaks, and ensure they can withstand the low temperatures and earthquakes.

Despite insufficiencies in the city water infrastructure, this does not apply to all service networks and the electricity network coverage spans the majority of the city. Although works are being undertaken to improve the efficiency of the electricity network, additional non-spatial challenges remain, such as the need to diversify energy sources and storage to avoid over-reliance on water flow for hydropower. These require addressing to ensure efficient and consistent supply.

An integrated, city-wide approach, that integrates provision of all services is necessary to ensure the entire city is accommodated with household water supply and irrigation, consistent, year-round electricity provision, waste removal, and sewerage networks, the latter two of which are essential to protect the city's water sources from pollution.

Fig 31. Informal connections in Khufak, May 2021

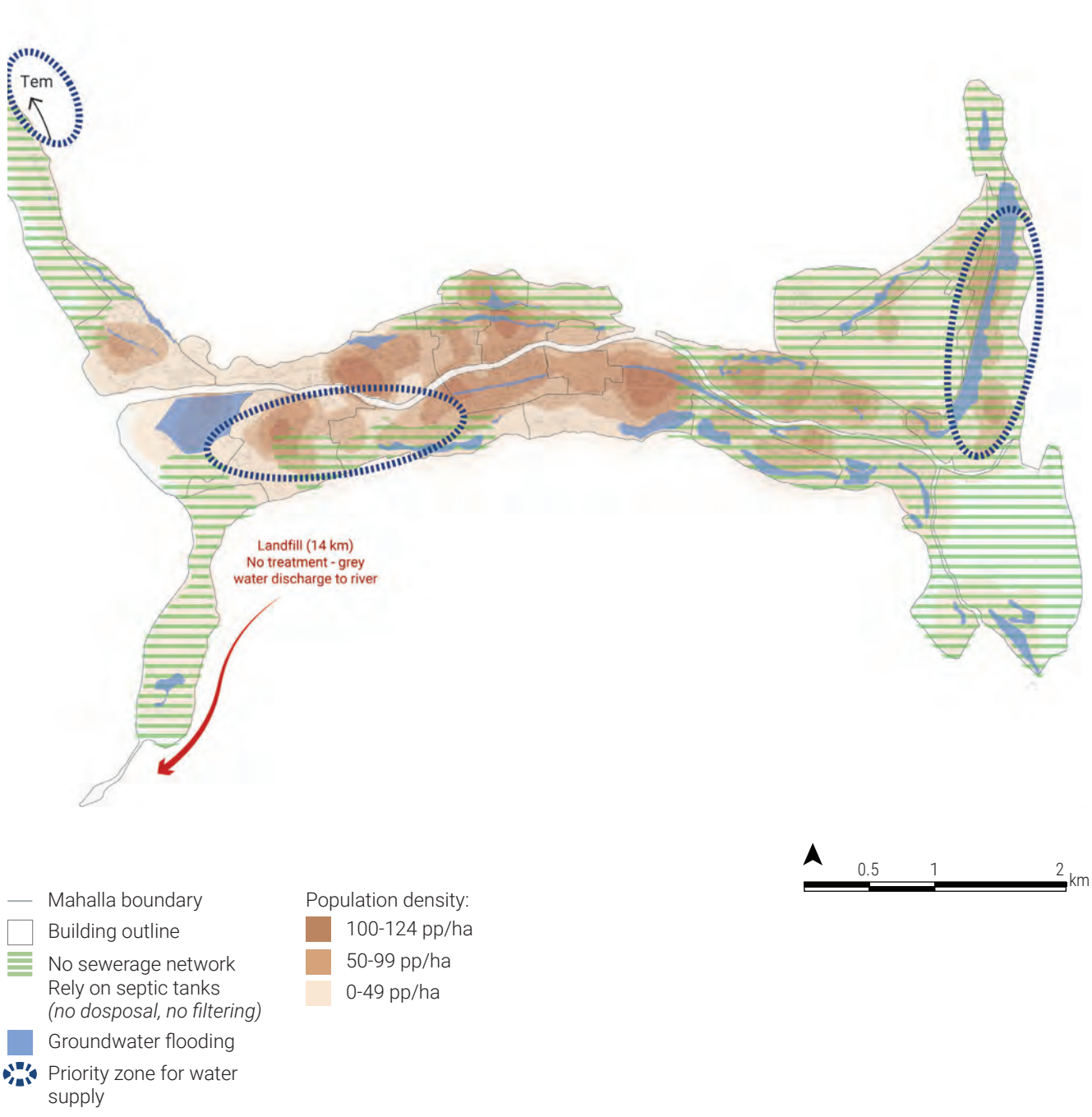


Fig 32. Insufficient Utility Infrastructure

3.10. RESPONSE 5: IMPROVEMENT OF UTILITY INFRASTRUCTURE

3.10.1. Spatial Dimension

To respond to this challenge across spatial and non-spatial dimensions, a series of actions are proposed, that can be applied both to targeted areas and the entire city as part of the Basic Service Provision Strategy.

To address physical infrastructure failings, formalisation of the informal water pipeline connections and their inclusion in an infrastructure and maintenance plan is suggested to ensure equal access and integrated maintenance of the water network across the city. As a priority, increasing water supply to Tem, Tabobatkhona and Barakat, and Chukht-Khorug and Valdosh Gulmamad) is recommended.

Although the identification of priority areas was based on the analysis of field experts and validated with stakeholders, including Vodokanal, a more detailed study should be conducted across all Mahallas with the involvement of the community and Mahalla leaders to ensure a clear depiction of the situation on the ground and full understanding of consumption patterns.

Expanding the water network will involve pipe replacements with non-freeze materials, upgrading areas of the network that are constructed with harmful materials (asbestos), and repairing non-functional sections (in Tabobatkhona and Nosiri Khisrav).

The introduction of utility bills must be implemented only after the water supply is improved and adequate for all. It is recommended that consultative work with the communities and Mahalla chiefs is enforced during the process of utility network formalisation, to ensure that all spatial, economic, and social implications of alterations to the water network are taken into consideration and impact the phasing, costing and maintenance plans for these works. This must be a city-wide and inclusive process, however, it is suggested that water meter piloting could be established in areas of current water abundance, such as Gulobod, Andarsitez and Khorugi Bolo.

Detailed accounts of consumption patterns across Mahallas will ensure the efficacy of a comprehensive city-wide approach to infrastructure revitalisation. It is important to ensure the improvement of the irrigation canals to prevent leaks and blocks. Further, it is critical to separate the irrigation and drinking water supplies for more efficient maintenance.

In response to the low sewerage coverage and reliance on septic tanks, expansion of the sewerage network and improvements to pump capacity will be required. Moreover, it is important to promote the installation of septic tank filtration systems in the areas where the majority of households rely on septic tanks. Finally, the introduction of ‘sponge spaces’ will help to absorb excess water and reduce both underground flooding and the impact of pollution from septic tanks.

As part of the comprehensive approach, it is critical to invest in the construction of a waste treatment facility, isolating the landfill area from the river. Additionally, it is essential to define waste collection points within each Mahalla that correspond to the implementation of a waste collection system, and begin promoting recycling and sustainable waste management practices.

Fig 33. Water channel, May 2021

3.10.2. Non-spatial Dimension

Installation of water meters and establishment of a waste collection system must be supported by legal and institutional mechanisms for long-term sustainable management. Application of water consumption metering is of major importance to identify opportunities for improvement in water supply and service quality, and to reduce wasteful consumption.

The comprehensive approach to infrastructural improvement should be supported by establishing and/or strengthening coordination mechanisms among the relevant stakeholders to ensure balanced tariff policies and service continuity. Established coordination practices and close stakeholder collaboration is essential to the efficacy of disaster responses, which should include a strategy/plan for resumption of utility services following disaster events.

Paragraph 1 of Article 9 of the Town Planning Code enshrines the rights of individuals and legal entities (utility companies as such electricity, water etc.), to take part in the decision-making processes related to urban planning activities.

In addition to conducting participatory sessions with communities and Mahalla chiefs on utility provision and tariff policies, it is suggested that a range of campaigns and advocacy programmes in sustainable waste management and day-to-day practices are introduced to foster behavioural change at the community level that will support the city in long-term efforts to improve waste management.

Any interventions in waste management should be supported by awareness raising and sensitisation activities to ensure communities understand how the waste treatment facility operates, how they can gain from it, and how their role is crucial to maximise the benefits of a well-established waste management system. In addition to an appropriate regulatory framework, technical capacity-building, and adequate financing mechanisms, a critical component to ensure successful implementation of any waste management intervention is public awareness and participation. The necessity of awareness-raising activities was identified during the community engagement activities.

RESPONSE 5

HMS GMS URS HRS

Install, formalise and improve waste collection points and landfill site	Expand the waste collection network to cover all neighbourhoods	Install and pilot water meters
Expand the sewarage network	Implement planned water network projects	Formalise the informal connections to water networks by increasing access to the formal water network
Install filters to septic tanks	Improve pump capacity for sewarage network	Renew the quality/material of the old water network, and repair sections that are non-functional
Improve the condition of the existing, and upgrade the material used for sewarage pipelines	Improve and restore irrigation channels	

Fig 34. Response 5 - summary of actions

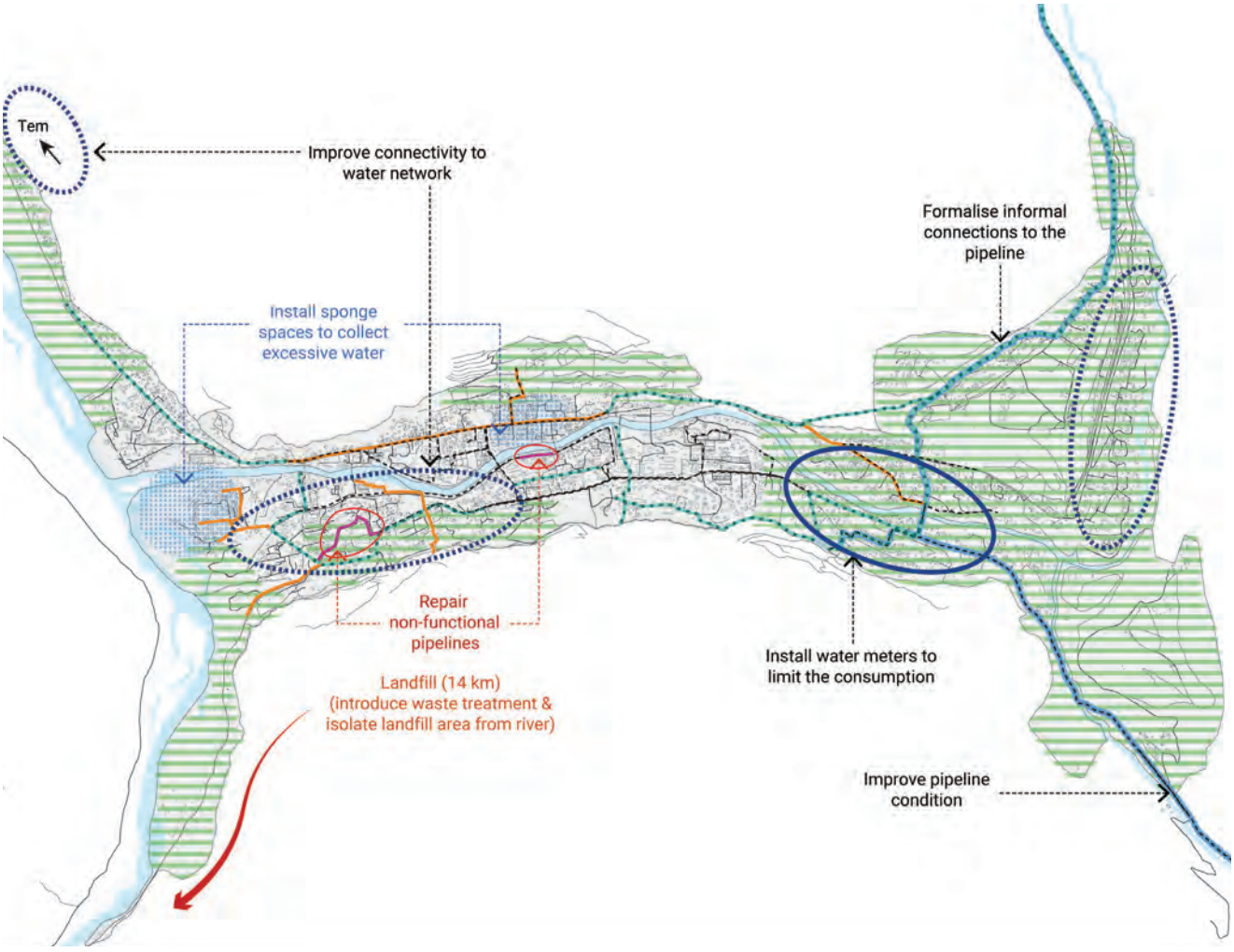


Fig 35. Proposed interventions to support Basic Service Provision Strategy

3.11.ISSUE 6: UNEQUITABLE DISTRIBUTION OF SOCIAL FACILITIES

The sixth challenge lies in the low correlation between existing population densities and provision of public facilities, which has resulted in low levels of access to fundamental public services in certain areas of Khorog. Tem has limited access to a health facility, Nivodak, Dashti Bolo and Valdosh Gulmamad are without sports facilities, and kindergartens are lacking in the east of the city. As can be identified in figure 34, the areas of Sharifibod, Nivodak, Gulobod, Andarsitez, Dashti Bolo, Valdosh Gulmamad and Chukht Khorog face the most critical shortages of public service provision, which was corroborated during the community engagement activities.

While new service centres are being constructed, this is often a response to the pressure of high demand and capacities can become stretched. For example, AKAH constructed a sport facility in Andarsitez, which has become the only public space in the area and is often overcrowded as a result. Several facilities are under high demand in Saifullo Abdulo, Tabobatkhona and Khorugi Bolo. Facilities with capacities that are insufficient for the high population density in their vicinity will be stressed further as the population grows.

Some facilities are located within hazard zones. Several fuel stations are located in hazard-prone areas, which generates considerable risk for human and environmental security. As was identified during the community engagement activities, very often new fuel stations are built just metres away from those that have previously been destroyed by natural events, which indicates the requirement for a spatial strategy in urban resilience.

Moreover, the current facility distribution and that they have fixed rather than multiple or flexible operational modes do not align with the hazard assessment nor a strategy of hazard adaptation. There are also minimal facilities that can support hazard responses (for example storage or emergency accommodation).

Fig 36. Football pitch in the central area of Khorog, May 2021

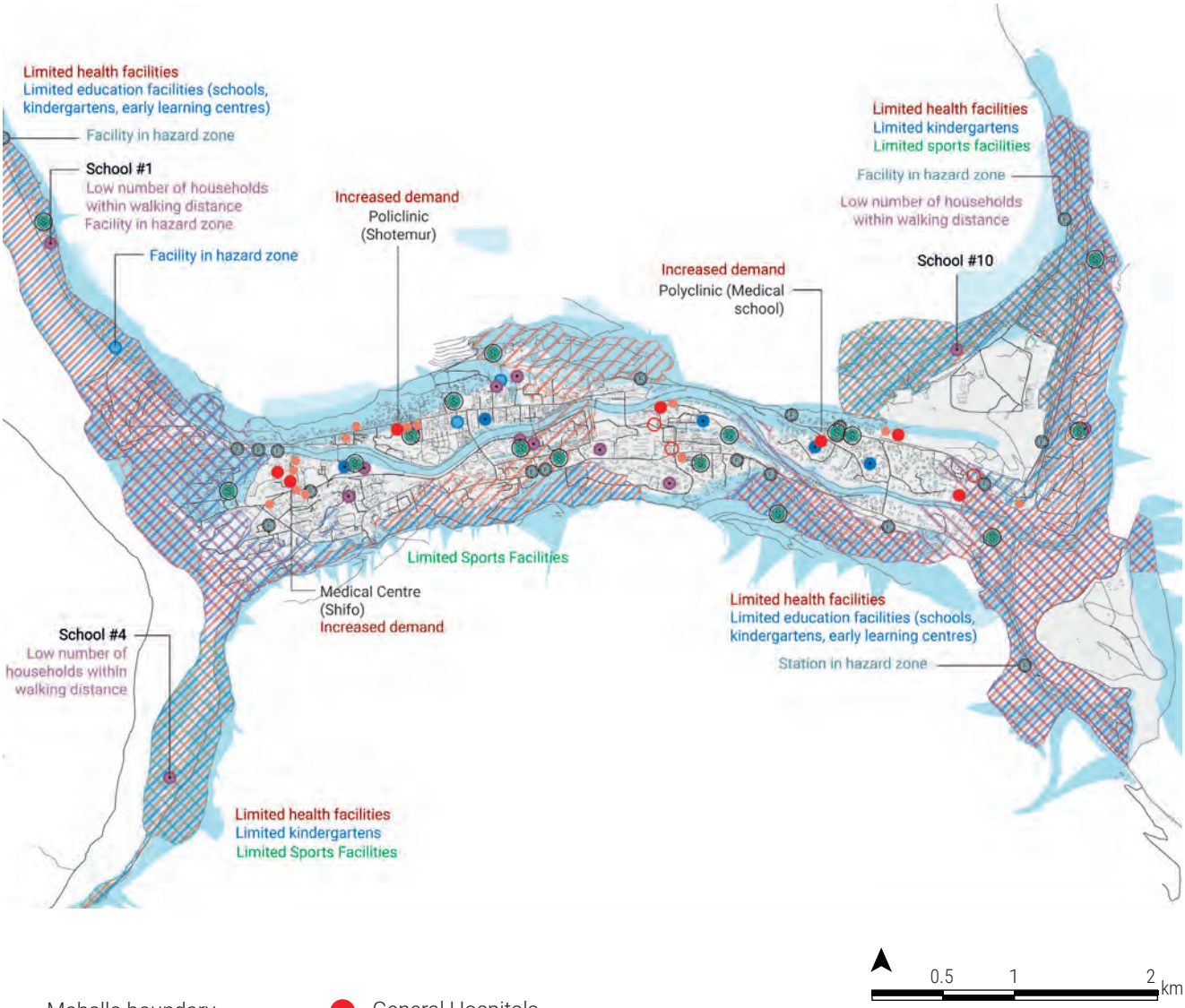


Fig 37. Inequitable Distribution of Social Facilities

3.12.RESPONSE 6. EQUITABLE ACCESS AND EFFICIENT USE OF SOCIAL FACILITIES

3.12.1. Spatial Dimension

In response to the challenges outlined above, an integrated approach to equitable access and provision of facilities is recommended, to align the implementation of new social facilities with new nodes of densification, public space provision, utilities provision, and climate change and hazard monitoring. This strategic integration will improve access and provision of services and facilities for current and future populations, ensuring that they are safe from hazardous events and play a role in supporting recovery.

New facilities are recommended to address existing accessibility issues and to accommodate population growth. The size, location, capacity and design of each facility must be assessed in accordance with the specific surrounding context, in a collaborative process with participation from surrounding communities. This will ensure that each facility responds to the surrounding population density, demographic, and urban typology at a neighbourhood scale.

In total, 5 new kindergartens, 5 medical facilities, 2 schools and 2 sports facilities are required to ensure equal, adequate access to all of the existing population (within a 15-minute walking distance). The priority areas for these facilities are in Chukht Khorog, Gulobod, Nivodak, South Tabobatkhona/Sharifobod/northern Nivodak, Dashti Poyon and Dasthi Bolo/Valdosh Gulmamad. These facilities will ensure more equitable distribution of access, and reduce the burden on existing facilities.

Certain facilities currently are located within hazard zones. Considering the intensity, frequency and type of hazard risks in these areas, it is recommended that eight fuel stations are relocated, and that hazard mitigation measures are increased for three schools (in Dashti Bolo, Nivodak and Furudgoh). The schools and kindergartens located within hazard zones are at risk from landslides and rockfalls. Although terracing exists in the west, it is lacking in Dashti Bolo. Additional terracing, tree planting, trenches, sheet piling, rock bolts and intercepting drains are recommended in these areas.

Finally, as part of the hazard mitigation and coping strategies, it is recommended that facilities with the potential for secondary uses are considered for use as emergency shelters in the case of a hazardous event, and/or as storage facilities for emergency equipment and back-up electricity generation. Existing community or organisation-led emergency response programmes must be aligned with the provision of second-use facilities and emergency shelters. Engagement with the UCA to plan for secondary uses of the campus in emergency response is crucial, as the campus is in a low risk area, hosts a low student population, and comprises ample space and facilities.

Fig 38. View on the city from Imomobod, May 2021

3.12.2. Non-spatial dimension

Building code enforcement, including building height regulation, is recommended to ensure new facilities are built to withstand potential seismic shock and to promote accessibility. Accessibility provisions such as unimpeded access for persons with disabilities can be ensured in all public facilities with the creation of a body to monitor compliance of new and existing buildings with legislative norms.

Article 25 of the Law of Tajikistan on Social Protection of Persons with Disabilities of January 2011 stipulates that the authorities must "create conditions for persons with disabilities [...] for unimpeded access to social infrastructure facilities (residential, public and industrial buildings, sports facilities, places of rest, cultural, educational and other facilities and institutions), and for the unimpeded use of rail, air, intercity road transport and all types of urban and suburban passenger transport, communications and information.

Participation in the decision-making process for the placement and design of new schools, kindergarten and medical facilities is necessary at all stages, including during determination of the future capacity and design development. Persons with disabilities, young people and girls should be empowered to contribute to this participatory process which can be ensured with revisions to the existing urban development legislation on participation.

Accessibility will be enhanced with the implementation of additional social facilities in the city, however, the cost of education and health care require consistent review and inclusionary programmes should be assured in sport facilities to ensure that non-spatial barriers do not impede the efficacy of physical provisions.

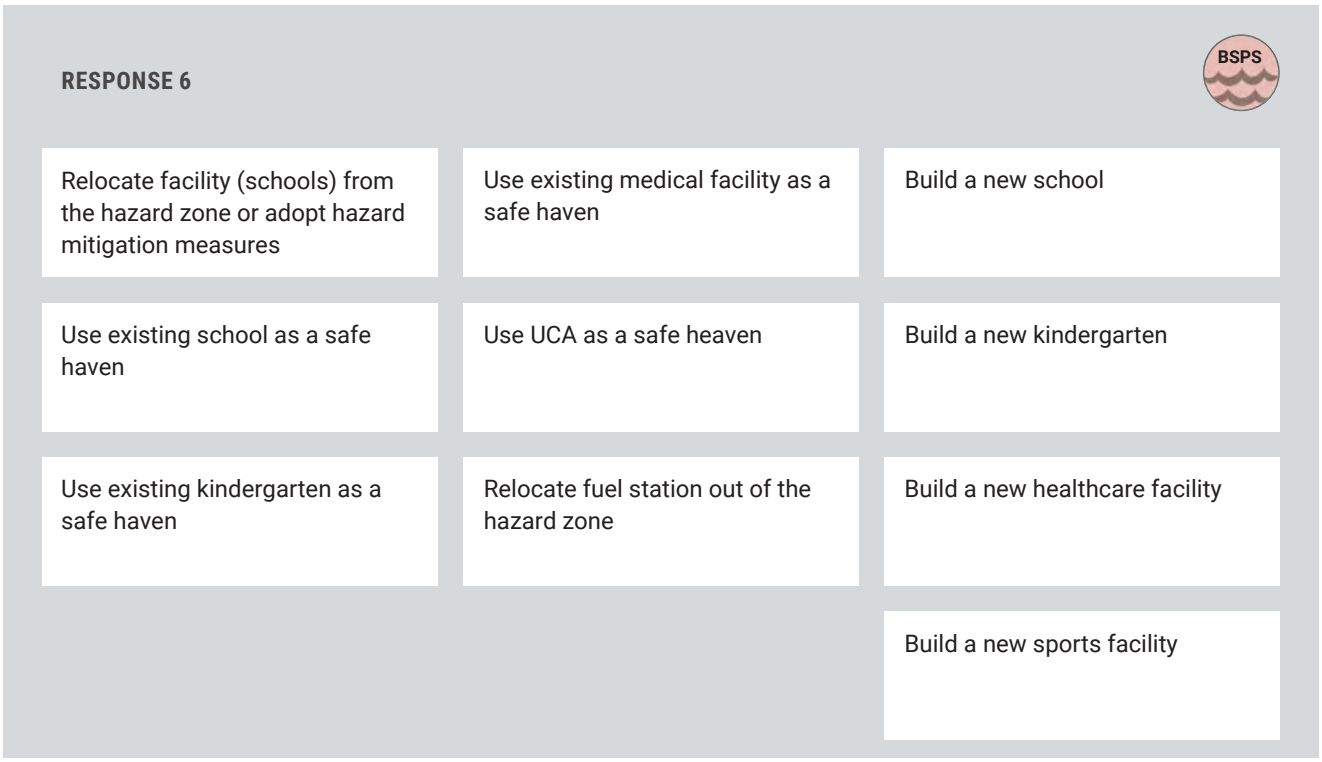


Fig 39. Response 6 - summary of actions

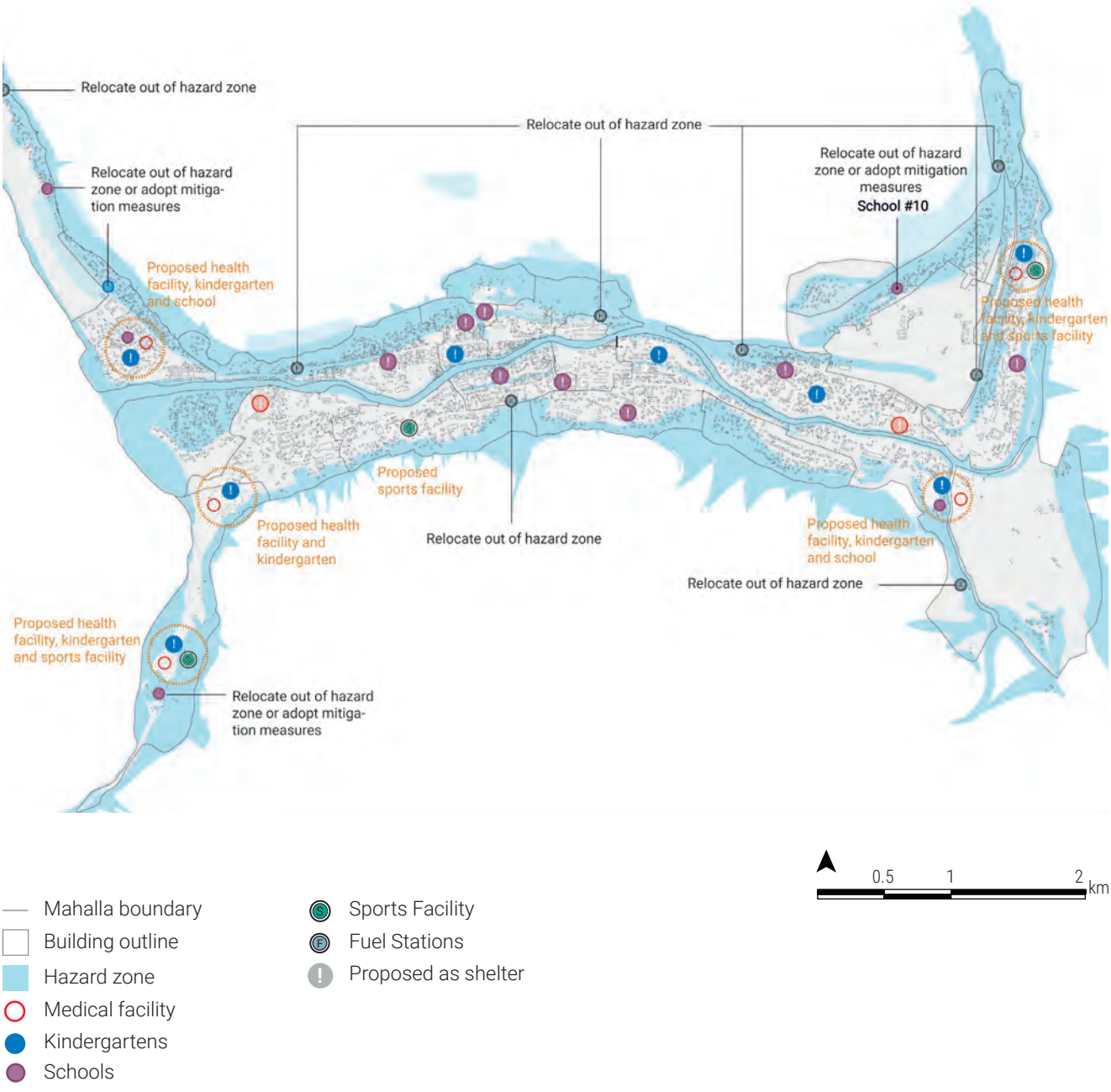


Fig 40. Proposed interventions to ensure equitable and safe access to social facilities

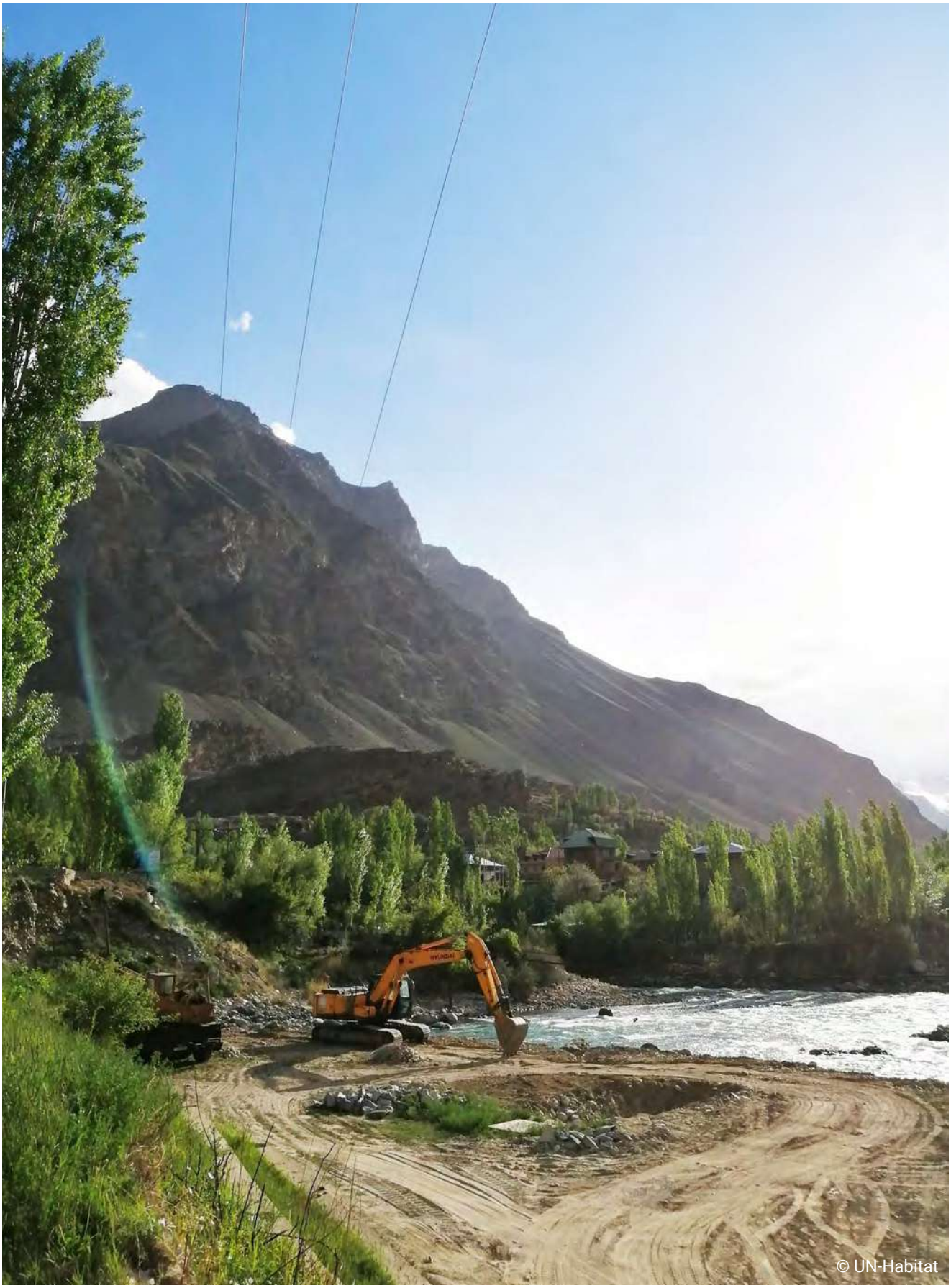


Fig 41. Construction site along the river, May 2021

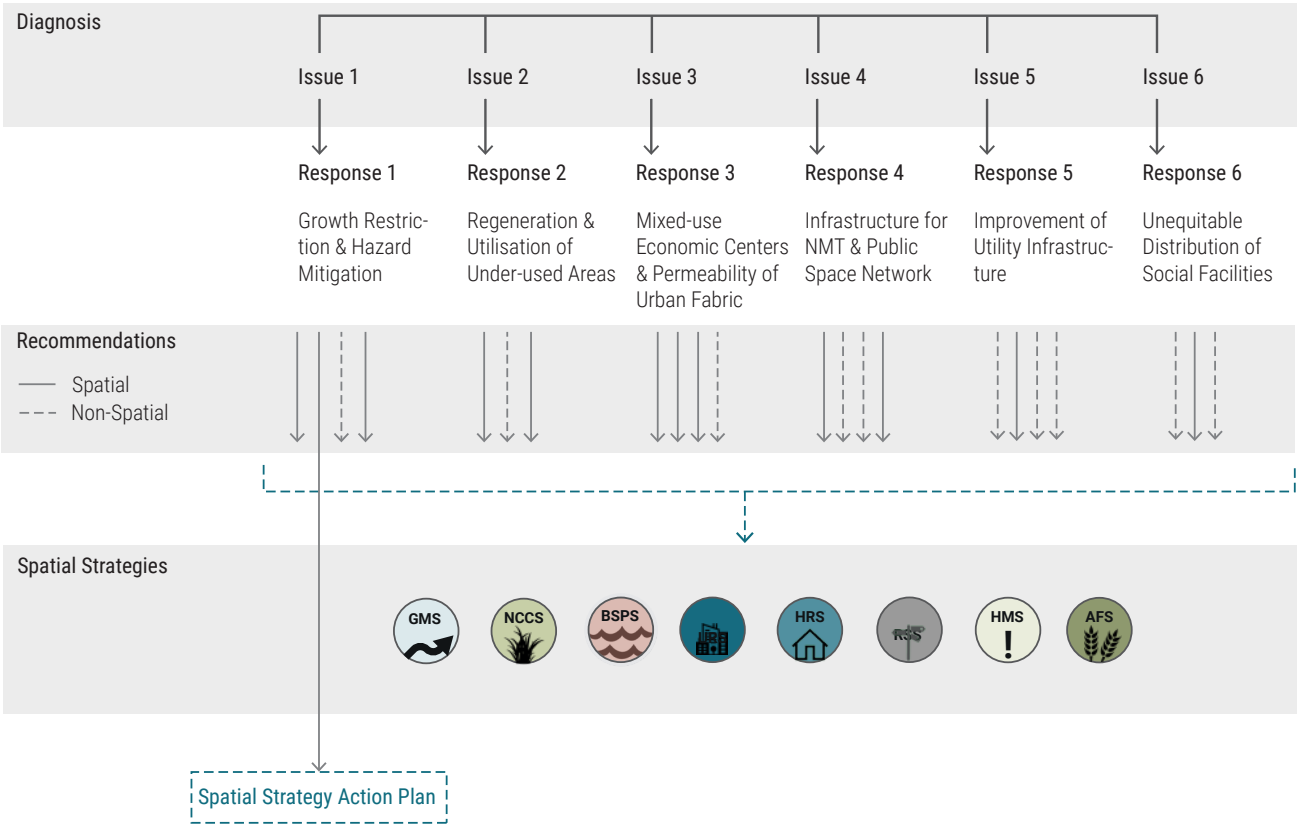
4

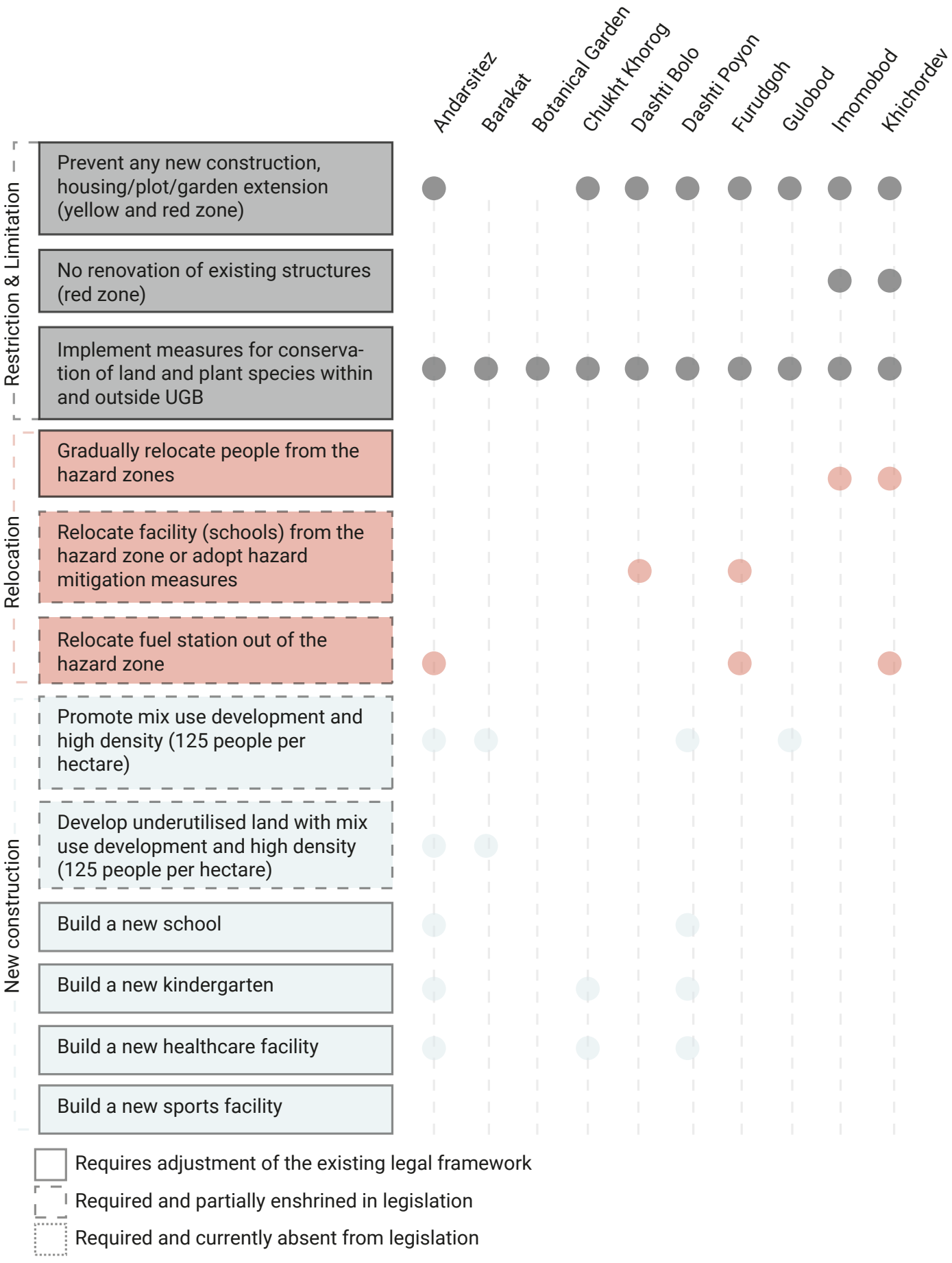
ACTION PLAN

Transforming strategic recommendations into implementable strategies requires detailed systemic actions, that can incrementally trigger spatial, legal, and socio-social transformations. In this city, the above six challenges were identified in a process of detailed analysis, each of which is addressed with a corresponding response. All responses comprise both spatial (physical, implementable projects) and non-spatial actions (supporting legislature, management frameworks or financial mechanisms).

The strategic recommendations have been comprehensively detailed in their spatial, social, economic, legal, and institutional dimensions in this report.

The spatial actions that these recommendations entail are then summarised in the form of a table below, highlighting the areas or Mahallas in which each action should be implemented. This overview supports a comparative analysis between Mahallas to identify 'hot spots' or spatially overlapping actions, which will assist in the later formulation of action plans to identify priority actions or areas, catalytic actions or areas, areas for demonstration projects (these will be developed further in phase 2), and to plan for phasing, and financing mechanisms.

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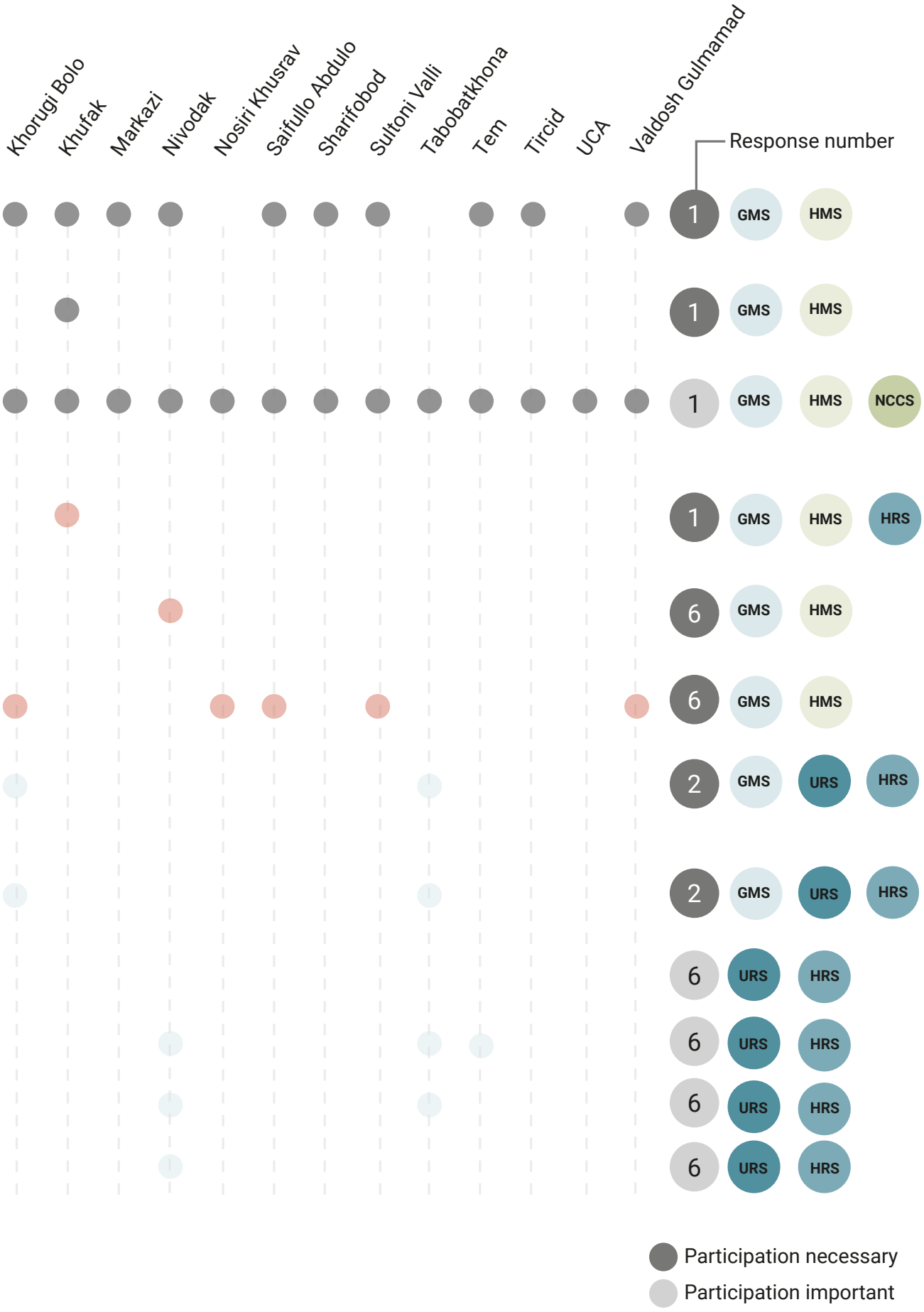
Dashti Poyon
Furudgoh
Gulobod
Imomobod
Khichordev
Restriction & Limitation
Prevent any new construction, housing/plot/garden extension (yellow and red zone)
No renovation of existing structures (red zone)
Implement measures for conservation of land and plant species within and outside UGB
Relocation
Gradually relocate people from the hazard zones
Relocate facility (schools) from the hazard zone or adopt hazard mitigation measures
Relocate fuel station out of the hazard zone
New construction
Promote mix use development and high density (125 people per hectare)
Develop underutilised land with mix use development and high density (125 people per hectare)
Build a new school
Build a new kindergarten
Build a new healthcare facility
Build a new sports facility
Requires adjustment of the existing legal framework
Required and partially enshrined in legislation
Required and currently absent from legislation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Tabobatkhona
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Tircid
UCA
Valdosh Gulmamad
Response number
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1 GMS HMS HRS
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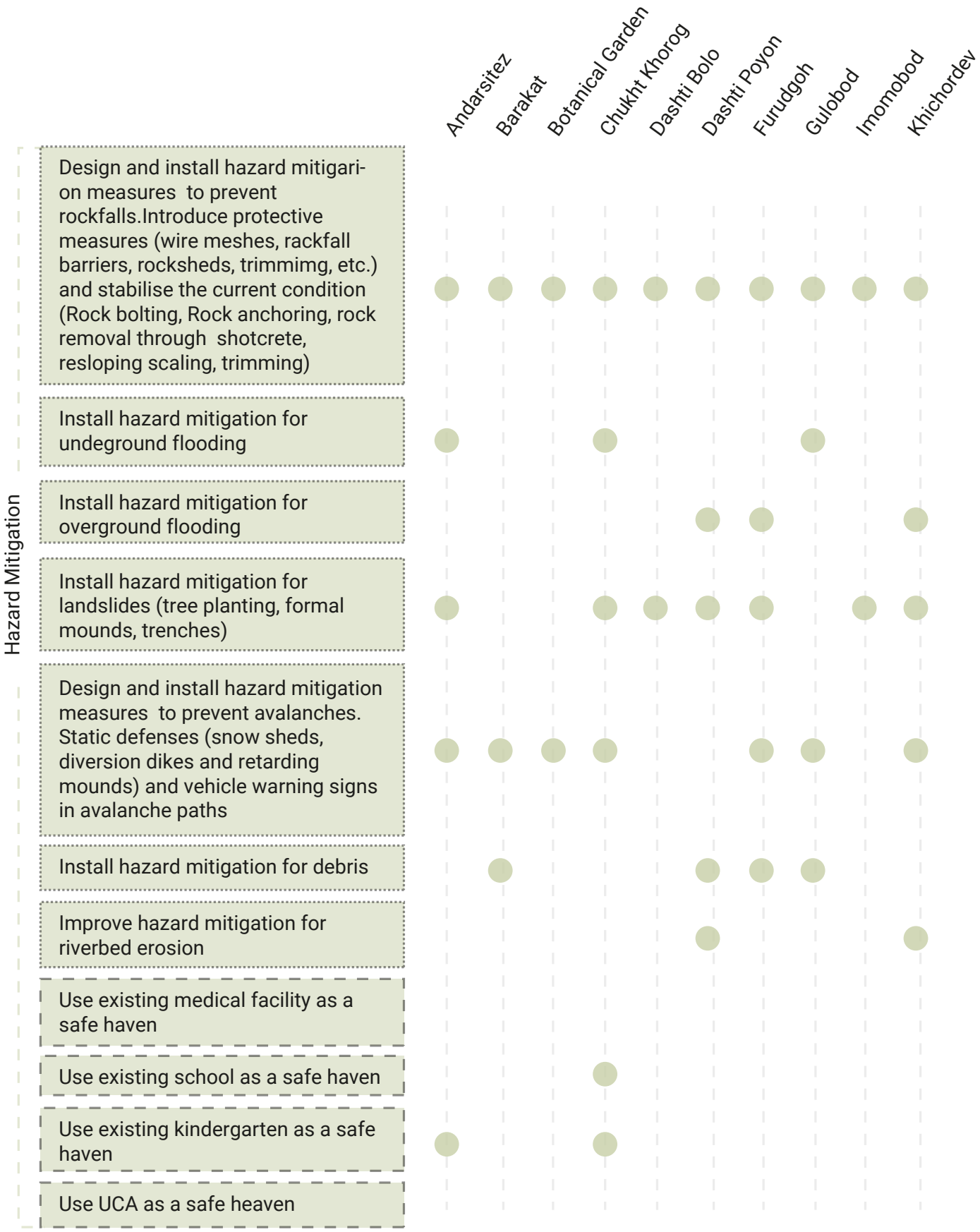
Participation necessary
Participation important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Dashti Poyon
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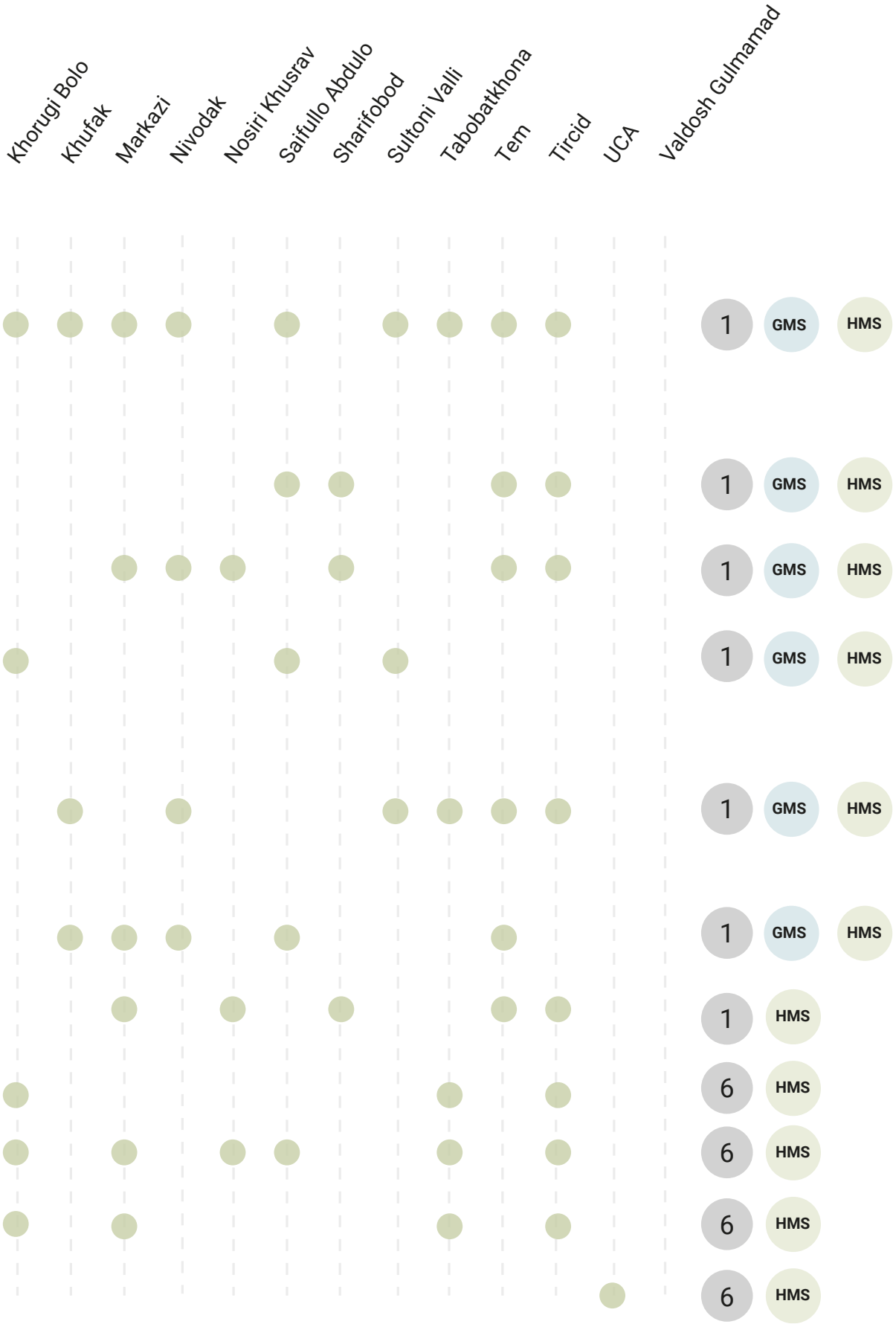
Gulobod
Imomobod
Khichordev
Hazard Mitigation
Design and install hazard mitigari-on measures to prevent rockfalls.Introduce protective measures (wire meshes, rackfall barriers, rocksheds, trimmimg, etc.) and stabilise the current condition (Rock bolting, Rock anchoring, rock removal through shotcrete, resloping scaling, trimming)
Install hazard mitigation for undeground flooding
Install hazard mitigation for overground flooding
Install hazard mitigation for landslides (tree planting, formal mounds, trenches)
Design and install hazard mitigation measures to prevent avalanches. Static defenses (snow sheds, diversion dikes and retarding mounds) and vehicle warning signs in avalanche paths
Install hazard mitigation for debris
Improve hazard mitigation for riverbed erosion
Use existing medical facility as a safe haven
Use existing school as a safe haven
Use existing kindergarten as a safe haven
Use UCA as a safe heaven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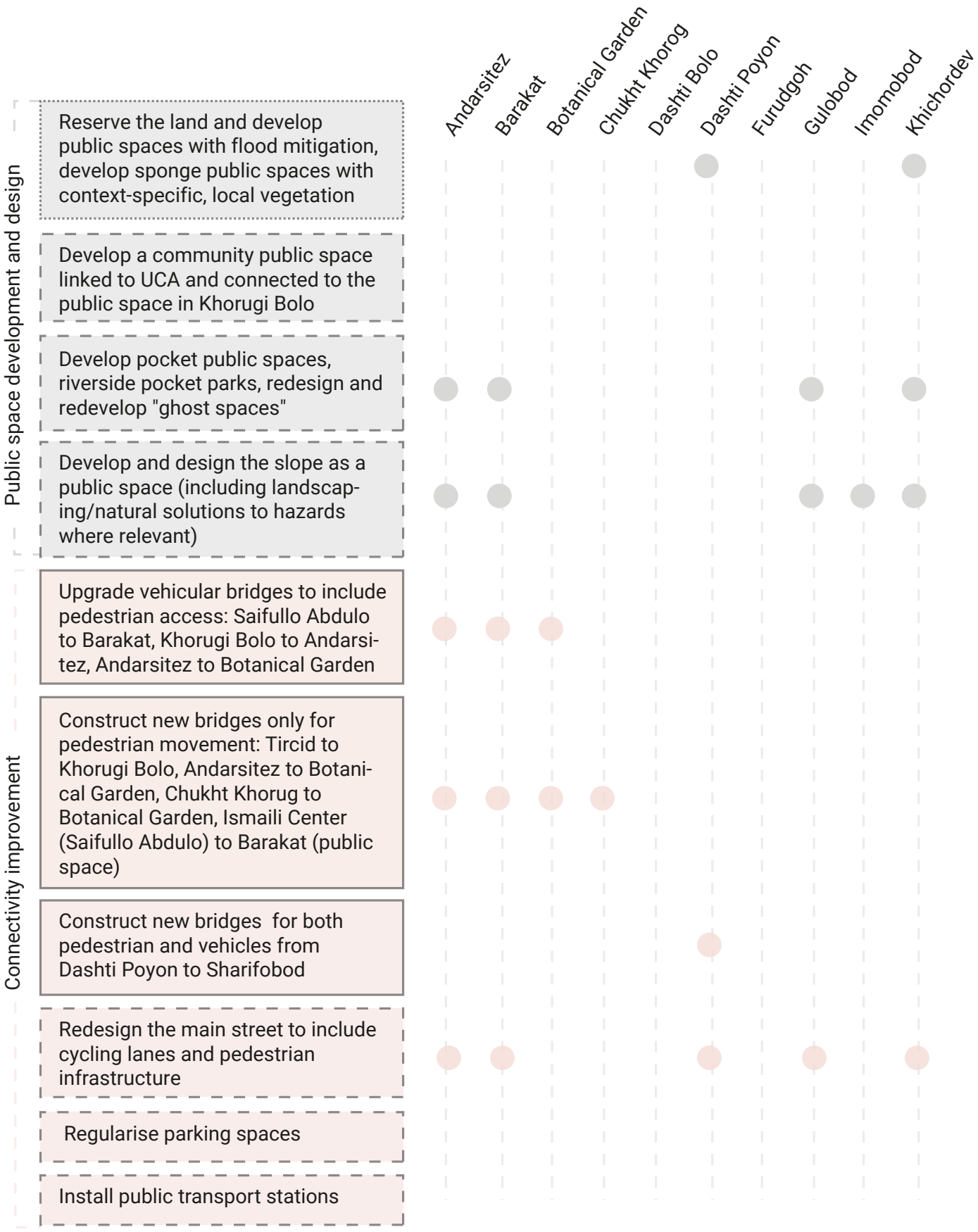
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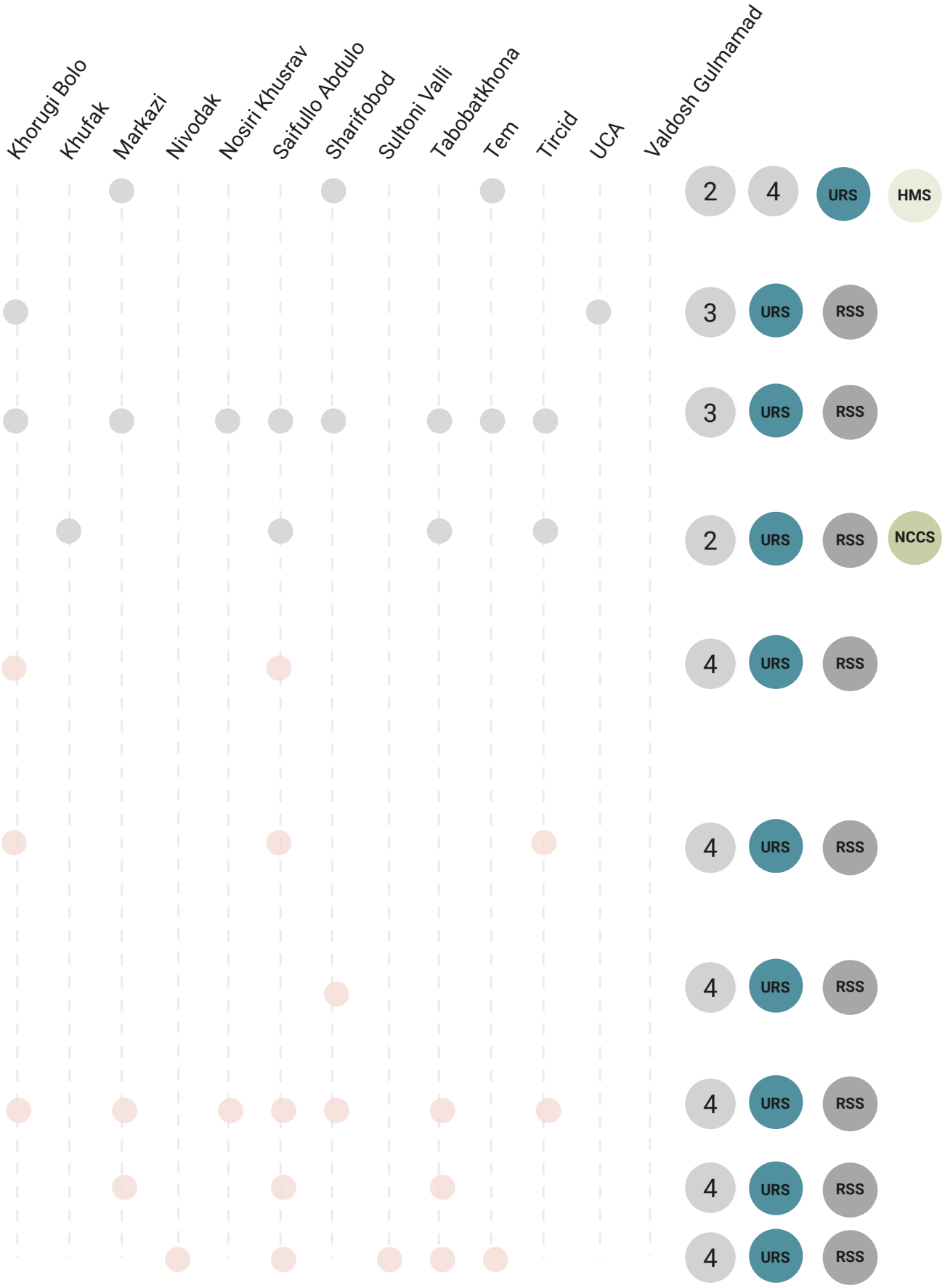
Botanical Garden
Chukht Khorog
Dashti Bolo
Dashti Poyon
Furudgoh
Gulobod
Imomobod
Khichordev
Public space development and design
Reserve the land and develop public spaces with flood mitigation, develop sponge public spaces with context-specific, local vegetation
Develop a community public space linked to UCA and connected to the public space in Khorugi Bolo
Develop pocket public spaces, riverside pocket parks, redesign and redevelop "ghost spaces"
Develop and design the slope as a public space (including landscaping/natural solutions to hazards where relevant)
Connectivity improvement
Upgrade vehicular bridges to include pedestrian access: Saifullo Abdulo to Barakat, Khorugi Bolo to Andarsitez, Andarsitez to Botanical Garden
Construct new bridges only for pedestrian movement: Tircid to Khorugi Bolo, Andarsitez to Botanical Garden, Chukht Khorug to Botanical Garden, Ismaili Center (Saifullo Abdulo) to Barakat (public space)
Construct new bridges for both pedestrian and vehicles from Dashti Poyon to Sharifobod
Redesign the main street to include cycling lanes and pedestrian infrastructure
Regularise parking spaces
Install public transport stations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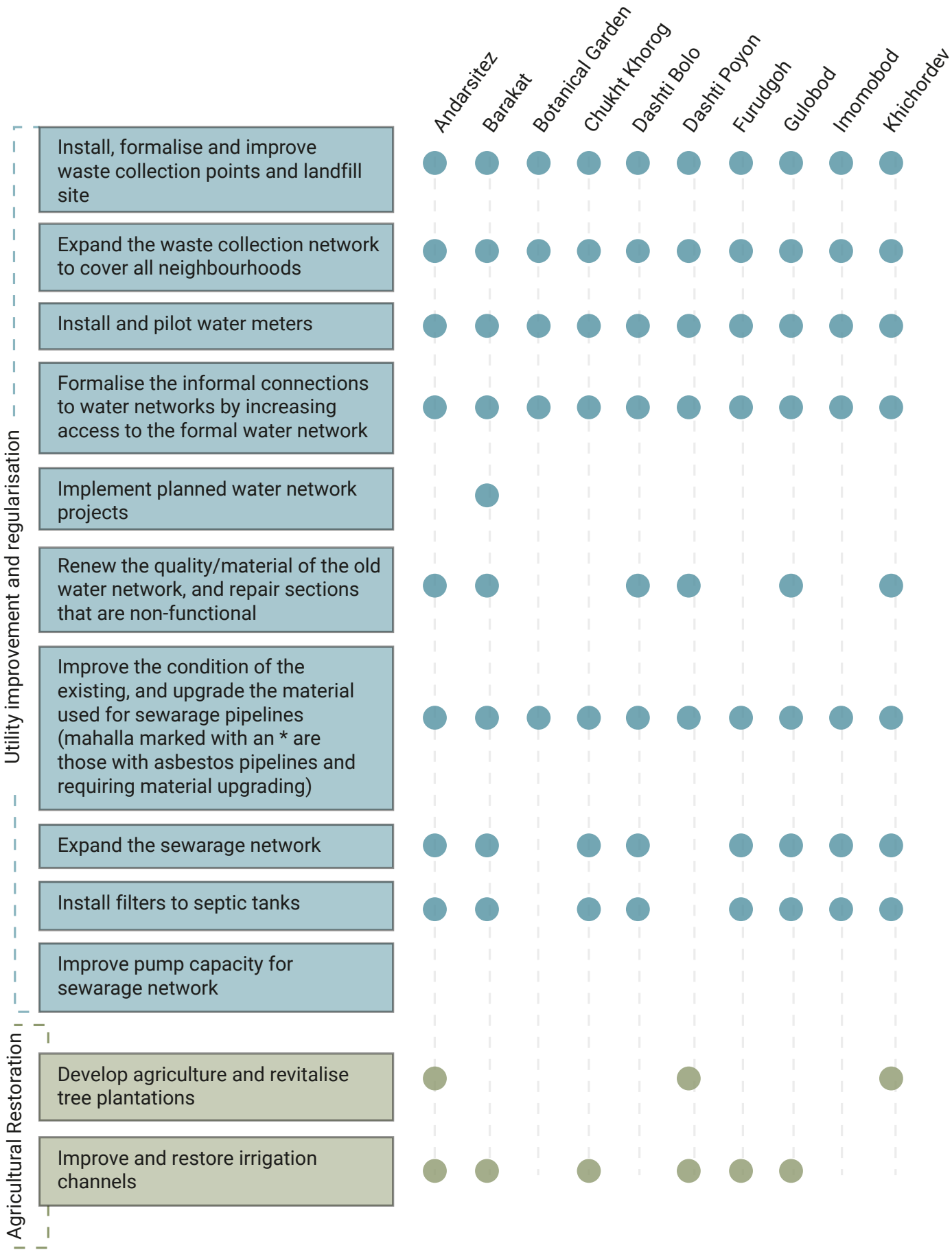
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Botanical Garden
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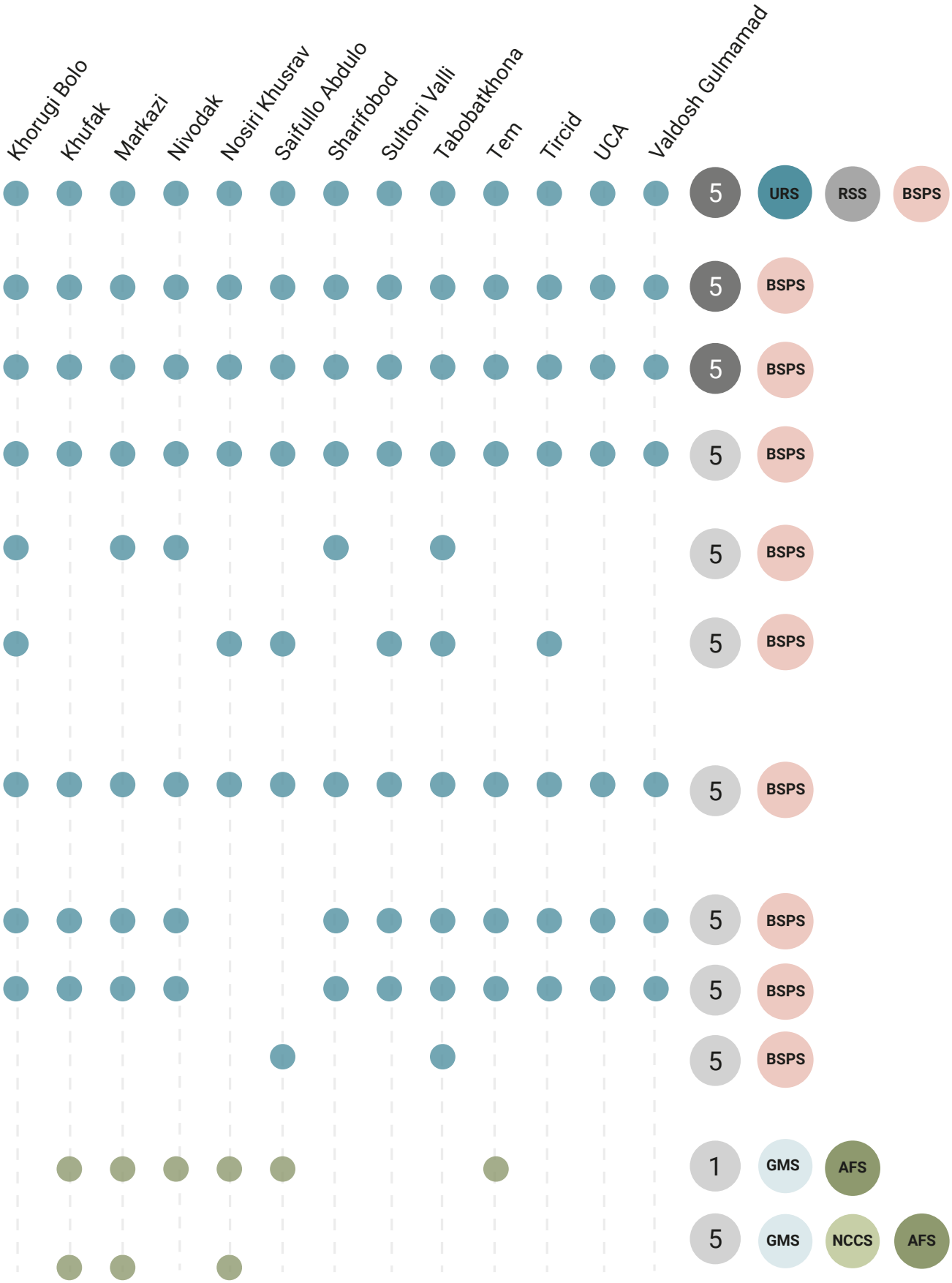
Dashti Bolo
Dashti Poyon
Furudgoh
Gulobod
Imomobod
Khichordev
Utility improvement and regularisation
Install, formalise and improve waste collection points and landfill site
Expand the waste collection network to cover all neighbourhoods
Install and pilot water meters
Formalise the informal connections to water networks by increasing access to the formal water network
Implement planned water network projects
Renew the quality/material of the old water network, and repair sections that are non-functional
Improve the condition of the existing, and upgrade the material used for sewarage pipelines (mahalla marked with an * are those with asbestos pipelines and requiring material upgrading)
Expand the sewarage network
Install filters to septic tanks
Improve pump capacity for sewarage network
Agricultural Restoration
Develop agriculture and revitalise tree plantations
Improve and restore irrigation channels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5 BSPS
5 BSPS
5 BSPS
1 GMS AFS
5 GMS NCCS AFS

Each action has been grouped by thematic areas (Restriction and/or Limitation measures, Relocation measures, Hazard Mitigation measures, Agricultural Restoration, New Construction, Public Space Development and Design, Connectivity Improvement, Utility Improvement and Regularisation) in order to identify connections across the thematic areas served by the actions proposed.

The actions that comprise the recommendations outlined here strongly emphasise utility improvement measures (39 per cent). The maps in figure 42 illustrate the spatial distribution of each thematic action area. Utility improvement actions are the most numerous and widespread across the city. Actions related to hazard mitigation and limitation measures are also prevalent and widespread. The emphasis of these recommended actions is not individual, project-based and location-specific, but is impressed on integrated, city-wide strategies that are focused on basic services and emergency response.

Figure 39 highlights that the number of actions recommended in each Mahalla is diverse, however, more actions are proposed in Andarsitez, Dashti Poyon and Tabobatkhona than in other Mahallas. The thematic areas in which interventions are proposed are also diverse in each Mahalla, however, Andarsitez and Dashti Poyon are recommended for the highest diversity of actions across thematic areas. This exercise will assist in the second phase of the project, in which financing and phasing models will be applied to actions and demonstration projects will be identified.

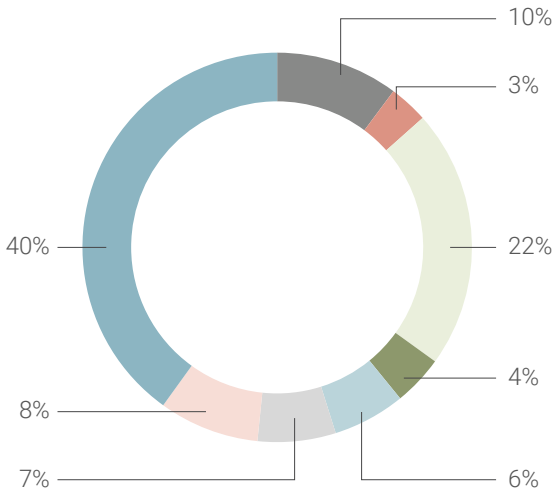


Fig 43. Thematic areas of recommended actions

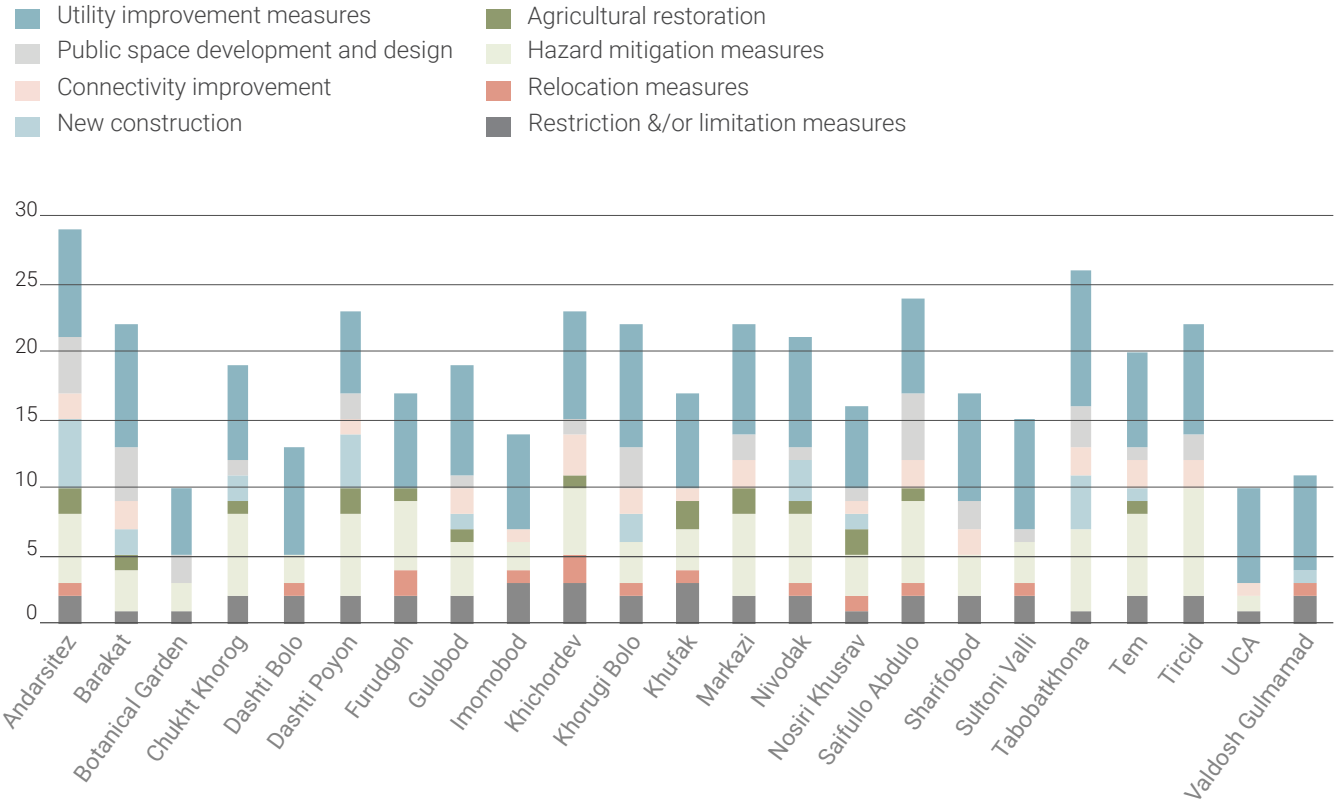


Fig 42. Diversity of actions for each Mahalla

Fig 44. Development along the riverfront, May 2021

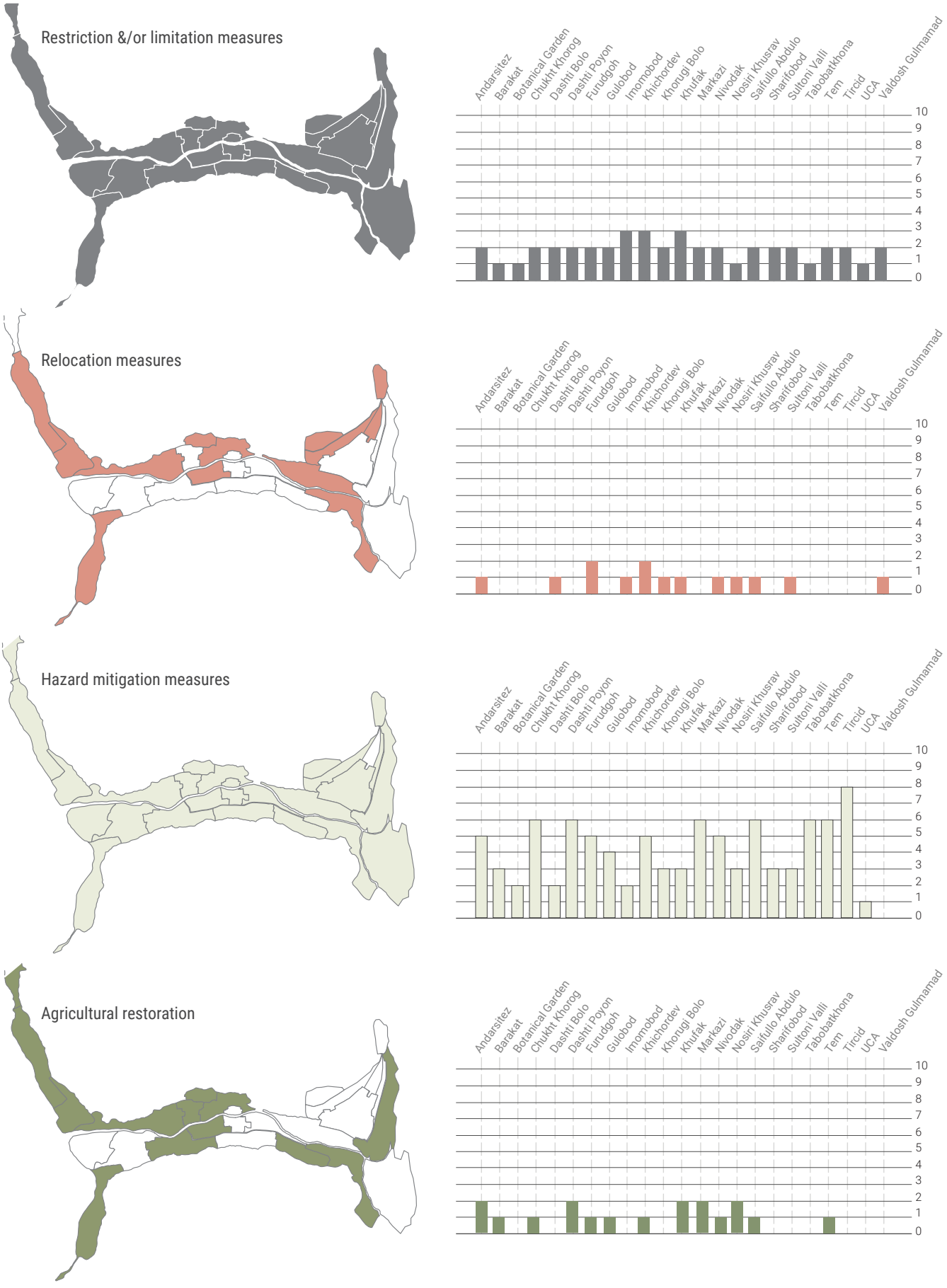
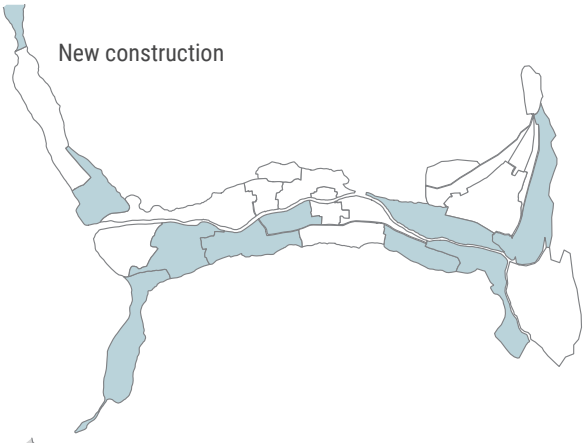
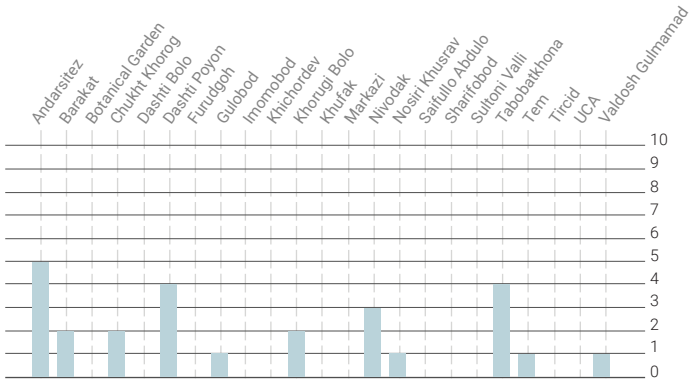


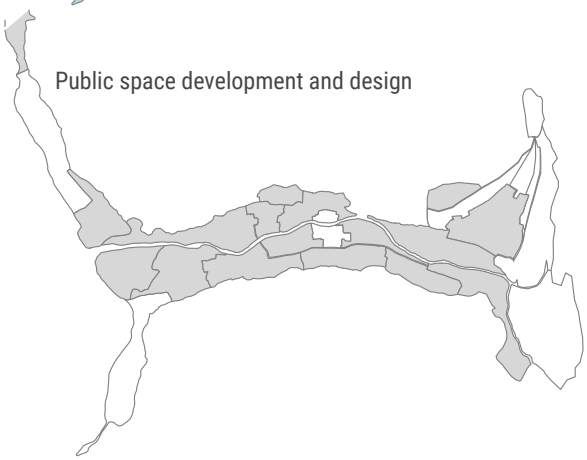
Fig 45. Distribution of thematic actions & summary of actions per thematic area across mahallas

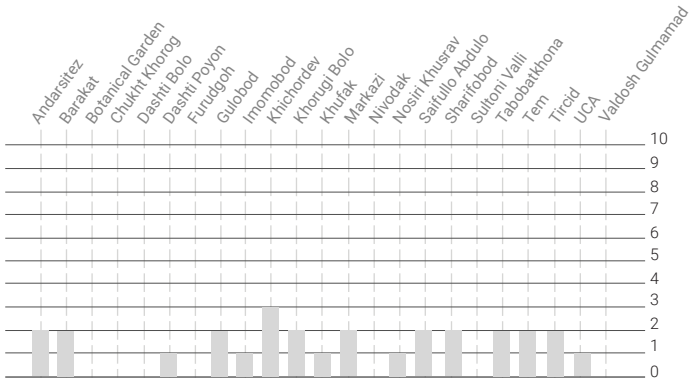
New construction



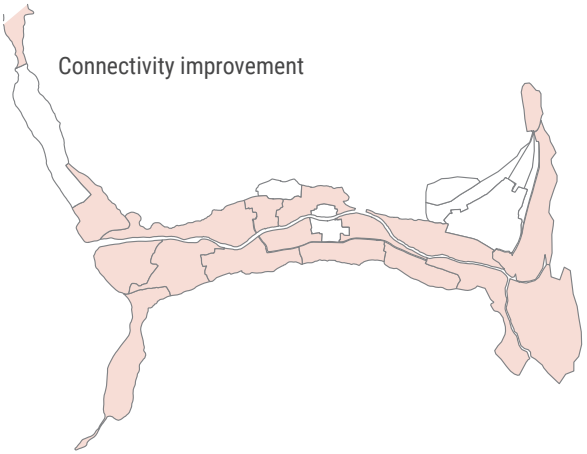


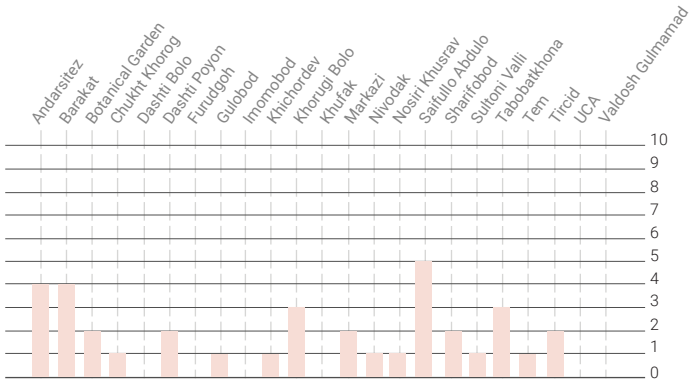
Public space development and design





Connectivity improvement





Utility improvement measures

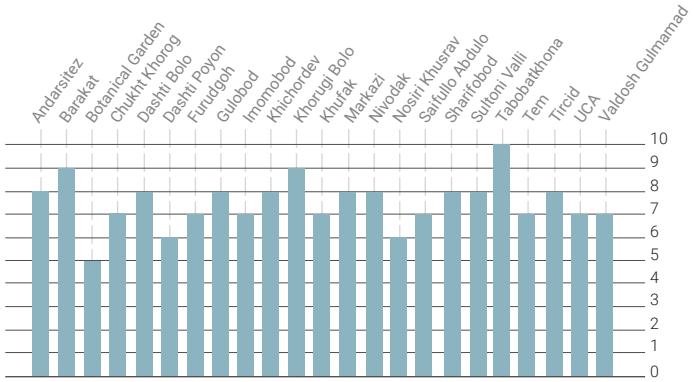


Fig 46. Residential area in the central part of Khorog, May 2021

5

SUSTAINABLE PRINCIPLES IN ACTION

Modelling future scenarios based on recommended actions assures the impact of the regeneration and consolidation strategies on the spatial organisation and productivity of the city. In accordance with the UN-Habitat principles for sustainable development, these actions collectively will gradually rebalance residential and mixed-use functions in the city to address fragmentation caused by monofunctional development.

The diversification of land use to encourage mixed-use development in specific nodes of regeneration and along mobility axes will have a significant impact on economic productivity by increasing employment opportunities, which is critical to support the future growth of the city.

The impact of the recommendations on density, land use and productivity, all of which are interlinked elements of efficient urban form, are assessed in this chapter. The current data on land allotment and population distribution can assist in estimating the current status of employment opportunities, in a way that is spatially disaggregated.

5.1. METHODOLOGY

Future scenario models are based on land use and population calculations that are derived from ratios embedded in strategic principles applied to targeted areas, or key nodes, of the city. Five key nodes were identified for future scenario modelling using the principles of all six recommendations.

The area of each node is divided by the estimated area (sq m) allocated to each land use type, to produce an estimated employment ratio, that is further validated with research and samples applied to the case of Khorog. Therefore, the calculated results should be taken as a reference, considering that numbers may vary according to further factors.

Land use data has been collected from diverse sources, and therefore, it is recommended that the following results are taken as estimates to be re-assessed and updated before detailed land-use adjustments and densification strategies are implemented. The main purpose of this analysis is to highlight the dynamics of densification, land use diversity and economic productivity. Outcomes are indicative and additional studies are advised. Using these five nodes to test the recommendations, the future scenario calculations were derived from the following:

1) The first exercise examines under-utilised land within each of the 5 nodes and assesses the impact of utilising the potential of this under-utilised land by introducing mixed-use development following UN-Habitat principles for sustainable neighbourhood planning.[i]
2) As a second step, a land use diversification model is applied to the existing built-up area within the 5 nodes. The land use diversification according UN-Habitat principles for sustainable neighbourhood planning aims to demonstrate the way to rebalance the land uses to reduce mono-functional, fragmentary development and to illustrate the outcomes of greater neighbourhood integration and job creation, which should be supported by land use readjustment policies.
3) Next, existing building heights within the five nodes are increased to reach an average number of 3 storeys to increase the population density and economic opportunities in these nodes.
4) Finally, due to data limitations on population growth rates, population forecasts were not able to be assessed. Instead, the first phase future scenario calculations were used to forecast the potential future population density of the city, based on land-use readjustment, re-development and elaborated according to the recommended increases in housing provisions.

i https://unhabitat.org/a-new-strategy-of-sustainable-neighbourhood-planning-five-principles-0

5.2. TARGETED NEIGHBOURHOODS (THE FIVE NODES)

Node 1: This strategic densification node includes 7,2 ha in the area of Dashti Poyon, between the Panj river and the main road, and south of the airport. The selection of this area is based on its strategic location that is proximate to the airport and the cross-border market. The area is also already demonstrating the likelihood of densification as the city centre is expanding in this direction, a new supermarket has been introduced, and it is the site of the mayor's office, numerous administrative buildings, AKAH's offices and several restaurants. Though the node is located close to the Afghanistan border with some security challenges, it is critical to consider the long-term opportunities offered by the proximity of the airport and cross-border market to promote agglomeration economies that can stimulate redevelopment of the area.

Node 2: This strategic densification node includes 10,2 ha in the built-up area in Tabobatkhona and a 20,5 ha plot of underdeveloped land in Barakat. Currently, this node provides a number of employment opportunities in public services provision, however, private sector productivity in the area is low. The potential increase in economic productivity generated by mixed-use development of currently under-utilised land will strengthen the performance of the area to create a new urban centrality. Potential densification of this node will be supported by the vehicular bridge (Saifullo Abdulo to Sharifobod) that is currently planned, which will bring traffic flow to the area and expand its service coverage to peripheral city neighbourhoods such as Nivodak.

Node 3: This strategic densification node includes 9.4 ha that covers Nosiri Khisrav and Barakat. The node includes plots mainly comprised of public services, commercial and industrial activities. The industrial sites can be consolidated to increase employment opportunities in the sector. The strong connectivity between this node and the city centre, means that it is already an area of potential densification. As the city centre expands, this node can provide a secondary economic focus if supported by appropriate policy and regulations to guide urban design and facilitate mixed-use development and employment diversity.

Node 4: This strategic densification node includes 5 ha covering the area of Andarsitez along the river and a stretch in Gulobod and has 8.6 ha of underdeveloped land. Currently, the node has largely residential uses, highlighting an example of fragmentary, monofunctional development. A significant increase in commercial uses will address this issue.

Node 5: This strategic densification node covers 8.4 ha in Khorugi Bolo and includes 2.2 ha of underdeveloped land. The node includes plots that are currently allocated to public services and industrial activities and appears to be in the process of consolidation yet lacks commercial activities. If the vehicular bridge that connects this area to node 4 is improved in line with the recommendations outlined in the previous chapter, this node could strengthen economic activity in the city, whilst providing service coverage to areas in the northeast.

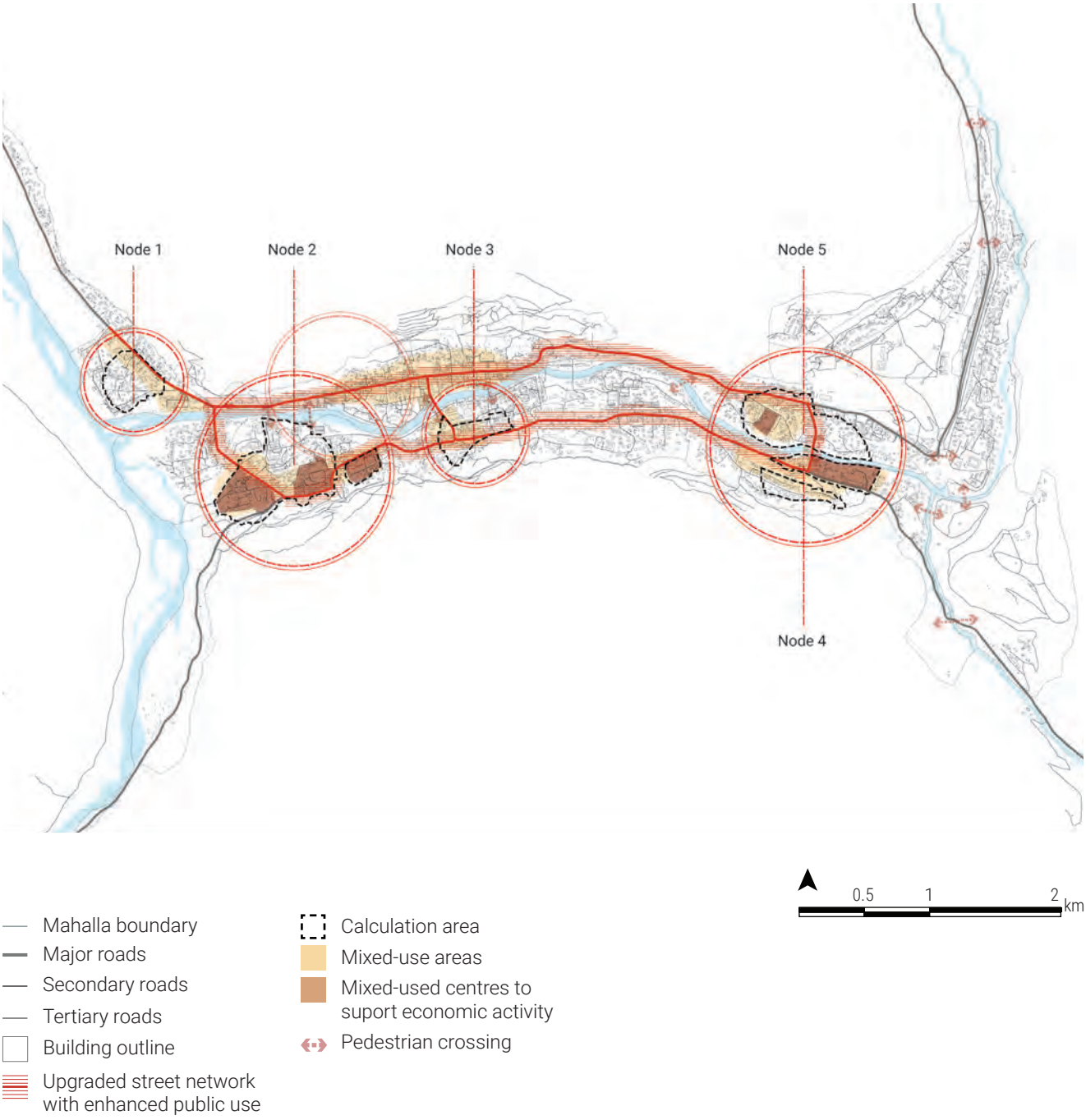


Fig 47. Five nodes for future scenario modelling

5.3. PRODUCTIVITY ANALYISIS

This productivity analysis demonstrates the impact that recommendations, including strategic regeneration and consolidation principles, has on the efficiency of the current urban form and employment. The following productivity analysis includes 3 steps of actions, which are:

1) Development of under-utilised land
2) Land use diversification within the 5 nodes
3) Redevelopment

5.3.1. Step 1: Development of under-utilised land

Following the response 2: regeneration and utilisation of under-used land, the plots of underdeveloped land within the node 2,4 and 5 are proposed for development following the UN-Habitat principles for sustainable neighbourhood planning, which recommends the following:

A land allocation ratio of 35 per cent for the street network, 15 to 20 per cent for public space, and 50 per cent for other land uses (developable land).

50 per cent of the under-utilised land, which is categorised as developable land, requires further classification according to the model of diversified land use using UN-Habitat principles for sustainable neighbourhood planning which recommends the following:

A land-use allocation ratio of 40 per cent of the built-up area for residential use, 40 per cent for mixed-use, and 20 per cent for commercial functions.

For the productivity analysis, an average number of 3 storeys for the new development was used. This number of storeys was used, referencing data on average building heights in Khorog to promote efficient, high-density urban fabric, which was also cross-referenced with requirements for earthquake-proof design standards.

Once the floor area was estimated, the effective area of 80% (area used for the job) was calculated for further application of the employment ratio.

Following the described principles, the productivity calculations for the newly developed neighbourhoods on the under-utilised or vacant land per node are as follows:

New development in the node 2: The development of 3 storey mixed-use neighbourhoods on 10,2 ha on the under-utilised land in Barakat can generate 3,780 jobs.

New development in the node 4: The development of 3 storey mixed-use neighbourhoods on 8,6 ha on the under-utilised land in Barakat can generate 1,593 jobs.

New development in the node 5: The development of 3 storey mixed-use neighbourhoods on 2,2 ha on the under-utilised land in Barakat can generate 2,890 jobs.

Therefore, the overall under-utilised land within the selected nodes is 30,8 ha, which is a considerable asset to introduce new neighbourhoods of mixed-use development. By applying UN-Habitat principles, the mixed-use neighbourhoods to be introduced on 15,6 ha to ensure sufficient space for streets and public spaces, can generate 8,265 jobs.

Nodes	Under-utilised land, area/ha	Developable land (50% of total under-utilised land), area/ha	Residential, area/ha	Commercial, area/ha	Mixed-use, area/ha	Jobs
Node 2	20,5	10,2	4,1	2,0	4,1	3,780
Node 4	8,6	4,3	1,7	0,9	1,7	1,593
Node 5	2,2	1,1	0,4	0,2	0,4	2,890
Total:	30,8	15,6	6,2	3,1	6,2	8,265

Table 2. Project phasing and participatory events conducted

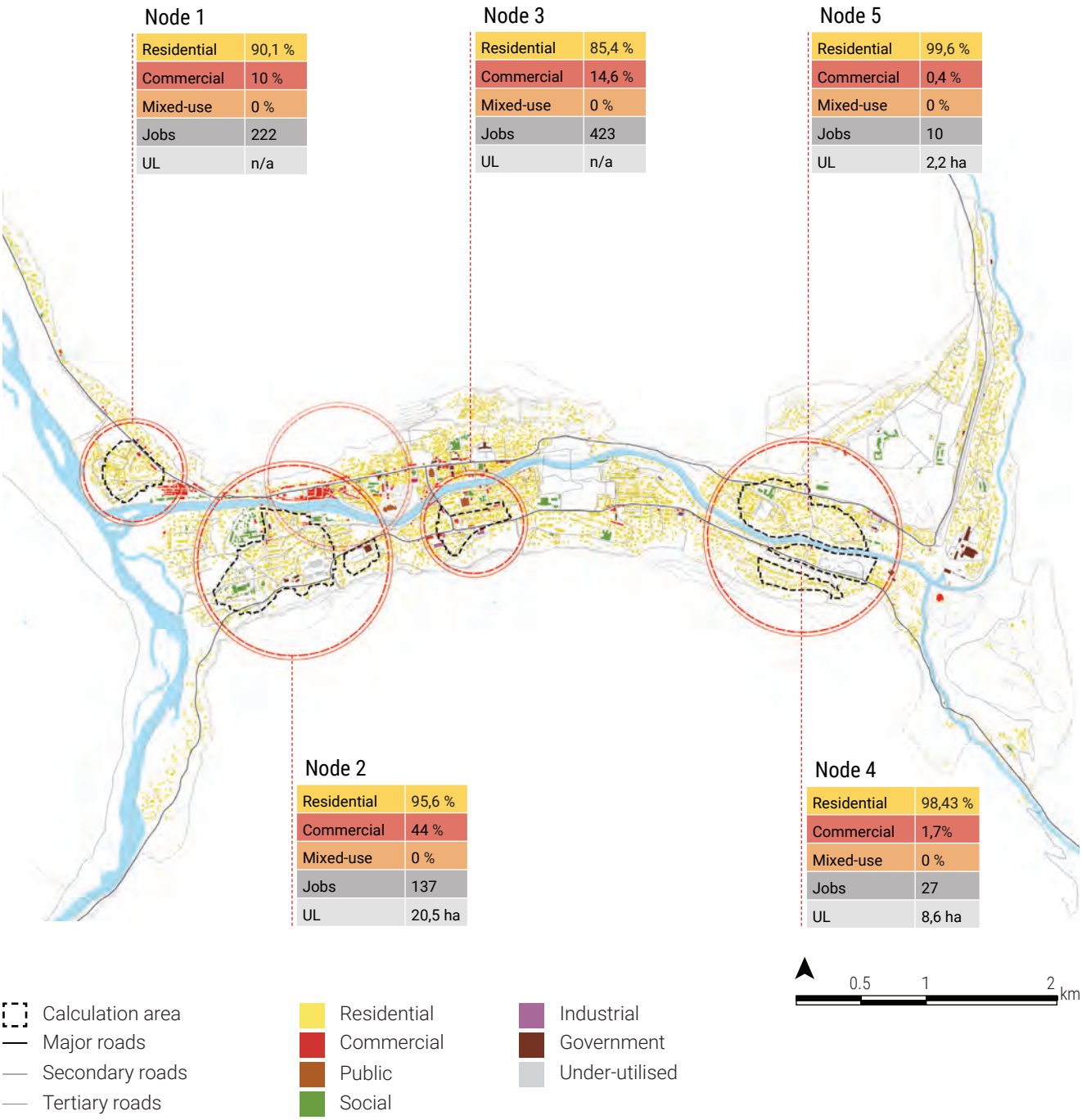


Fig 48. Current land use pattern

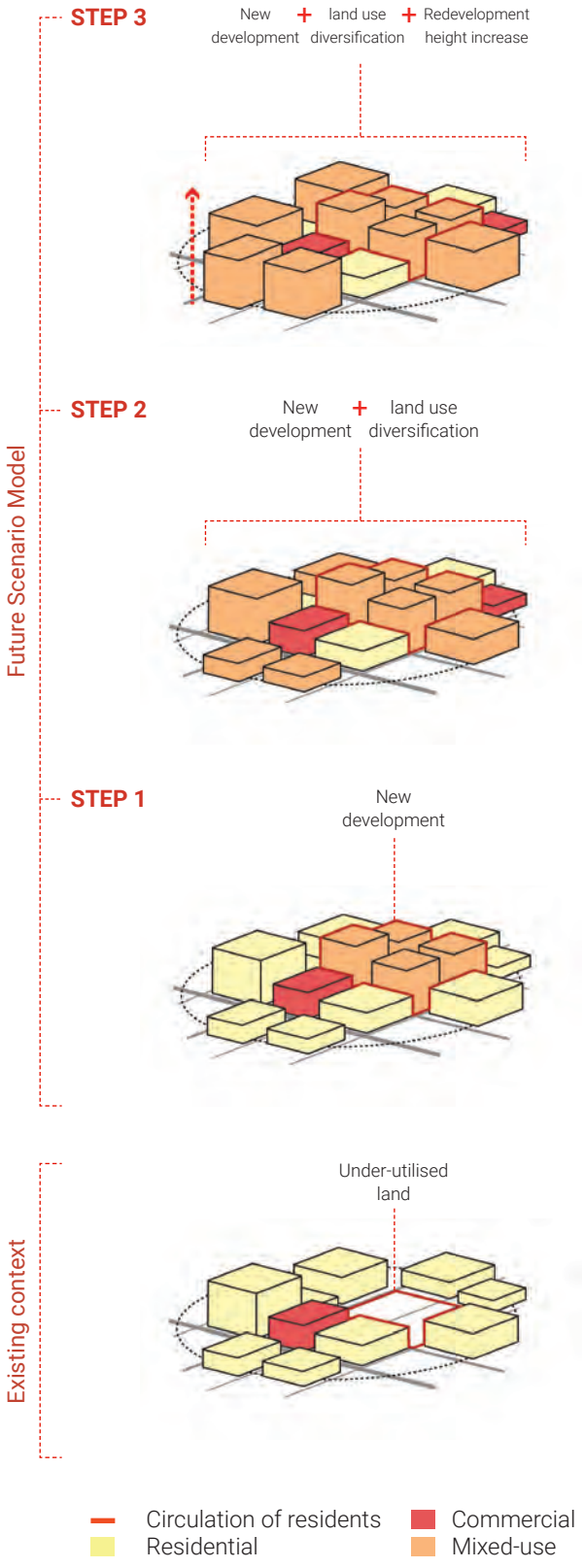


Fig 49. The 3-step process of productivity analysis

5.3.2. Step 2: Land Use Diversification

The second step assesses land use diversification of the existing built-up area within the selected nodes, and looks at the impact on employment.

In order to understand the current land-use ratio in Khorog, data from a topographic survey was used to determine the existing floor numbers. According to the results, Khorog's current built-up area is mainly residential (77.5 per cent). 8.4 per cent of the built-up area is used for public facilities (health, education etc) and 7.9 per cent is commercial. Government facilities and land for state use represents 2.6 per cent of the total built up area, whilst industrial sites account for 0.5 per cent.

Applying UN-Habitat's neighbourhood planning principles to the five selected nodes, changes the total land-use ratio in the city. After their application in the five nodes, residential land uses of the total built-up area of the city are reduced from 77.5 per cent to 62,8 per cent, commercial land use increases from 7.9 to 13.3 per cent. Whilst there is very limited mixed-use land allocation, the proposed adjustment and new development would bring the mixed-use land ratio up to 14.1 per cent of the total built-up area.

Applying the land diversification model to the five densification nodes will lead to increased employment in the city. As stated previously, assumptions are drawn from employment data in Khorog that are used to attribute an average number of jobs to each square metre of the built-up area. This is then differentiated by land use types in proportions drawn from the ratios proposed in the scenario model and upscaled to account for the application of the densification nodes.

If the land use ratios in the model are applied, the increased proportions of commercial and mixed-use land are predicted to generate an additional 4382 jobs.

These calculations provide an estimate of the potential economic impacts that would come from the recommendations detailed above. This analysis is designed to illustrate that even if densification of the current built-up area is not applied and only under-utilised land within the nodes is developed , the current urban pattern can function in a more efficient manner if principles of mixed-use development are applied and land use diversified. However, further densification and infill strategy will aid economic growth.

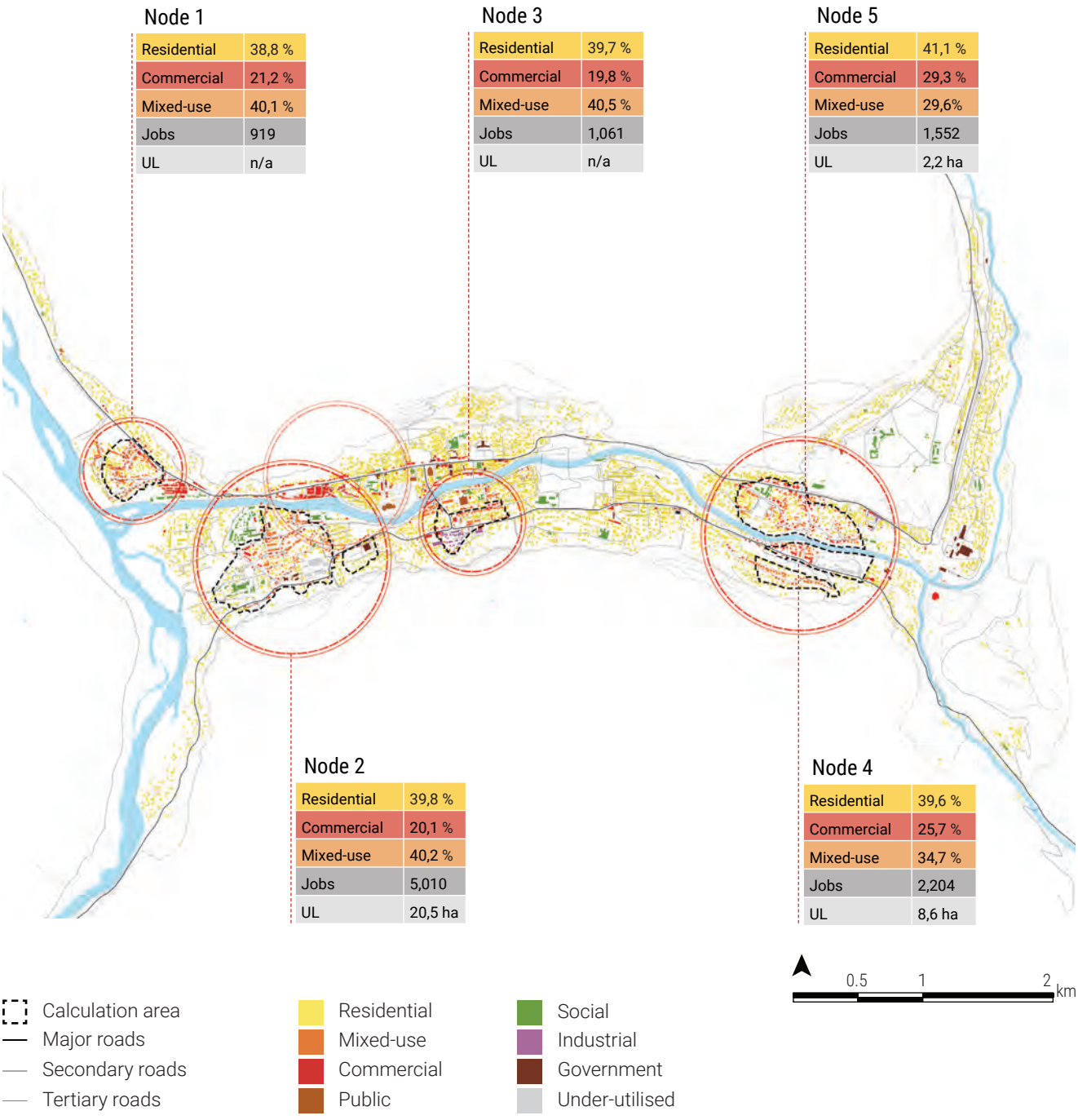


Fig 50. Proportions of land use types proposed in the densification nodes and projected job provisions

The specific approach to land-use diversification in each node is as follows:

Node 1: The proposal suggests doubling the area allocated to commercial land use and taking advantage of buildings with more than one floor for the promotion of mixed-use development, especially in areas near the main mobility axis. By diversifying the land uses, the potential number of employment opportunities provided in commerce could quadruple. Currently, the land use ratio of node 1 is 90.1 per cent residential to 9.9 per cent commercial, with no mixed-use allocations. This node currently generates approximately 222 jobs. By applying land use diversification in accordance with UN-Habitat's ratio principles, this node could be adjusted to comprise 38.8 per cent residential, 21.2 per cent commercial, and 40.1 per cent mixed-use land functions.

Therefore, as there is no under-utilised land in this node, by just applying land-use diversification, this node alone could generate a total of 919 jobs, an increase of 697. As there is no under-utilised land in this node, this land-use diversification is applied to existing buildings.

Node 2: The proposal suggests quadrupling the area allocated to commercial land use and utilising buildings with more than one floor to promote mixed-use development, especially in areas near the main mobility axis. Diversifying the land use in the area at the prescribed densities could provide a nine-fold increase in commercial employment provision. Currently the land use ratio of node 2 is 95.6 per cent residential to 4.4 commercial with no mixed-use allocations and generates approximately 137 jobs. By applying land use diversification to comply with the proposed ratios and densities, the node could be adjusted to comprise 39.8 per cent residential, 20.1 per cent commercial and 40.2 per cent mixed-use land.

Therefore, both the redevelopment of under-utilised land, and the land-use diversification within this node alone, brings the projected total of employment opportunities offered in this node to 5032.

Node 3: Currently the land use ratio of node 3 is comprised of 85.4 per cent residential to 14.6 per cent commercial with no mixed-use allocations and generates approximately 423 jobs. By applying land use diversification at the proposed ratios and densities, making use of buildings higher than a single storey for mixed-use development the area could be comprise 39.7 per cent residential, 19.8 per cent commercial and 40.5 per cent mixed-use land functions. This would generate an additional 638 jobs, increasing the area total to 1,061.

Node 4: This node is currently largely comprised of residential land (98.3 per cent) with a small proportion of commercial land use (1.7 per cent). The dominant typology in this node is single storey buildings, which makes increasing mixed-use space in existing construction impossible. Instead, the commercial land use can be increased to the UN-Habitat recommended ratio of 20 per cent. By diversifying the land use to increase commerce, the number of jobs generated in the sector will increase dramatically, reducing the need for residents to commute to the central area. Currently, node 3 offers approximately 27 jobs. By applying land use diversification, this could be increased to 677 jobs.

If under-utilised areas are redeveloped and the mixed-use neighbourhoods are introduced through land-use diversification, an additional 1594 jobs can be generated, bringing the projected total of employment opportunities offered in this node to 2204.

Node 5: As in the case of node 4, the urban typology of node 5 is also predominantly single storey. This suggests increasing the commercial land-use ratio for the current built up area and redeveloping the underutilised plots. As in node 4, increasing economic opportunities with land use diversification and development of under-utilised land in node 5 would reduce resident commuting into the city centre. Currently, node 5 has a ratio composition of 99.6 percent residential use to 0.4 per cent commercial use with no mixed-use development and generates approximately only 10 jobs. If land use diversification were applied to decrease the ratio of residential use to 41.1 per cent and raise commercial use to 29.3 per cent, with 29.6 per cent mixed-use, the changes could generate 1,552 additional jobs.

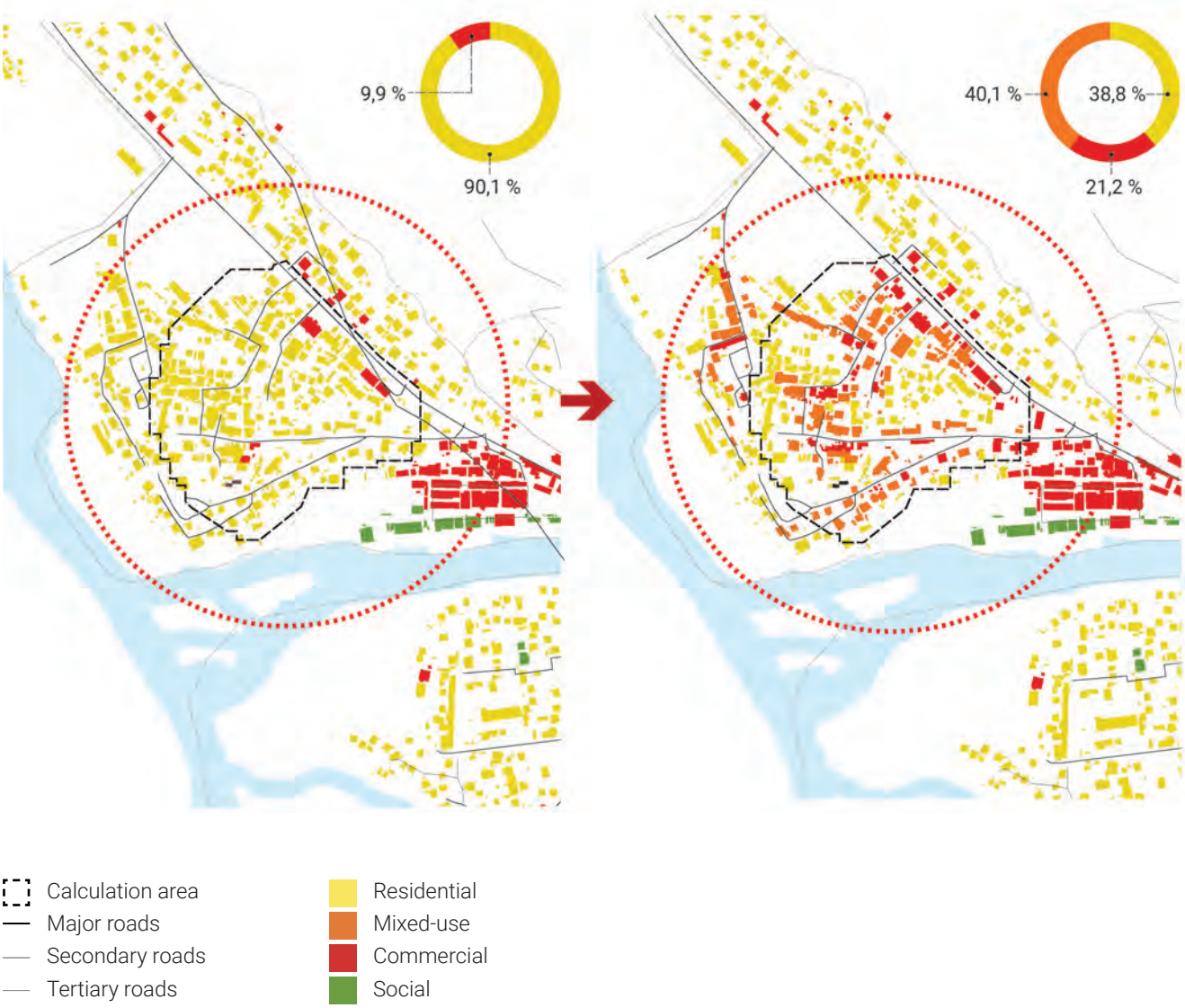


Fig 51. Sample of land use diversification applied to the area of node 1

Nodes	Residential, (m^2)		Commercial, (m^2)		Mixed-use, (m^2)		Jobs	
	Current	Future	Current	Future	Current	Future	Current	Future
Node 1	65272	28105	7212	15331	0	29047	222	919
Node 2	96844	40270	4460	20359	0	40674	137	5032
Node 3	80170	34184	13750	17028	0	34884	423	1061
Node 4	49331	20236	862	13138	0	17699	27	2204
Node 5	83908	34714	335	24780	0	24957	10	1552
Total	375525	157509	26619	90636	0	147261	819	10768

Table 3. Summary data showing current and proposed m2 of node area per land-use once land use diversification is applied and its impact on jobs

5.3.3. Step 3: Redevelopment

The above calculations are based on land-use diversification of the current built-up area, as well as new development of under-utilised land. The new development on under-utilised land is based on sustainable neighbourhood principles, and therefore suggests 3 storey buildings that have the land-use ratio (40;40;20) described above.

As well as the new development of the under-utilised land and land use diversification, the third step to densify the existing building up area is recommended. This involves increasing existing building height to 3 storeys.

The resultant proposal specifies that the heights of newly developed and redeveloped areas should not exceed three storeys. This was determined to ensure a high density is achieved with typological integration that will not disrupt the existing street-to-building proportions. The employment ratios are then applied, using the same calculation method and model of diversified land use as the previous productivity assessment.

Although this assessment is a useful guide to indicate the potential impacts of land-use diversification, redevelopment, and densification on employment, spatial changes require support from non-spatial mechanisms to promote long-term economic sustainability most effectively.

The productivity calculations for each node based on the redevelopment are as follows:

Node 1: With greater height contributing to an increased overall floor area, and diversified land use ratios for greater mixed-use development, redevelopment in this node could quadruple the existing commercial floor area. Commercial and mixed-use development would be focused most prominently in the areas adjacent to the main mobility axis. The increased commercial area could result in an additional 1,689 jobs, greatly increasing the total in the area to 1,911.

Node 2: Before redevelopment of existing built-up area is applied in this node, simply diversifying the existing land-use and developing the under-utilised plots could greatly increase the number of jobs provided in the area from the current figure of 137 to a total of 5,010. The further redevelopment of the current urban form can generate an additional 1353 jobs in commercial developments and 1286 jobs in new mixed-use developments. Therefore, if the approaches are combined to diversify and densify the entire nodal area with higher buildings, the total number of jobs offered in node 2 could be increased to 6,338.

Node 3: This node already contains a number of sites allocated to public services, commercial and industrial activities. If the 3 storey densification is applied to the overall node, it could provide an increased total of up to 2,219 jobs.

Node 4: As node 4 is currently dominated by single storey construction, land-use adjustments and increased building heights in the existing, low-density development areas of this node could provide an increased total of 1,460 jobs, reducing the need for residents to commute to the city centre for work. Increased building heights, land-use readjustment, together with the redevelopment of the under-utilised areas, means that this node can generate 2,818 jobs in total.

Node 5: As in node 4, increasing building heights of the already adjusted land-use in the existing, low density development areas in this node will have a major impact on employment provision. The number of employment opportunities would increase from 10 to 2,608, reducing the need for residents to commute to the central area.

Combining the strategies of densification of under-utilised land and land-use and building height adjustment, this node could generate a new total of 3,013 jobs.

Nodes	Residential, (m^2)		Commercial, (m^2)		Mixed-use, (m^2)		Jobs	
	Current	Future	Current	Future	Current	Future	Current	Future
Node 1	65272	61325	7212	31370	0	61452	222	1911
Node 2	96844	83559	4460	43975	0	83613	137	6338
Node 3	80170	70942	13750	36375	0	71504	423	2219
Node 4	49331	47904	862	23718	0	47495	27	2818
Node 5	839	84981	335	42180	0	85169	10	3013
Total	375525	348711	26619	177618	0	349233	819	16299

Table 4. Current and projected employment opportunities in the five densification nodes once strategies of under-utilised land development, land-use and building heigh readjustment is applied

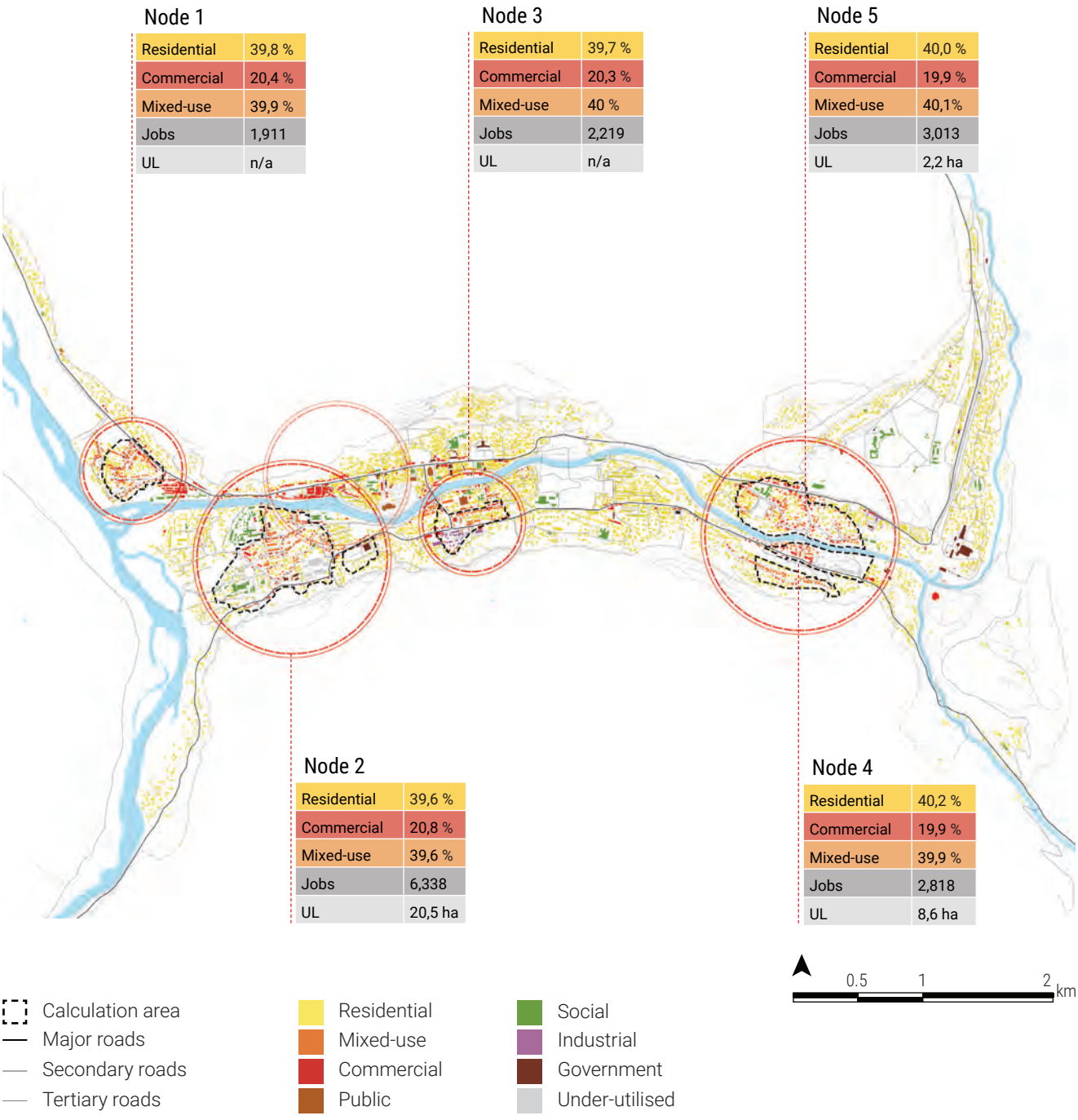


Fig 52. Proposed land use after application of nodal densification

5.4. POPULATION DENSITY

Following the strategic recommendations outlined in this report, rebalancing residential and mixed-use functions is designed to counteract the prevalent monofunctional development trend in the city and, thereby, produce a number of beneficial impacts on economic productivity, connectivity and social equality. The increased mixed-use development will be achieved in the five selected nodes with targeted infill strategies, new development on under-utilised lands and increased building heights. This will foster the gradual transformation of Khorog into a more balanced urban system that is functional, integrated and connected.

The strategic densification process would produce a well-distributed density increase, and provide increased opportunities for housing production, on safe land, to accommodate both the projected population growth and environmental migrants relocating from the hazard zones. Moreover, it would provide the conditions for more integrated and widespread social infrastructure and service supply, as well as employment opportunities, ensuring equal access to the opportunities of the city for a much greater proportion of the population.

In response to this, a population density forecast has been developed to assess the impact of the densification nodes in Khorog. This provides broad projections that identify the potential numbers that can be accommodated in future in Khorog.

The density standard applied in all the selected nodes is 125 people per hectare (125 pp/ha). Although UN-Habitat's five principles of sustainable neighbourhood development suggest a density of 150 pp/ha, the projection has used the highest density figure currently found in Khorog (125 pp/ha) to provide context specific comparison. As this density is matched in existing conditions, it is considered more realistically imaginable and contextually suitable in the existing city structure.

The five nodes currently accommodate a collective total of 5,315 people. According to the analysis conducted, if the average density standard of 125 people per hectare is applied, the nodes could collectively accommodate an additional 13,888 people.

Node 1 could accommodate an additional 1,684 people which would increase the total to 2,177. With the application of the redevelopment strategy and land use diversification, the population of this area could almost be quadrupled.

Node 2 can accommodate the highest population increase of 5,511. When added to the current nodal population of 1,906, this would total 7417 people. Node 2 provides significant opportunities for densification on the three plots of under-utilised land it contains, which comprise a total of 20.5 hectares.

Node 3 does not have available under-utilised land for regeneration. However, the current low density, location and services offered suggest that gradual redevelopment and infill on low density lots could be deployed to increase density in the area. According to the analysis, a redevelopment policy promoting densification to a standard of 125 pp/ha would double the population to a total of 1,759 people.

Nodes 4 and 5 both include under-utilised land that could be regenerated. The low current density of node 4 also provides opportunities for redevelopment and infill. Node 4 offers 8.6 hectares of under-utilised land, which could be redeveloped to increase the current population by five times the current amount when the same density standard is applied. Node 5 includes 2.2 hectares of under-utilised land that could increase the population by three times the current amount if redevelopment is deployed at the prescribed density standard. Together, zones 4 and 5 could accommodate an additional 5,734, which would raise their collective total population to 7,850.

Nodes	Total current number of people	Total number of people after implementation of strategic recommendations
Node 1	493	2177
Node 2	1906	7417
Node 3	800	1759
Node 4	693	3368
Node 5	1423	4482

Table 5. Current and proposed population figures in the five densification nodes

Fig 53. Central marketplace , May 2021

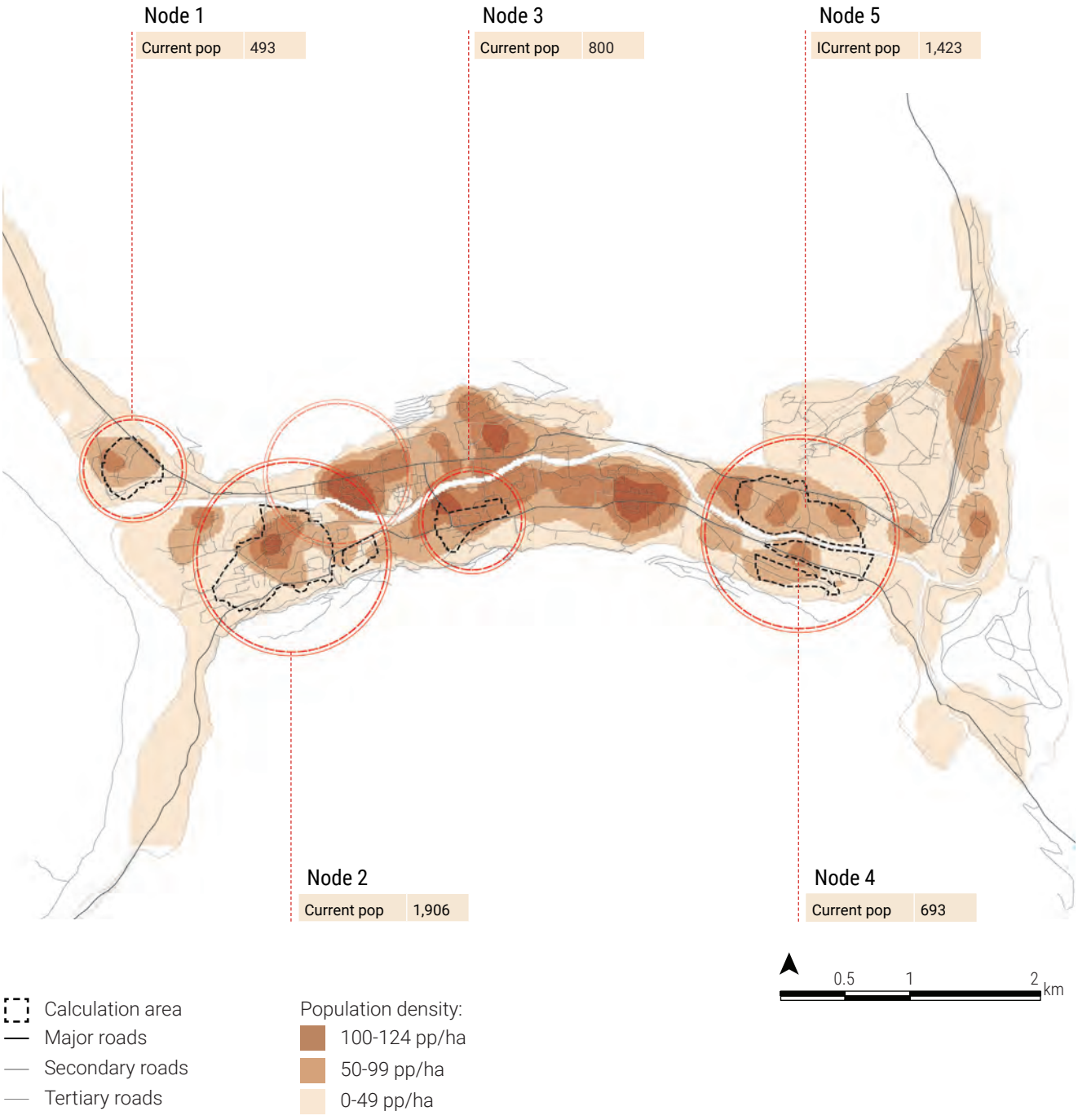


Fig 54. Current population densities

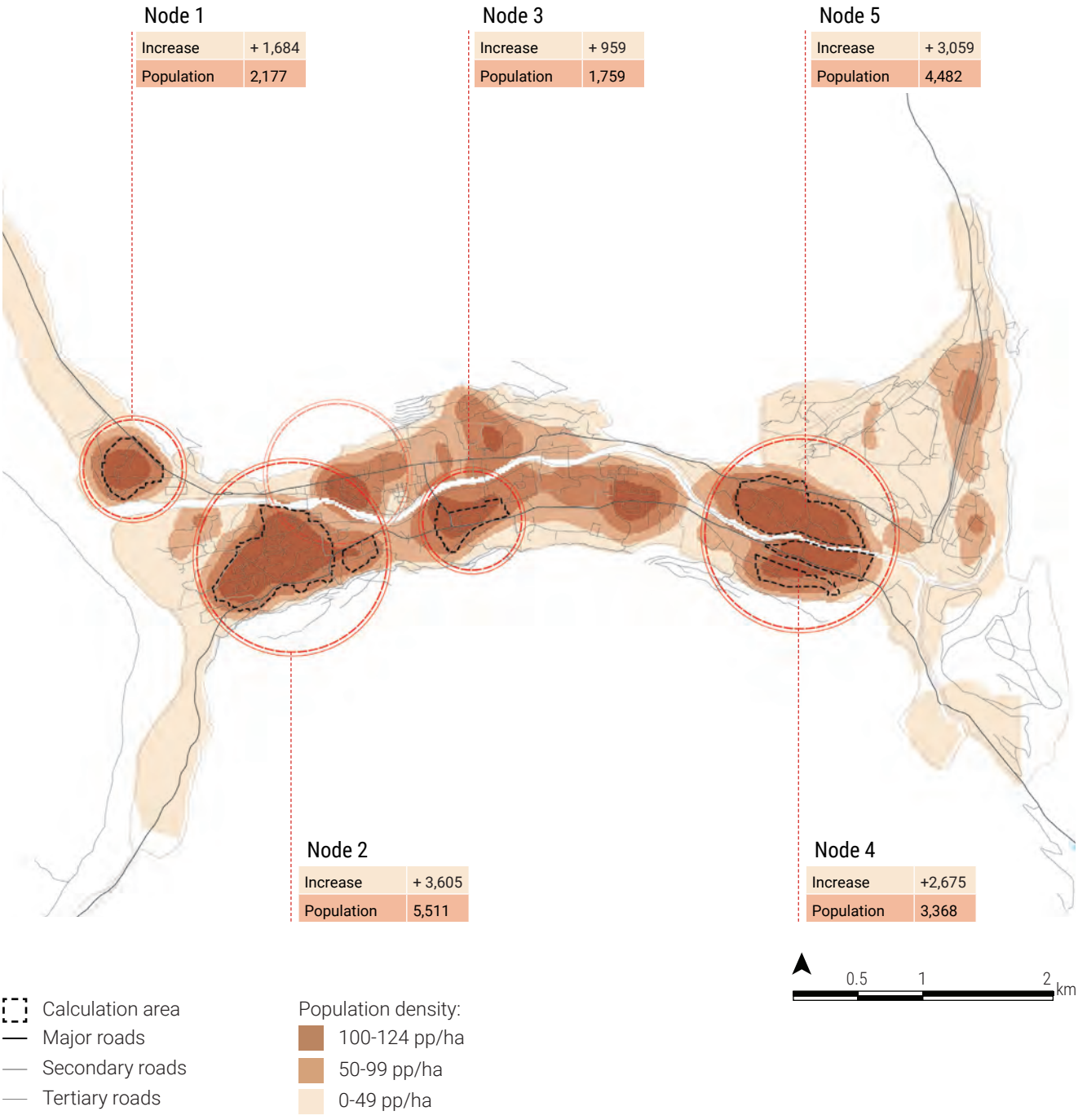


Fig 55. Proposed population densities after application of nodal densification

Fig 56. Medium rise housing from the Soviet times, May 2021

6

URBAN DESIGN RECOMMENDATIONS

This chapter focuses on key elements of urban design that would catalyse the structural transformation of the city in accordance with the strategic recommendations and actions outlined in chapter 2 . While the first phase of the project has defined the key area-based actions, the second phase will guide the process of their application with detailed propositions for urban design interventions supported by recommendations for regulatory mechanisms such as urban design guidelines.

These guidelines will focus on the design of streets, open spaces and buildings to promote compact, sustainable, and accessible development of all. The redesigned street grid will create integrated neighbourhoods with efficient, accessible, safe housing and sufficient numbers of jobs, as projected in the scenario models. A variety of open spaces, ranging from a large wetland park in Tem to small pocket parks within the urban area, will serve the entire city of Khorog and the smaller areas within individual neighbourhoods.

This chapter outlines the correlation between strategic recommendations and design proposals, which are aligned in such a way as to contribute both to the achievement of a comprehensive citywide transformation and to address multiple community-level objectives with an inclusive decision-making process. The following proposals for urban design interventions combine the practices of architecture, planning, participatory design, and landscape architecture to increase the functional qualities of the physical environment at a range of scales; from the streetscape, to the pocket park, the block, through to the larger neighbourhood.

Although elements of urban design are integrated in all the responses detailed in this report and play a vital role in supporting the proposed actions, four key principles of urban design have been selected for further development here. These four principles were selected for their applicability, importance, and interrelation with the proposed spatial strategies for Khorog. They are most notably relevant to responses 1-4.

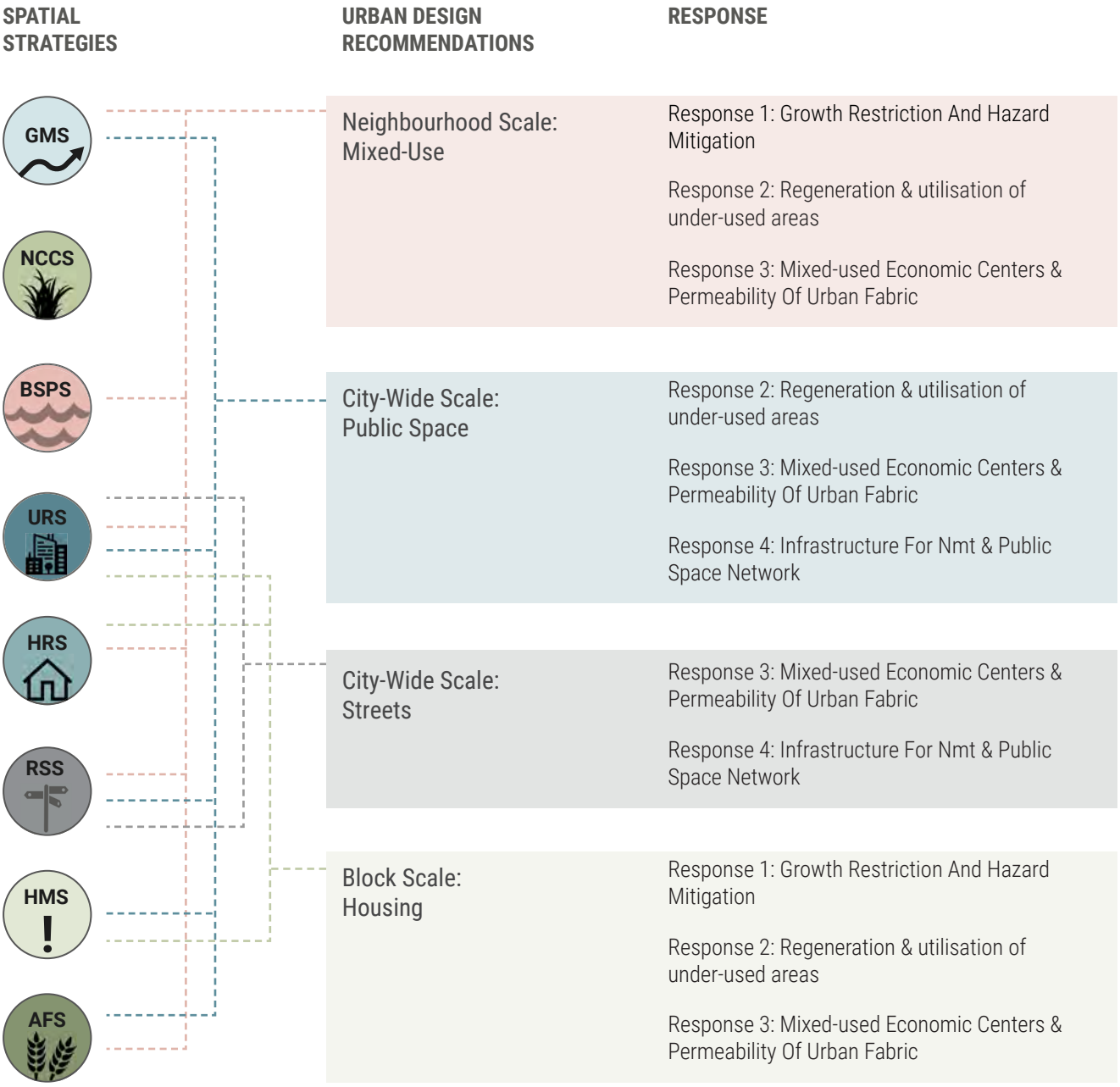


Fig 57. Relationship between the proposed eight strategies, six responses, and four urban design recommendations

6.1. NEIGHBOURHOOD SCALE URBAN DESIGN - MIXED-USE DEVELOPMENT

The following design interventions entail the physical application of the UN-Habitat principles for sustainable neighbourhood planning in the context of Khorog, accounting for particular local features. The introduction of these principles to produce more sustainably planned neighbourhoods will significantly contribute to the achievement of the six strategic recommendations. The plots of under-utilised land within Tabobatkhona, Barakat, Andarsitez and Khorogi Bolo have been initially selected as areas to pilot the proposed process to create compact, integrated and connected neighbourhoods. Figure 55 shows a projected transformation in the area of the former bread factory into a mixed-use neighbourhood with pedestrian orientated infrastructure. [i]

According to the current urban development rules and regulations (GNiP/ ГНиП РТ 30-01-2018) comprehensive urban regeneration (specified in legislation as comprehensive urban reconstruction) should be carried out to ensure sustainable development of settlements. The current plots of under-utilised land within the current built up area, not exceeding 10 ha each, can be selected for targeted "reconstruction" according to current requirements on site dimensions. Moreover, current regulations (GNiP/ ГНиП РТ 30-01-2018) specify that the regeneration process should utilise "contemporary standards" for density and address areas of non-effective use and/or territories recognised as inconvenient (such as former industrial, communal, warehouse buildings, etc.). The current planning regulations support the application of the recommended principles and site selection.

The requirements align with UN-Habitat recommendations on regeneration and strategic densification, which should consider the following principles in the detailed design proposals:

6.1.1. Diversity of Land Uses

Land use mix is one of the important measures of urban pattern development and it refers to the diversity of land uses within an area. Land use diversification is aimed to develop a range of compatible activities and functions close together in appropriate locations, fostering the creation of local jobs, reducing car dependency and encouraging pedestrian and cyclist traffic. In addition, the diverse land use pattern reduces urban fragmentation, providing a better accessibility to services and promoting diversified, socially equal and thriving communities in economically viable ways. The urban design principle of mixed-use development is closely linked with the UN-Habitat guidelines for Resilient Streets and Public Space Networks which are further linked to the recommendations detailed in sections 6.3 and 6.4.

The proposals for neighbourhood redevelopment should ensure a diversity of allocated uses in accordance with the UN-Habitat principles as specified in the XX. It is suggested that at least 40 per cent of floor space is allocated for economic use in the new neighbourhoods. Between 20 and 50 per cent of the residential floor area should be reserved for low-cost housing, ensuring a social mix and adequate housing accessibility.

Currently, there is no clear definition of mixed-use development in the current norms and regulations of Tajikistan. The areas considered for intervention are aligned with the official guidelines, however, the definition of mixed-use development should be reformulated to include the recommended functionality guidelines and use ratios.

6.1.2. The Compatibility of Different Land Uses

While promoting the diversity of uses within an area, it is important to ensure that the land use mix is balanced, noise and pollution levels are retained at a minimal level. Mixed-use development should be arranged to ensure compatibility between uses, both within the new redevelopment quarter and adjacent areas.

The allocation of potential uses should be detailed according to a compatibility analysis during the development phase of demonstration projects. The potential functions to be allocated within the mixed-use neighbourhood should be defined according to the local requirements and needs, and validated during the participatory session with communities, local entrepreneurs and professional society to provide clear design guidelines on land use mix.

6.1.3. Promotion of Adequate High Density

To ensure the efficient land use and alleviate urban sprawl, it is necessary to achieve high density, which is the foundation of a sustainable neighbourhood. High density essentially means a concentration of people and their activities. The density indicators should applicable to the local context.

The proposed redevelopment on the under-utilised lands should allocate new low and mid-rise housing (low-rise: 1-3 storeys, mid-rise: 4-5 storeys) to achieve an approximate density of 125 pp/ha, which is the highest indicator in Khorof and can be found in the central area of the city. Such density achieved by 3 storey development is positively perceived by the communities unlike the high-rise development and provides opportunities to create a comfortable and human scale environment.

6.1.4. Developing a Variety of Housing Typologies

While promoting new mixed-use development, it is important to provide a variety of lot sizes and housing types to cater for the diverse housing needs of the community, at densities that can ultimately support the provision of local services. The development of housing typologies should consider local ways of living and include comfortable spaces for women and youth, communal garden/ to grow own food, etc.

The development of housing typologies should aim to create a human scale environment which is comfortable to use. The current recommendations promote an average number of storeys of 3 to ensure harmonious vicinity to adjacent areas. Moreover, introducing requirements that promote low and mid-rise development will contribute to the protection of natural environment and natural assets such as viewpoints from the city.

6.1.5. Enhancing Local Identity

Urban design interventions should consider local culture to enhance local identity. Local artists and entrepreneurs significantly contribute to the formation of characteristics of a place and should have opportunities for expression. New development and land-use diversification should provide an area sufficient for creative and economic activities to form an active urban street elevation.

Apart from providing opportunities for self-expression and businesses, introduction of courtyards with locally made urban furniture (such as shelter, seating, lighting, etc.) and child-friendly spaces should create a “sense of a place” and build a better social cohesion. The design recommendations imply active participation of local artists together with the communities in design workshops during the further stages.

6.1.6. Promote a Better Connectivity

The mixed-use neighbourhood should provide an interconnected network of streets that facilitate safe, efficient and pleasant walking, cycling and driving experiences. The developed neighbourhood should demonstrate the sustainable mobility pattern as a result of redevelopment of the street section as described in 6.4.

6.1.7. Building upon the Existing Assets

While introducing regeneration strategy, the detailed analysis of pre-condition should be conducted to define the current land potential. Some of the areas which are proposed for strategic regeneration contain abandoned structures (such as warehouses and/or the hangar complex) that can be partially redeveloped and repurposed as urban greeneries, sheltered community gardens/areas for urban agriculture and/or flexible gathering spaces.

The detailed assessment of preconditions during the phase of detailed project design should include quality assessments for these structures.

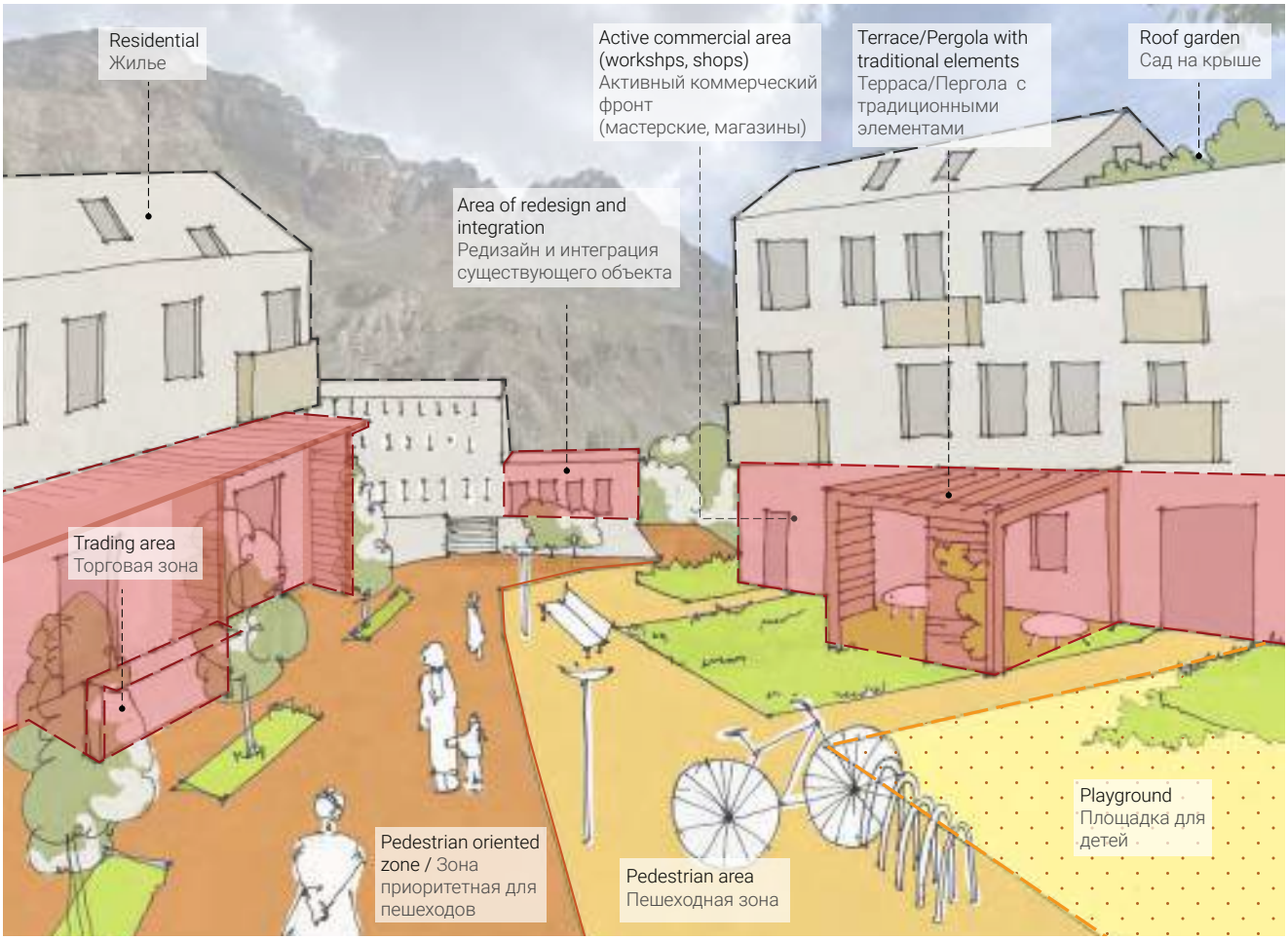


Fig 58. Potential transformation of former bread factory area

Fig 59. The site of the former bread factory

6.2. BLOCK-SCALE URBAN DESIGN - HOUSING

IThe mixed-use urban design interventions function at a neighbourhood-scale. In order to ensure the success of these recommendations across scales, it is important to consider the implications of interventions at each level. At the block scale, housing provision is the most important consideration.

The urban morphology of Khorog is composed of several architectural and urban typologies: the regular urban pattern derives from Soviet era development, there are areas of vernacular Pamiri houses, and fragments of contemporary development.

While current legislation outlines some requirements for the block design, it is important to ensure that these requirements are extended to form broader design guidelines. Block-level recommendations should be developed to complement the proposed actions at the neighbourhood level.

The introduction of new housing concepts can facilitate the compaction of urban structure with strategic densification. New housing concepts must learn from local best practices and promote healthy, energy efficient building typologies with low operation costs, causing minimal environmental impact. They should merge contemporary structural provisions and cultural identity to achieve affordable solutions. New housing concepts can support the strategic recommendations with the inclusion of design considerations such as:

6.2.1. Forming Vertical Zoning

To support the implementation of mixed-use neighbourhood concept, the vertical zoning should be applied to buildings to reserve lower block levels for economic activities, particularly at the street front, which will provide easy access to local employment opportunities and activate the street edge.

The chapter 5.3.2 suggest the increase of number of storeys up to 3 to ensure the introduction of mixed-use development. The allocation of the first storeys for public uses will contribute to the creation of new urban centralities and major economic/transport corridors (central loop), where there is a demand for street-front activities.

6.2.2. Ensuring Safe and Easy Access

Apart from active urban front, the building block should ensure safe and well-designed access to buildings, adapted to the needs of Persons with Disabilities to ensure functional circulation. Moreover, internal courtyards should form a comfortable space design for all the residents, promoting inclusive environment at the neighbourhood level and strengthening the city-wide hierarchy of public spaces.

6.2.3. Strengthening the Local Identity

At the block level, designed facade contributes to the attractiveness of the area and aligns with the identity of the city. The further detailed projects should ensure that all building elevations are considered and designed as an integral part of the overall development.

Traditional patterns and shapes might be included in the design proposals to be defined during the participatory sessions with local artists and communities during the next stages of the project.

6.2.4. Taking into Account Sustainability Considerations

The consideration on sustainability should be included in both project development and construction. The building design might include techniques for the most effective use of the sun, promotion of solar energy, minimisation of mechanical ventilation, block-level water sensitive design, etc. In addition to design techniques, the utilisation of local materials should be promoted for construction.

The design guidelines should emphasise the importance if sustainability considerations and include the best practices of the region.

6.2.5. Ensuring Hazard Mitigation

According to the city diagnosis, some areas of the city (within the yellow zone as specified in the section 3.2.1) will require hazard mitigation measures introduced at the block level. Hazard mitigation measures at the block level should include earthquake-proof design (flexible foundations and meta-structures, structural reinforcements, earthquake resistant-materials, etc.), adjacent internal "sponge" courtyards and/or bioswales, etc.

6.2.6. Defining Block Management and Maintenance Strategy

The design of the building and the way that it is managed is influencing the extent and cost of maintenance

requirements. To ensure efficient use of investments and account for the future maintenance requirements, block management and maintenance strategy should be established at the same time with design development. Establishing a maintenance strategy is particularly important when developing affordable housing and analysing mortgage mechanisms.

The current requirements for affordability should be expanded and supported by the maintenance strategy. The proposals for the efficient and affordable solutions should be conducted during the development of the housing typologies as a part of the further phase of the project.

6.3. CITY-WIDE URBAN DESIGN - PUBLIC SPACES

There is no comprehensive definition of public space in the current legislation (GNiP/ ГНиП РТ 30-01-2018). Generally, the definition of public space is inferred only in mention of natural landscape, green spaces and/or recreational areas. It is recommended that the local definition be adjusted to reference the UN-Habitat Global Public Space Programme's definition of public space which refers to all open areas or places, that are accessible to all people, regardless of gender, race, ethnicity, age, and socio-economic background.

Despite the lack of definition of public space, the legislation for public spaces covers the necessary requirements such as accessibility, linkage with the citywide green system, access for PwD, etc. The future design guidelines for public spaces should be developed in accordance with strategic recommendations and include the following considerations:

6.3.1. Regeneration of the "Ghost" Spaces and Allocation of Vocational Functions

The project proposal suggests including under-used land sites, and current "ghost" spaces in the public space development strategy, allocating specific complementary vocational functions to certain spaces depending on their location and desired future scenarios.

The small plots of under-utilised land, especially adjacent to social facilities, are proposed for "pocket parks", which are small green spaces linked to the comprehensive public space network. An example of such an intervention can be viewed in figure 59 , which provides a projection of a child-friendly space developed on the plot adjacent to the early childhood development centre. Features such as locally made furniture and employing place-making activities in the process of implementation can provide a collective engagement with public spaces such as this.

Fig 60. High rise housing block

6.3.2. Considering Public Spaces for Hazard Mitigation

Among the vocational functions, "sponge" public spaces with hazard mitigation measures are suggested in the areas of Sharifobod, Dashti Poyon, Markazi, Khichordev and Tem, promoting nature-based solutions to hazard mitigation. These public spaces should include permeable surfaces such as rainwater gardens, vegetated areas, or wetlands and also introduce natural storm water filtration to increase the quality of groundwater, which is particularly important in the areas that are prone to groundwater flooding. The higher the number of "sponge" public spaces in the city, the more impact there will be on natural retention and resilience. A good coverage of open and permeable surfaces will significantly reduce flood risk.

Open green spaces may include designs for interconnected channels and retention ponds which can contain and filter water, support urban ecosystems, boost biodiversity and create cultural and recreational opportunities on landscaped banks. Such interventions are specifically proposed for the area of Tem, where there is an opportunity to create a unique wetland park to retain excess water.

Bioswales should also be promoted, in addition to introducing more context-specific vegetation with greater absorptive capacity. The revitalisation of wild rosehip plantations was pointed out during the "Discovery and Understanding" workshop as a necessary intervention that can support the Hazard Mitigation Strategy at the neighbourhood level.

6.3.3. Slope Landscape Design

The strategic recommendations promote the integration of blue, green and grey infrastructure with urban design and slope landscape planning, particularly in the areas of Andarsitez, Barakat, Khufak, Gulobod, Imomobod, Khichordev, Saifullo Abdulo, Tirchid, Tabobatkhona, and between UCA and Khorugi Bolo. Landscape design on slopes will address urban fragmentation, increase the diversity of public spaces and support hazard mitigation efforts in the city.

6.3.4. Promoting Activities and Placemaking

While public spaces offer an opportunity to reintegrate the natural features of the surrounding landscape into the urban fabric, the proposed activity spaces will also create further opportunities for social interaction, increasing the social cohesion in the neighbourhoods. Promoting these types of spaces is particularly relevant in the area of Khorugi Bolo adjacent to UCA.

Alongside design interventions, placemaking activities are suggested, to engage communities and students with more university activities that are opened to the public. By doing so, UCA will become more integrated with the surrounding communities, supporting the "University town" vision.

Fig 61. Existing pocket park in the central area of Khorog

Fig 62. Potential child-friendly space developed on the plot adjacent to the early childhood development centre

Fig 63. The current condition of an area adjacent to the early childhood development centre in the central are of the city

6.4. CITY-WIDE URBAN DESIGN - STREETS

The Resilient Street Strategy proposes a set of interventions on street design to ensure the major streets of Khorog provide safe, accessible, and healthy travel for all users of the road network, including pedestrians, cyclists, and vehicles.

The current legislation provides clear recommendations for the road network design and road hierarchy, however, it does not provide guidelines for street network design. Street networks require guidelines to ensure they function as public space that responds to the community context, with multi-modal classification by function, traffic speed differences, and affordances for all road users. Implementing inclusive and greener streets and considering them as part of the public space network will promote equity and significantly improve resident quality of life.

It is suggested that UN-Habitat principles are applied in the design for the strategic regeneration areas (Urban Regeneration Strategy), ensuring the allocation of at least 30 per cent of land to the neighbourhood street network, with at least 18 km of total street length per km2.

The current street network of Khorog can be redesigned without the disrupting or demolishing the existing structural elements. Figure 61 shows the application of the Resilient Street Strategy in the central area of Khorog, demonstrating that the existing capacity of the street is sufficient to accommodate the proposed interventions that are designed to promote non-motorised mobility in Khorog. The proposed interventions should be implemented according to design guidelines, which would include recommendations on street network design and street classification. Greater focus on the redesign of streets and establishment of contemporary guidelines is important as the street network will shape the future urban structure which, in turn, sets the development pattern for blocks, streets, buildings, open spaces and landscapes. Urban design recommendations for the street network should include the following considerations:

6.4.1. Ensuring a Comfortable and Inclusive Environment for all Street Users

The street redesign should ensure that streets provide an inclusive environment for use by all social groups, of all ages and abilities. That implies considering both technical aspects to make the streets more inclusive (tactile walking indicators, ramps and curb cuts, accessible pedestrian signals, etc.) and functional aspects (more vegetation to reduce noise, more child-friendly spaces close to social facilities, etc.).

6.4.2. Allocating Efficient and Comfortable Space for Cycling and Walking Activities

Depending of the road classification, it is suggested to allocate sufficient space for cycling lanes, addressing safety concerns by introducing green buffer zones and refuge islands between the transit lanes and the cycling path. In several areas of Khorog it is suggested that space is reserved for cycling lanes within existing pedestrian walkaways where the wide street surface can accommodate them.

To ensure streets provide comfortable public spaces that encourage walking and cycling, signage, street furniture, cycling facilities (bicycle parking, repair stations) and pedestrian infrastructure (crosswalks, ramps, central crossing islands, curb extensions, pinchpoints, etc.) should be designed and installed.

6.4.3. Regularising the System of Public Transport for Comfortable Use

To ensure the regularisation of public transportation and provide a more comfortable operational experience for passengers, sheltered public transportation stops should be designed and constructed. The city diagnosis identified the location of public transport stops, which should be further considered in the detailed plans.

Depending on the road classification, separate public transport lane should be introduced. Considering the compactness of Khorog, the separate lane may be possible only along the major route (central loop), as highlighted in the strategic recommendations.

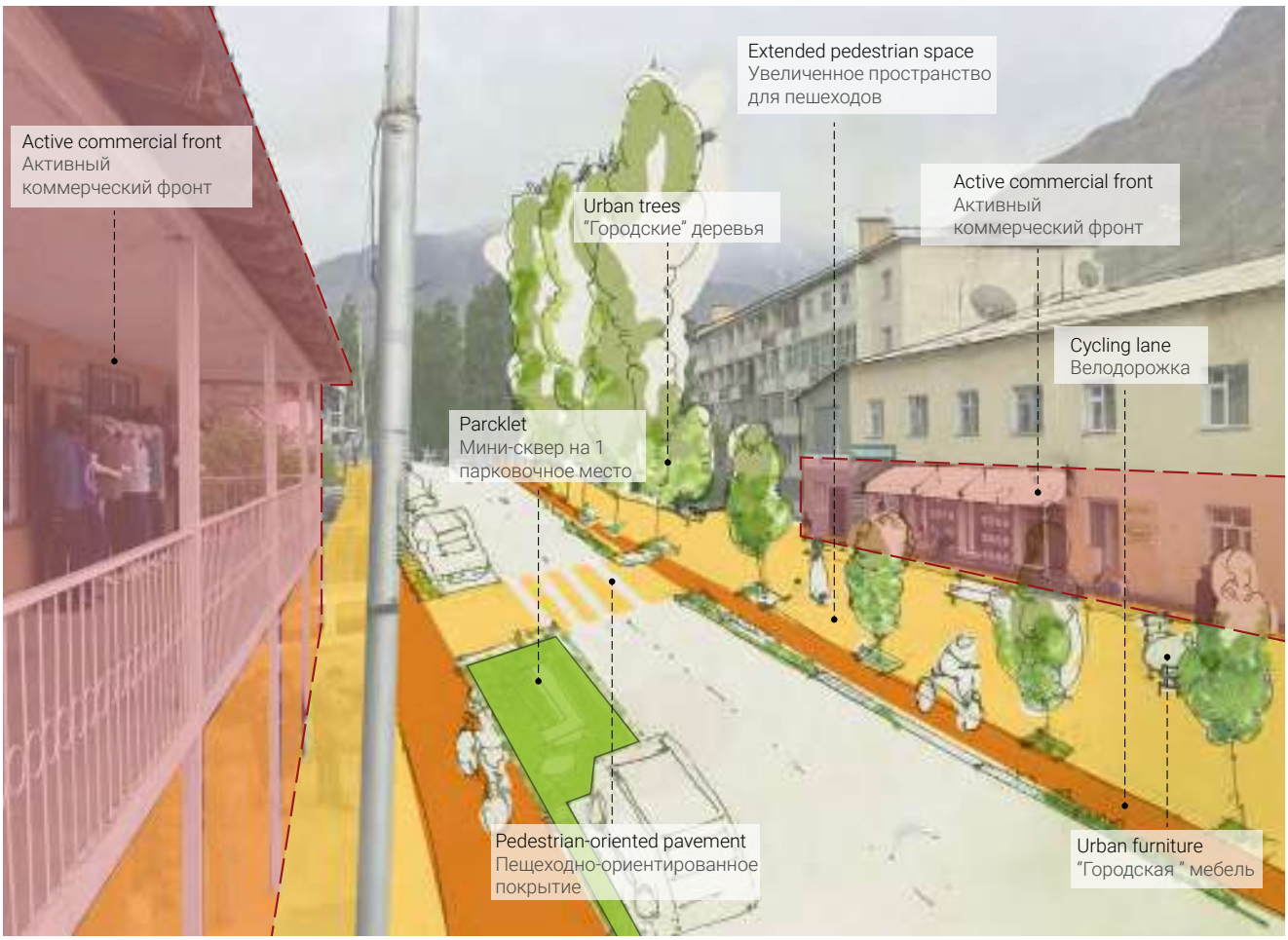


Fig 64. Potential street redesign

Fig 65. The current condition of the street in the central area of Khorog

Fig 66. View on University of Central Asia (UCA) from Imomobod

7

CONCLUSIONS AND THE WAY FORWARD

The City Profiling exercise of Khorog constitutes the primary study of the Integrated Spatial Plan for Environmental and Socio-Economic Resilience, developed under the Khorog Resiliency Programme of AKAH and executed by UN-Habitat. The Khorog City Profile comprises the 3 steps/parts together with complementary reports of the Participatory Approach, Capacity Needs Assessment, and Legal Assessment that have arisen from a successful collaboration between the UN-Habitat, AKAH and Government of Tajikistan.

Aimed at providing a planning direction towards a more sustainable and resilient urban development in Khorog, the City Profile identified the challenges and opportunities in the city (Part 1) to have a better understanding of Khorog, developed evidence-based spatial analysis (Part 2), and finally consolidated the challenges and identified key spatial and non-spatial strategies by which to approach them (Part 3). The City Profile Part 3, the final report of a series of seven, unifies the findings of outcomes from a process of analysis and diagnosis in four key thematic areas of Environmental, Socio-Economic, Infrastructure and Basic Services, and Institutional Resilience in Khorog.

The six challenges identified in this final report, and corresponding responses, inform a comprehensive and overlapping set of strategies for Khorog. They are city-wide, based on data collection and diagnostic assessment, developed in collaboration with stakeholders during participation activities. These strategies consist of several actions, both spatial (differentiated by Mahalla) and non-spatial, including community engagement measures, urban design guidelines, and legislative adjustments.

The recommendations outlined in this report provide a base for further discussion, investigation and studies. The varying detail (response chapters versus action table) and multi-dimensional nature of the recommendations (legislative, design, strategic) are intended to address challenges and potential impacts at a variety of scales (city-wide, neighbourhood and block). The presentation of the recommendations in this report is structured to provide a practical mechanism for stakeholder engagement.

The studies in Khorog, up to date, have provided environmental, legal, economic, spatial and infrastructural, governmental and managerial policy recommendations and projections, with outlined recommendations for transformative projects and planning and technical capacity-building for stakeholders. However, to guide the effective implementation of these recommendations, UN-Habitat suggests that a development of further actions with close participation from specific stakeholders, government officials, Rais of the Mahallas, and community members is undertaken. The strategy and action recommendations provided here can be extended further to form a mechanism with which to adjust existing and future town plans.

The objective of further studies should be to showcase the strategic recommendations with detailed designs for implementation on the ground. The diagnosis study and the city-wide recommendations in this report are expected to inform the development of transformative urban projects at the neighbourhood level, involving a wide range of stakeholders in the process. Details at the urban design level would demonstrate the implication of the strategies and actions recommended in this report. Furthermore, a guideline document for urban design projects in the city would drive the application of global sustainability and resilience principles at the level of detail required for implementation. In other words, the urban design proposals and guidelines can provide an opportunity to show how to transform the city into a more climate-friendly, pedestrian and cyclist-friendly, child-friendly city, as often expressed as a vision during the community engagement sessions.

Although detailed design proposals are essential to guide the shift towards a sustainable future, there is also a need to establish a functional implementation mechanism. As a starting point, an extensive study of own-source revenue analysis is needed to understand the municipal finance system and the inter-governmental, regional and local funding mechanisms. This analysis should be the first step to develop a capital investment planning proposal which would be derived from the strategic recommendations and actions developed in this report.

The Integrated Capital Investment Plan (ICIP) aims to link the municipality's strategic vision, budget and identified actions in this phase. It should explore the financial abilities of the municipality to manage the investment needs associated with the spatial development and implementation of the recommendations. With this plan, targeted investments should be prioritised, and a holistic approach should be developed for infrastructure investments in the city.

The above-mentioned implementation mechanism should not only link the actions to the financing system but also the legislative frameworks in Tajikistan and Khorog. Alongside urban design proposals, the current building codes should be revised to identify elements and reform options to include climate-resilient design. Such revision would allow the development of zoning guidelines aiming to showcase how the design proposal can be implemented and included in the current legal framework. This type of zoning guideline should respond to the area-based requirements to guide future development linked to the established vision.

In addition to the demonstrative design projects and guidelines, project prioritisation and financing and revision of the legal frameworks, local capacity on Global Development Agendas and Sustainable Development Goals should be strengthened to ensure the enabling environment for setting the municipality driven monitoring system after the project completion. All types of suggested further study should ensure close collaboration with the key planning actors, especially "Shahrofar" (planning authority in Tajikistan), to build local capacity. Strengthened capacity is essential to ensure the successful implementation and longevity of the project and have a countrywide impact and replicability through developed guidelines.

Fig 67. View on Ismaili Centre, May 2021

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Integrated Spatial Plan for Environmental and Socio-Economic Resilience

KHOROG
Tajikistan

Capacity Development Report

September 2021

UN-HABITAT
FOR A BETTER URBAN FUTURE

Aga Khan Agency for Habitat

Habitat Planning
A Programme of the Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience
Khorog, Tajikistan

Capacity Development Report

Aga Khan Agency for Habitat
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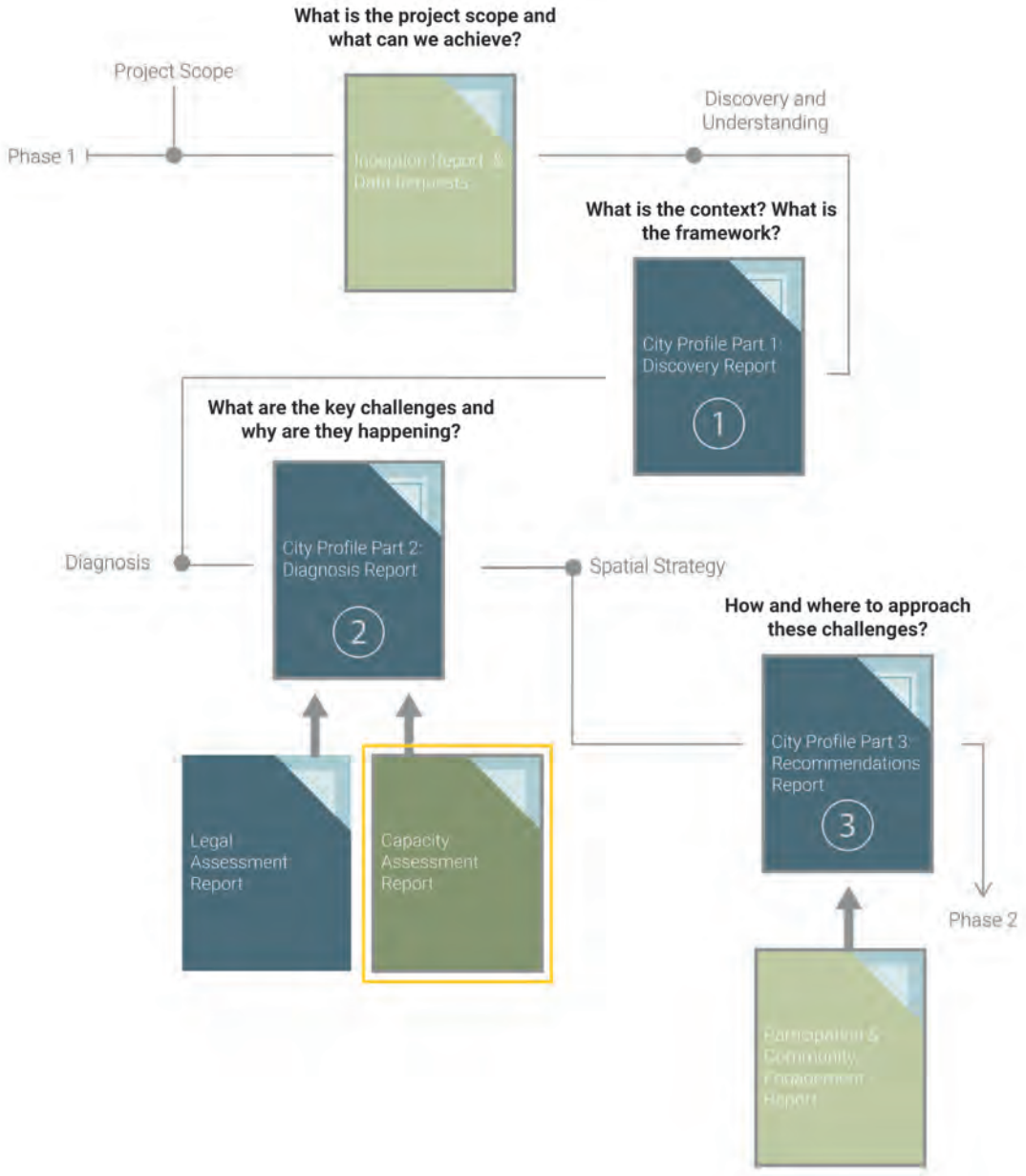
RESILIENT KHOROG 2035

Habitat Planning

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience

Capacity Development Report



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1

INTRODUCTION

1.1. MULTI-LEVEL INSTITUTIONAL COORDINATION

UN-Habitat has partnered with the Aga Khan Agency for Habitat and the government of Tajikistan, through the Aga Khan Development Network, for the 'Integrated Spatial Plan for Environmental and Socio-Economic Resilience' in Khorog Tajikistan. UN-Habitat's Urban Lab, in a collaborative process with other units and branches within the Planning Finance and Economy Section and the Urban Practices Branch, aims to provide planning direction that can improve resilience and social stability for existing communities and sustainably accommodate the growing population in Khorog through:

- developing strategies, masterplans, interventions, and regulations.
- knowledge creation, capacity building, and guidelines.

More specifically, the project aims to provide environmental, legal, economic, spatial and infrastructure policies and projections, governance and management frameworks, with recommendations for transformative projects, and technical capacity building for stakeholders in planning. UN-Habitat provides planning expertise to guide the growth of Khorog, drawing on existing methodologies, toolkits and best practices in a collaborative and integrated way.

This project is the result of an assessment of resiliency that was undertaken for Khorog in 2017 and 2018 by the Swiss State Secretariat for Economic Affairs (SECO), with partnerships from the international community for the Khorog Resilience Investment Program, that include the European Union for resilient infrastructure, the Government of Japan, the IFC and World Bank.

The work of UN-Habitat in collaboration with AKAH is part of The Khorog Resiliency Initiative, supported by SECO, to drive resilient infrastructure investment and provision of basic public services. The initiative will promote Khorog as a model example of a resilient city in the country and localize the national commitment to the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction, the Paris Agreement on Climate, and the Dushanbe Declaration for the International Decade on Water Action.

1.2. APPROACH & METHODOLOGY

1.2.1. Capacity Development Report in Content

Capacity Development is key to support the project's various phases and activities. As part of the project scope, UN-Habitat has undertaken an assessment of capacity gaps and delivered technical training to key stakeholders during the mission to Khorog that was undertaken as part of the Diagnosis phase. The findings from the Capacity Needs Assessment survey have been used to develop recommendations for the strategy and action plans phase. These recommendations are to be taken forward by key partners, including national, regional and local governments, AKAH, and international development agencies working in Khorog and Tajikistan.

1.2.2. Structure of the Report

The structure of this report is chronological; this introduction is followed by the Capacity Needs Assessment Survey (Chapter 2), which was used to inform the scope of training delivered to government officials in Khorog in May 2021 (Chapter 3). Finally, findings are based on the results of the survey and the training, as well as reflections on the process developed by UN-Habitat and thematic areas for future capacity development (Chapter 4).

1.2.3. Alignment with Project Tools

The Capacity Development Report builds on the project tools outlined in the City Profile report. Both the **City Resilience Profiling Tool (CRPT)** and the **City Resilience Action Planning (CityRAP)** Tool have been used to identify capacity gaps which have, in turn, been used to guide the training workshops and diagnosis of challenges. The training session that took place in the second mission to Tajikistan, also used the **UNDRR, "Ten Essentials for Making Cities Resilient"** and the **Disaster Resilience Scorecard for Cities** as guidelines.

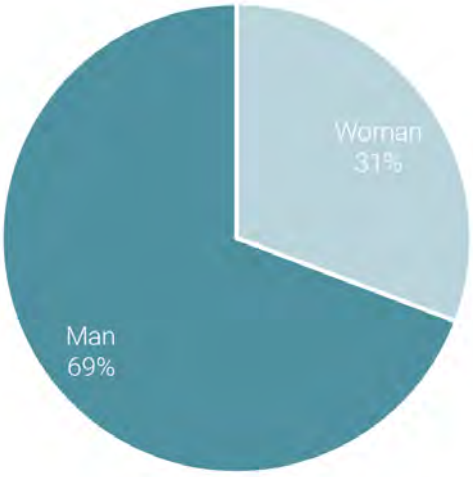

Fig 3. Gender breakdown of respondents

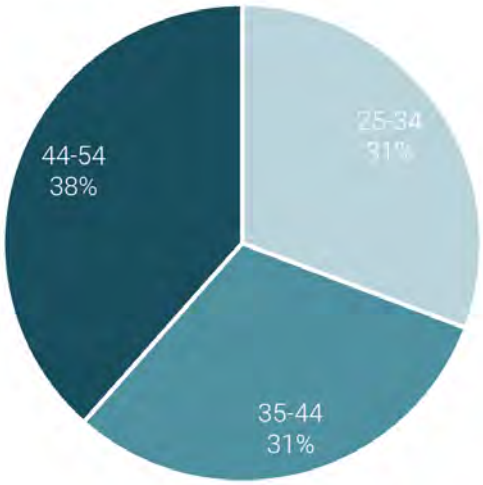

Fig 4. Age breakdown of respondents

Fig 5. View on the area in Tem, May 2021

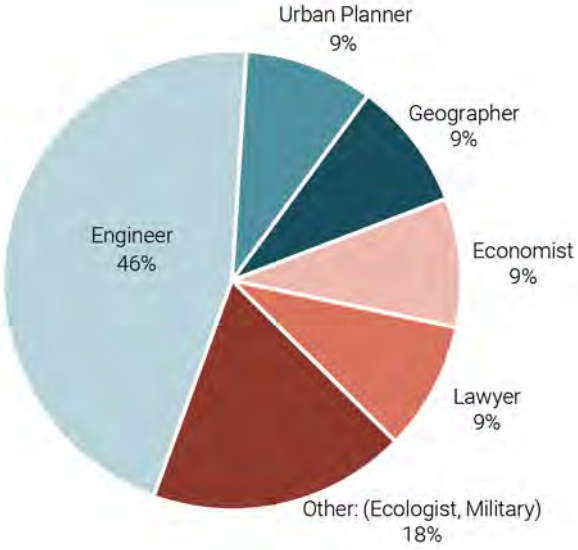

Fig 6. Profession of respondents

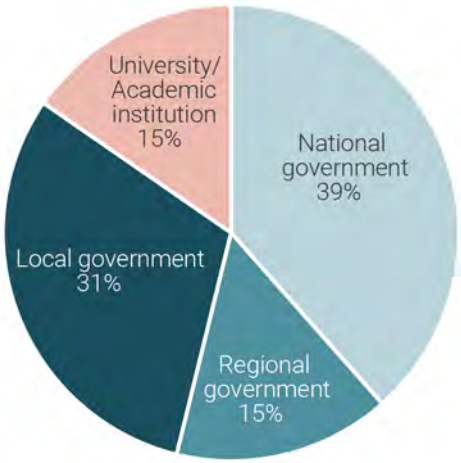

Fig 8. Affiliation of respondents

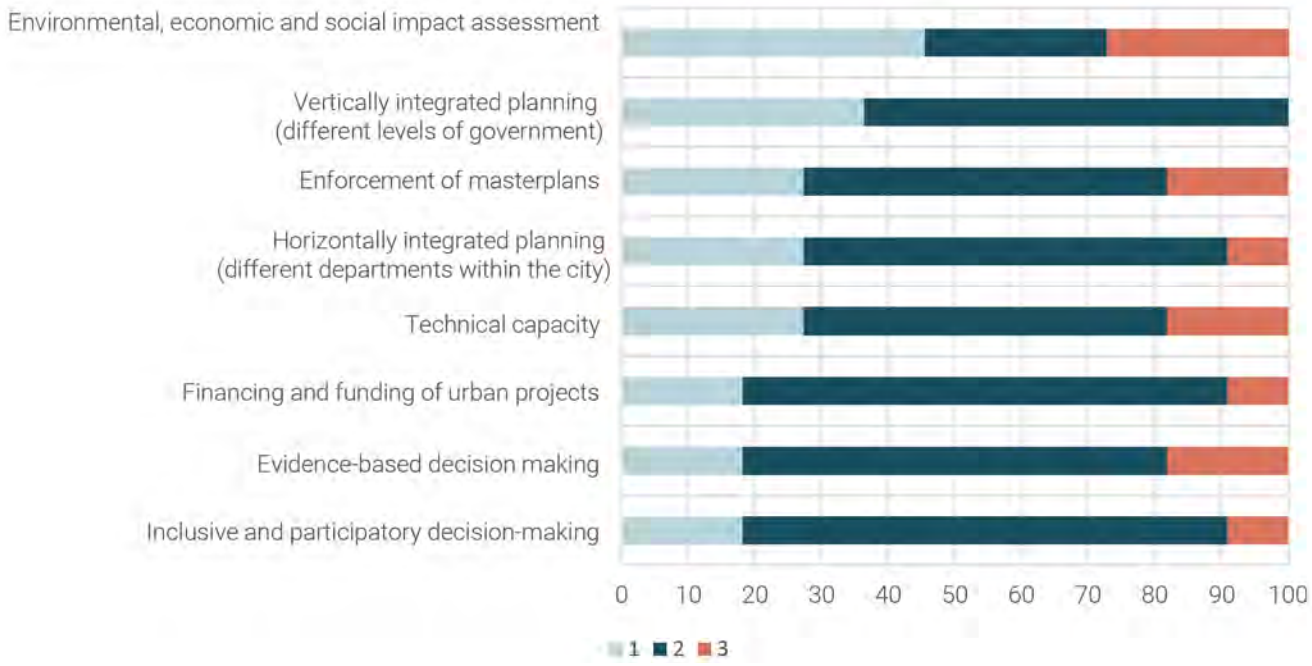

Fig 7. Limitations to sustainable development based on a rating between 1 and 3, whereby 1 is weak and limits sustainable urbanization, and 3 is strong and does not impact Khorog

2

CAPACITY NEEDS ASSESSMENT

2.1. OVERVIEW

In order to assess the current capacity of key stakeholders in Khorog and identify potential topics for address in the training to be conducted during the Diagnosis phase, UN-Habitat prepared a Capacity and Training Needs Assessment Survey. With support from AKAH, the survey was translated into Russian and shared with key experts and assigned focal points in the organizations directly involved in the project to ensure that results were accurate and relevant. The complete list of questions can be found in Annex 1.

2.2. RESPONSES

The structure of the survey followed the structure of the City Profile, in which aspects of resilience were split into four categories. It included an introductory section that allowed stakeholders to identify their gender, age, affiliation, profession and awareness of the Sustainable Development Goals (SDGs). The results have been disaggregated and a summary is provided below.

A total of 13 responses were received, 9 of which were completed by men and 4 by women. The participants were between the ages of 24 and 54. 39% of the respondents work for the national government, 15% for the regional government, 31% for the local government, and 15% in an academic institution (the remaining put 'other' as a response). The majority of the respondents were engineers (46%), while the remainder was composed of urban planners, geographers, economists, lawyers, ecologists and military personnel. 62% of the respondents identified themselves as well aware of the Sustainable Development Goals.

The majority of the respondents indicated poverty and job opportunities as the most critical urban challenges in Khorog. Other areas indicated were lack of affordable housing, vulnerability to natural disasters, and poor access to basic services. This response corresponds with the diagnosis presented in this report.

Stakeholders also indicated that limited environmental, economic and social impact assessments was a concern that limits Khorog's sustainable urbanization, followed by disjuncture in vertical and horizontal planning integration, and limited enforcement or implementation of masterplans.

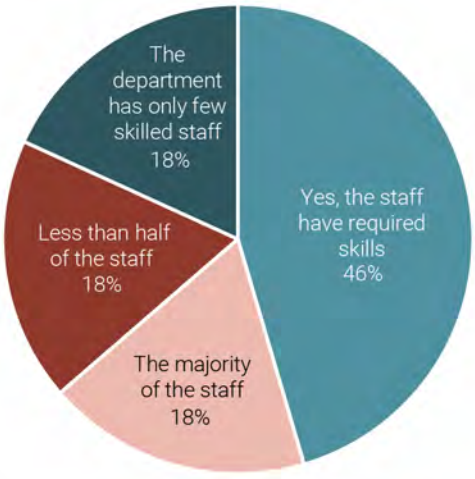

Fig 9. Skills required to carry out daily responsibilities

2.2.1. Capacity Assessment

The second section of the survey focused on a series of capacity questions in relation to legislative documents, budgets, maintenance and operation. This section was limited to those who were affiliated with the government (national, regional and local), and a total of 11 responses were submitted.

In questions related to skills and staff capacity required for daily responsibilities, 46% of the respondents stated that the staff in their department have the required skills. The remainder of the submissions were equally divided between those that attributed complete skill sets to the majority, less than half, or only few staff members.

When asked about kn owledge of key concepts, 81% of the respondents stated that they are familiar with urban planning and design or have the knowledge and practical experience. 46% believe that the staff in their department understand and have knowledge of issues related to climate change and/or disaster risk management. 63% of the respondents stated that the department undertakes some vulnerability and risk assessments that are used for city management and planning, but improvements are required.

Regarding financial resources, 53% of respondents believe that their department's budget allows for the carriage of only the most basic of tasks, and no respondent believes that the department's budget is sufficient or able to produce and retain contingency reserves. Results revealed the municipal budget sources as the national and regional government, as well as international aid, with very little funds raised locally through taxes and fees.

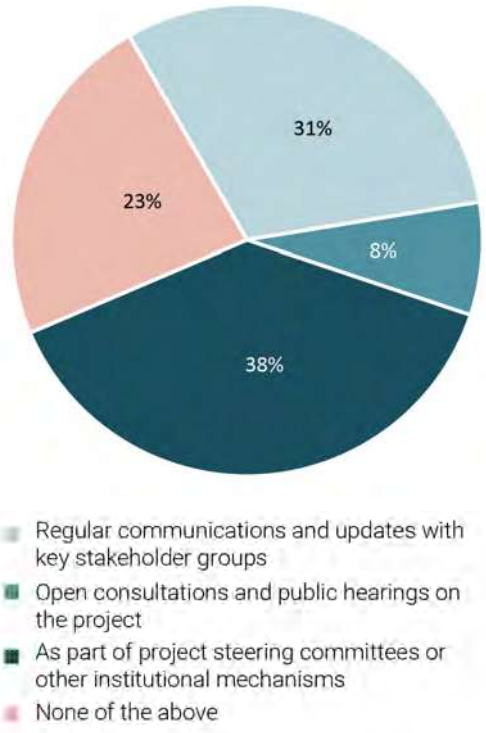

Fig 11. Engagement of stakeholders and use of participatory processes

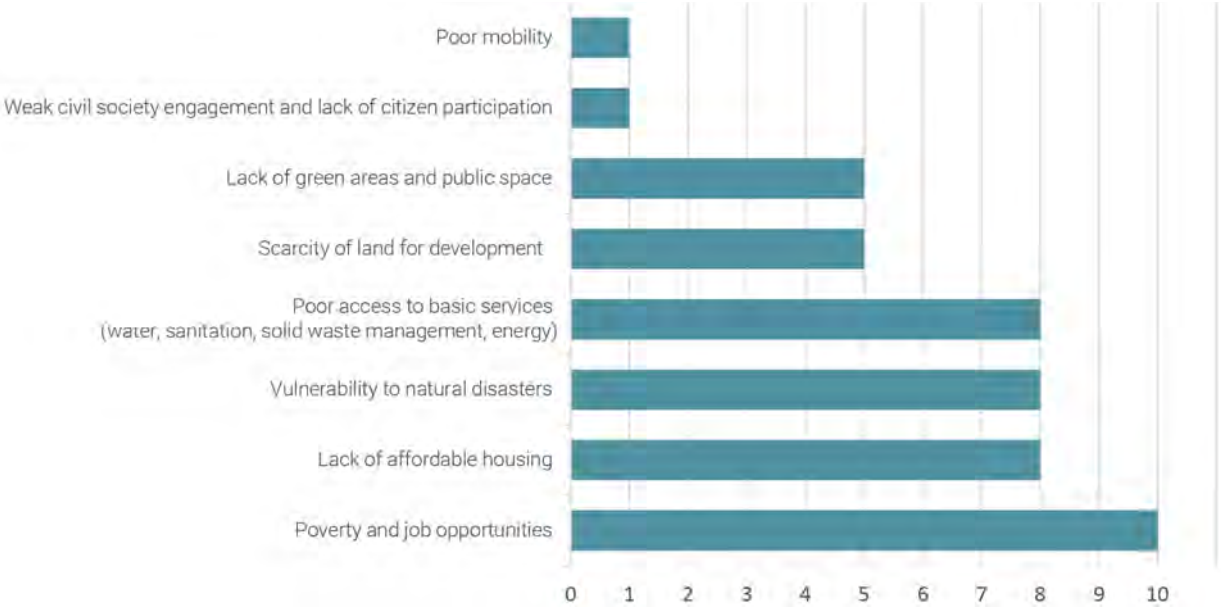

Fig 10. Challenges faced in Khorog

2.2.2. Institutional Resilience

The third section of the survey focused on the planning instruments and procedures currently utilized in Khorog, and challenges in governance and coordination.

According to the respondents, 69% believe that development in Khorog is undertaken in accordance with the General Plan, while 31% believe it is market driven. However, when asked whether implementation of the General Plan is well-executed, there were no responses to confirm that it is. Instead, 36% believe it is implemented in some Mahallas, 28% believe it is not implemented at all, and 36% are not sure.

In terms of planning instruments, 38% of the respondents stated that the city has planning instruments such as building codes, FAR, density guides and land-use regulations that are enforced, while 15% believe that the city has the instruments but does not enforce them. However, 47% believe that the city does not have any regulations. Planning instruments in Tajikistan are developed by the national government, though may not be enforced by local governments. Responses suggesting the lack of their existence could be due to lack of local awareness or a lack of enforcement.

The following challenges to project implementation were noted, in order from highest to lowest:

1) Alignment with legal or policy frameworks

2) Financing and funding

3) Long-term upkeep and maintenance

4) Governance and collaboration within city departments

5) Governance and collaboration with external stakeholders

6) Political will and long-term commitment

7) Strategy for enforcement, monitoring and follow-up

8) Technical feasibility

9) Training gap

10) Bureaucracy and digital technologies

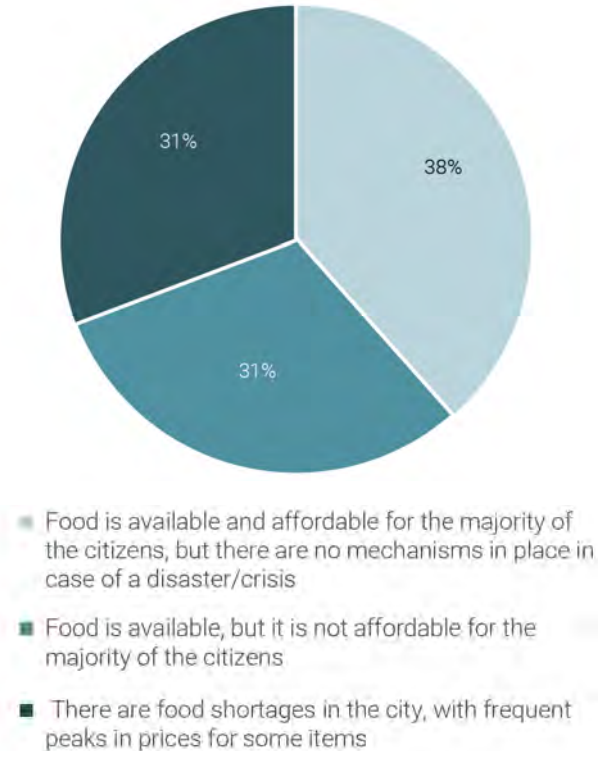

Fig 12. Access to food in Khorog

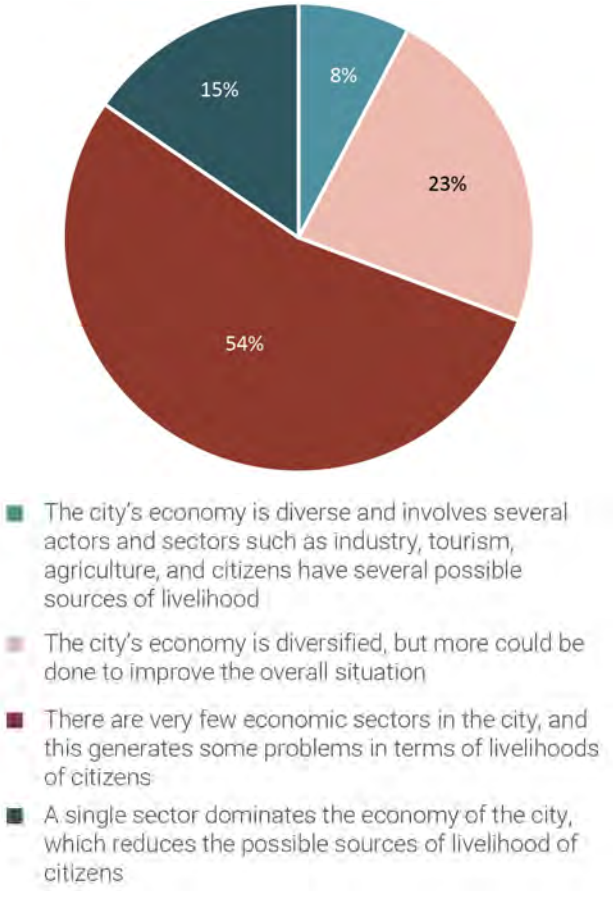

Fig 13. Diversity of the economy

2.2.3. Socioeconomic Resilience

The fourth section of the survey focused on socio-economic factors that could limit urban development. In particular, this looked at issues relating to housing, economy, access to food, crime and participation.

Regarding participation, there are various methods recorded to engage stakeholders (academia, civil society groups, women and youth, NGOs) in Khorog. These include regular communications and updates with key stakeholder groups, open consultations and public hearings, and the establishment of steering committees or similar institutional mechanisms. Only 23% of respondents believe that none of these methods are utilized.

The following are the key housing challenges identified in the survey that the city faces:

1) Lack of urban planning

2) Affordability

3) Vulnerability and risk exposure

All respondents believe that the housing in the city is somehow vulnerable to natural disasters, with 76% stating that vulnerability is moderate.

In the section relating to the economy, 53% believe that there are very few economic sectors in the city that generates livelihood problems for citizens. 23% believe that the city's economy is diverse but more could be done to improve the overall situation, and 15% believe that a single sector dominates the economy of the city, which reduces possible sources of livelihood. 9% felt that the economy was diverse.

Respondents stated that there are no strategies or initiatives in place to create further market activities and expand job opportunities. Responses on food access varied; 38% of the respondents stated that food is available and affordable for the majority of the citizens, but there are no mechanisms in place to ensure this in the event of a disaster/crisis. 31% stated that food is available, but is not affordable for the majority of the citizens, and 31% stated that there are food shortages in the city, with frequent peaks in prices for some items. This level of such responses suggests that access to food is a major issue in the city that will require urgent attention to address.

As for safety and security, 53% believe that people feel safe in the city at all times, 32% believe that there are isolated pockets of crime in the city and action is being taken to mitigate such risks, and 15% believe that several neighborhoods can be characterized as unsafe due to crime rates.

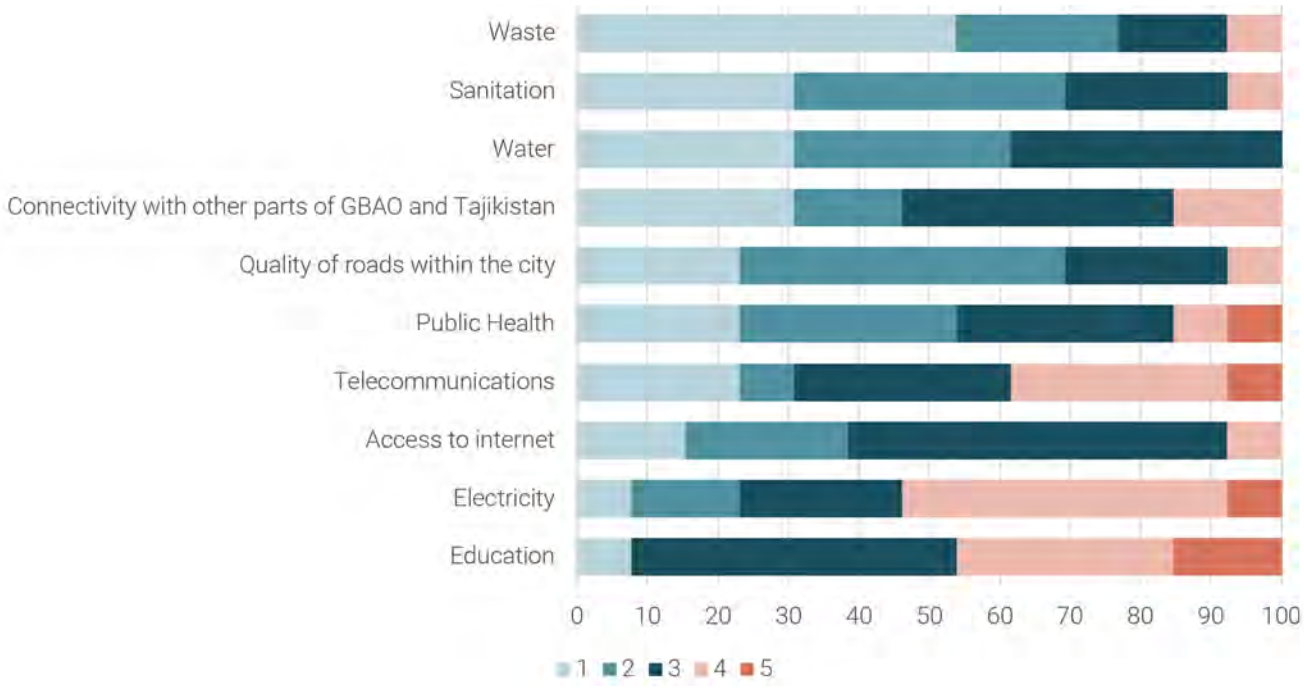

Fig 14. Use of social facilities as safe havens

2.2.4. Resilient Infrastructure and Basic Services

The fifth section of the survey focused on the provision of infrastructure and services in the city. This section aims to provide an assessment not only on basic services such as electricity, water, waste and sewerage, but also on roads and social services relating to education, culture and health, as well as access to digital services and telecommunications.

The first question posed requested the respondents to rate the services in Khorog based on their access and availability, whereby a rating of 1 is very poor and 5 is very good. The results revealed that basic services provision, in particular waste, sanitation and water are very poor. The quality of roads, both within the city and in terms of connectivity with the rest of GBAO and Tajikistan is also a critical issue. The provision of public health, telecommunications and access to internet is also facing challenges, while electricity and education pose the least challenges to provision. In a further question to elucidate the level of maintenance applied for basic services, 63% believe that there are mechanisms to maintain some basic services and infrastructure, but that these do not necessarily provide equal coverage for the whole city.

It is vital in establishing resilience through emergency response to natural disasters, to establish whether these facilities provide secondary uses, particularly in disaster events. Therefore, the survey posed a question about whether sports, cultural, health and education facilities are strategically used as evacuation centers in the event of a natural disaster. The results were mixed, with 31% stating that some of these facilities are used as evacuation centers. The rest of the responses were divided equally between those stating that a proportion are being used for secondary purposes, very few are being used, or that no secondary use strategy is in place at all.

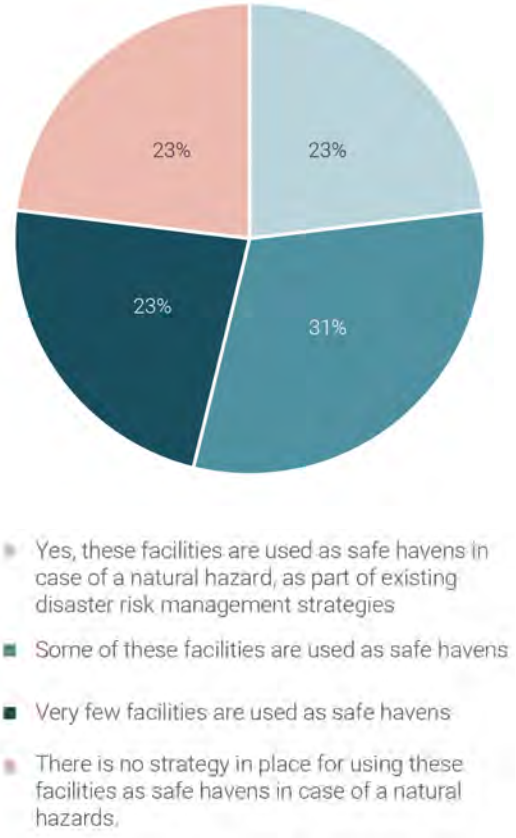

Fig 16. Use of social facilities as safe havens

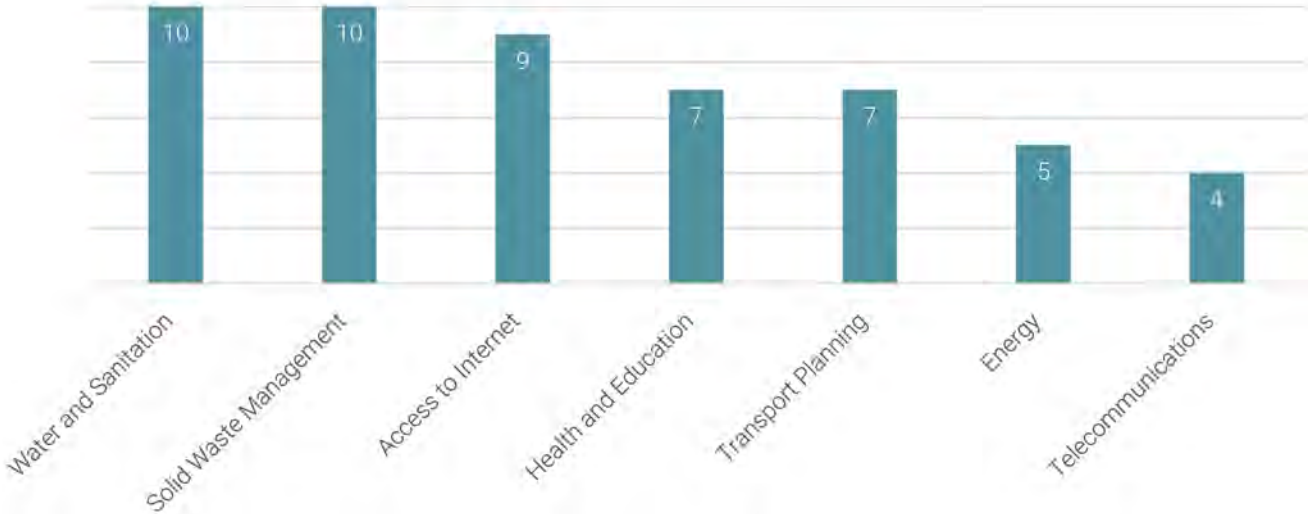

Fig 15. Priority areas for improvement

2.2.5. Spatial and Environmental Resilience

The final section of the survey considered spatial and environmental resilience in Khorog. This includes demarcation of sensitive areas, awareness, utilization of early warning systems and/or coordination mechanisms and re-establishment of basic services after disaster events.

Questions were asked to establish awareness of vulnerable areas and construction limitation to which 46% of the respondents stated that they believe a select few sensitive areas are considered as protected. 23% believe that all sensitive areas are considered as protected and equally, 23% believe that sensitive areas are not taken into account, or that urban plans of this nature do not exist.

To questions on natural disaster awareness, 38% responded that the majority of residents (50-70%) are aware of the risks they are exposed to, but the level of awareness could be improved. 31% responded by saying that 70-90% of the residents are aware, while 23% responded by saying that all residents are aware. This demonstrates that there is a high level of understanding by the majority of the residents, which could be due to the increased occurrence of natural hazards, affecting the majority of the population. The results could also be indicative that education or various campaigns and activities organized by the city and other development partners have been effective in increasing resident awareness. 53% of respondents stated that the city carries out some activities for increasing knowledge on the impacts of disaster/ climate change, but not on a regular basis.

As for coordination and early warning, 84% of the respondents stated that Khorog has an early warning system in place to inform on upcoming disasters but that this could be improved. This demonstrates that a large number of people are aware of the limitations in the current early warning system.

69% of the respondents believe that the city has first aid and response equipment, but that it is not sufficient. 69% also stated that the city has a coordination mechanism or center in place, but experience has shown that implementation in events of disaster could be improved, indicating an opportunity for improvement.

Results on the re-establishment of basic services in the aftermath of a disaster came back mixed. No one agreed with the statement that the departments are organized and capable to ensure a prompt re-establishment of basic services delivery following a disaster in all neighborhoods, highlighting a major issue in terms of coordination and disaster risk response. Instead, 46% believe that the departments are capable of re-establishing basic services only in a few neighborhoods, while 54% believe that re-establishment of basic services delivery in Khorog can take long periods of time after a disaster event.

The final question asked the respondents which aspects of disaster risk awareness and response require strengthening. All 4 provided options were selected by respondents, highlighting a major need in all 4 areas, which included hazard identification, Integration in urban plans and strategies, early warning, and decision support systems.

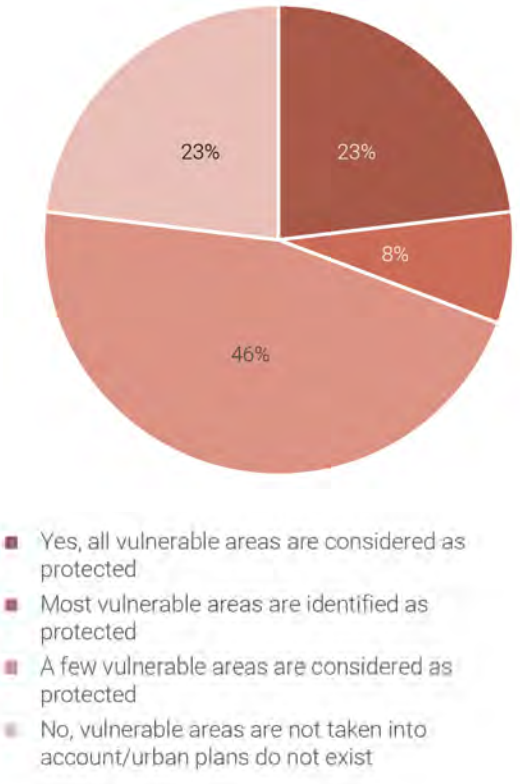

Fig 17. Protection of vulnerable areas

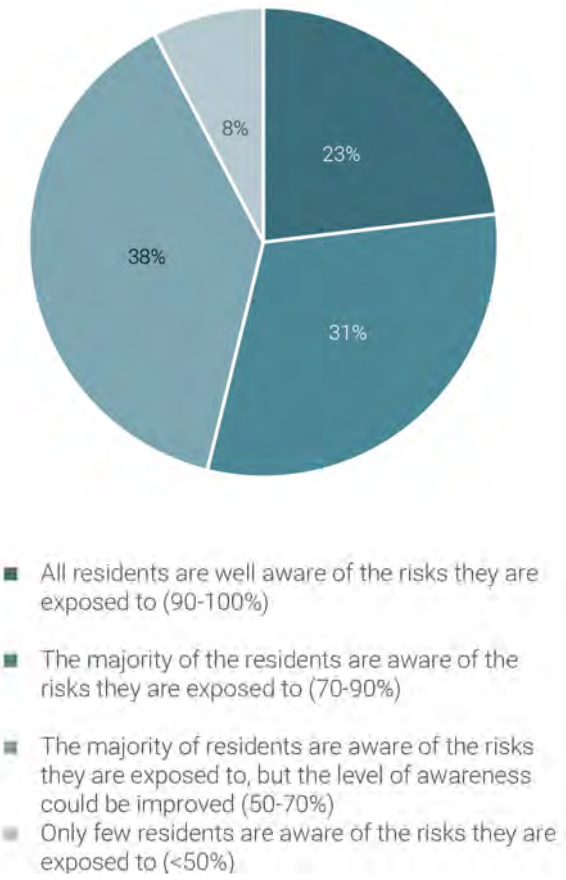

Fig 19. Awareness to natural disasters

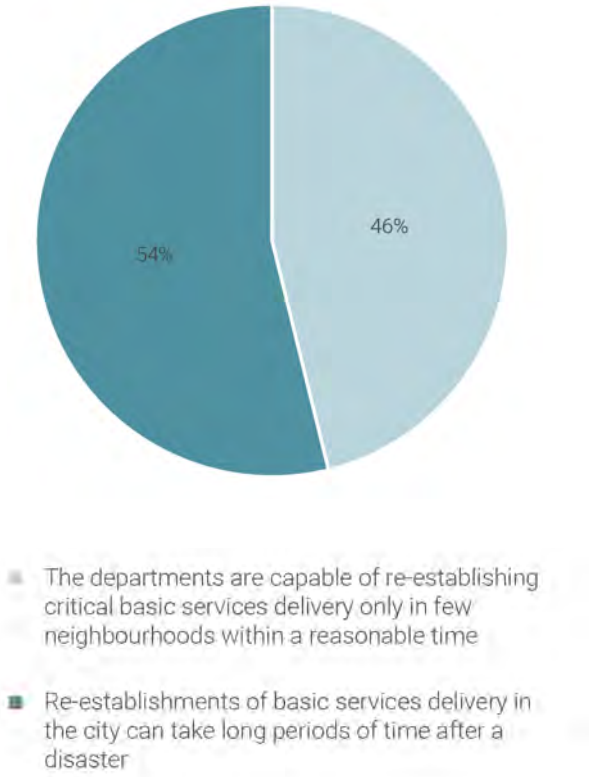

Fig 18. Re-establishment of basic services after a disaster

Fig 20. Aspects that should be improved in disaster risk management

No.	Participant Name	Position
1	Umed Tutishoev	Head of CoES Khorog
2	Gulmamadov Aydarmamad	Chief Architect of GBAO
3	Shaikhov Shaikh	Chief Architect of Khorog
4	Qodirzoda Fayzullo	Deputy mayor
5	Peruzoda Saidusuf	Head of Khorog Fire Department
6	Zarifkhonov Zarifkhon	Head of Vodokanal
7	Mamadnazarbekov Farod	Head of Khorog's office, Committee of Environmental Protection
8	Sufishoev Marodbek	Head of KMK
9	Afsona	Pamir Energy
10	Oraz Saidzokirov	AKAH (GIS)
11	Amiraidar Gulomaidarov	AKAH (Drone Operator)
12	Usuf Raimbekov	AKAH (Geologist)

Table. 1. List of participants

Time	Agenda item	Details	Time (mins)	Facilitator
10:00	Welcome	Welcome Note	15	AKAH
10:15	Global Frameworks	Global Frameworks for Sustainable Development	30	UN-Habitat: Pinar Caglin
10:45	Capacity Needs Assessment	Results of the Capacity Needs Assessment Survey	20	UN-Habitat: Ban Edilbi
11:05	City Profiling	Introduction to the City Profiling Tool	25	
11:30	Institutional Resilience	Law and Climate Change Toolkit	30	UN-Habitat: Gianluca Crispi (online)
12:00	**Lunch**		**60**	
1:00	Institutional Resilience	Application of the Law and Climate Change Toolkit in Tajikistan	30	UN-Habitat: Anna Kvashuk
1:30		Masterplan Assessment Tool and its Application in Khorog	45	UN-Habitat: Maia Smillie
2:00	Environmental Resilience	Environmental Resilience	30	UN-Habitat: Zafar Avzalshoev
2:30		Achieving Urban Resilience through Urban Design and Planning Principles	30	UN-Habitat: Anastasia Ignatova
2:45	Socio-Economic & Infrastructure Resilience	Infrastructure Planning and Financing	45	UN-Habitat: Herman Pienaar
3:30	Reflections	Questions and Reflections	10	

Table. 2. Agenda of training day

3

TECHNICAL TRAINING

3.1. OBJECTIVES

The objective of the technical training was to increase knowledge and awareness on various topics, with particular emphasis on resilience. It aimed to build a strong foundation of knowledge on the city's existing conditions, challenges and opportunities, to ensure a successful and long-lasting impact from the next stages of the project. The presentations delivered as part of the training have been shaped from the Capacity Needs Assessment and aim to address the specific challenges to the city highlighted by the respondents.

Expected outcomes:

- Increased learning about the definition of Resilience in this context
- Increased knowledge of the various tools developed by UN-Habitat
- Demonstrated understanding of how the tools and concepts developed can be applied in the context of Khorog.

3.2. LOGISTICS

The technical training was held in the Ismaili Centre, Khorog, on Friday the 21st of May, 2021. The majority of participants attended the event in person, while some joined the workshop online. The participants included government officials at the local, regional and national scale, representatives from Aga Khan agencies, private sector actors and key institutions. The training was facilitated by representatives from the Aga Khan Agency for Habitat and UN-Habitat Urban Planning and Design Lab.

The presentations were delivered mostly in person, with the exception of that on the Law and Climate Change Toolkit. Six of the presentations were delivered in English by the presenter and translated to Tajik with the support of an interpreter. Two presentations were delivered in Russian and one in Shughni, without the need for direct interpretation.

Fig 21. Anna Kvashuk presenting the application of the Law and Climate Change Toolkit in Tajikistan

3.3. SUMMARY OF TRAINING

3.3.1. Welcome note

The technical training commenced with a welcome note from Malika Giles (AKAH), who gave an overview of the Khorog Resilience Project, the collaboration with UN-Habitat, and the purpose of the technical training.

3.3.2. Presentations

Global Frameworks for Sustainable Development

Pinar Caglin (UN-Habitat) delivered a presentation on key global frameworks for sustainable development.

Key points:

- The role of urban areas in achieving all Sustainable Development Goals (SDGs)
- Transition from Millennium Development Goals (MDGs) to SDGs
- Overview of the 17 SDGs, their targets and indicators, with particular focus on SDG 11 and its links to other SDGs
- Monitoring and reporting on the SDG targets (Voluntary National Reports [VNR] and Voluntary Local Reports [VLR])
- Overview of the New Urban Agenda (NUA) and other complementary and interlinked agendas such as the Sendai Framework for Disaster Risk Reduction, the Paris Agreement and the Addis Ababa Action Agenda on Financing for Development

Capacity Needs Assessment Results

Ban Edilbi (UN-Habitat) delivered a presentation on the results of the Capacity Needs Assessment survey that was shared with the participants prior to the training session.

Key points:

- Challenges in Khorog include poverty and job opportunities, lack of affordable housing, vulnerability to natural disasters and poor access to basic services
- The presentation addressed limitations to sustainable development and identified training topics
- Housing challenges, economic opportunities, jobs and access to food
- An evaluation of availability and access to basic services
- Decision support systems, identification of hazards and risks, and integration of disaster risk management into urban planning are key areas that require strengthening.

Fig 22. Anastasia Ignatova presenting urban design best practices and examples to achieve urban resilience

Urban Profiling

Ban Edilbi (UN-Habitat) delivered a presentation on the City Profiling Tool that is used by UN-Habitat's Urban Lab in projects to guide planning efforts in cities toward a sustainable direction. The presentation provided an explanation of the process used, the inputs, and results of the tool. Various examples were used to demonstrate the use of the City Profiling Tool.

Key points:

- An explanation of the process with three key questions: Where are we today? Where do we want to be? How do we get there?
- A definition of the city profile and breakdown of the key components that feed into the city profile.
- The approaches utilized (integration of urban planning, urban economy and legislation, and the multi-scalar approach)
- Examples from Saudi Arabia were presented to demonstrate the use of the city profile in identifying issues and recommendations
- Demonstration projects were highlighted as a key opportunity to ground high-level strategic recommendations and action plans.

Law and Climate Change Toolkit

Gianluca Crispi (UN-Habitat) delivered a presentation on the general overview of Law and Climate Change Toolkit developed by UN-Habitat.

Key points:

- Institutions and Governance assessed as part of the toolkit (mechanisms of multi-level institutional coordination, participatory governance, data collection and sharing, and local government mandates)
- Planning instruments (classification of land with allowed uses, transportation and infrastructure networks, planning at scale and urban growth boundaries)
- Climate risks and vulnerability assessments including adaptation and mitigation options
- Economic and non-economic incentives

Application of the Law and Climate Change Toolkit in Tajikistan

Anna Kvashuk (UN-Habitat) delivered a presentation on the application of the Law and Climate Change Toolkit in Tajikistan. The presentation provided an overview on the process of applying the toolkit and the current stage of application.

Key points:

- The process of applying the Law and Climate Change Toolkit, conventionally divided into 9 stages for ease of use starting from legal resources mapping and finishing with the provisioning of a full list of recommendations
- Specification of the current state of the study and indication of next steps
- Description of meetings with experts and comparison on the fullness of the information received from them under the Law and Climate Change Toolkit
- Description of the difficulties encountered (lack of an open database with secondary legislation, technical documents, etc.).

Masterplan Assessment Tool

Maia Smillie (UN-Habitat) delivered a presentation to introduce the Masterplan Assessment Tool, a tool that was developed by UN-Habitat to review existing plans and assess ongoing planning processes. The tool was applied to the AKTC masterplan as a demonstration of its use.

Key points:

- Explanation of the purpose of the tool, why it is useful for Khorog, and the key components that constitute the tool
- The various sections, themes and indicators of the tool were presented
- Other applicable tools developed by UN-Habitat were also presented, including the Participatory Incremental Urban Planning Tool (PIUP) and the Legal Assessment Tool

Environmental Resilience

Zafar Avzalshoev (UN-Habitat) delivered a presentation on environmental resilience. The presentation provided an overview on the concept of resilience, UN-Habitat's definition, and various considerations and examples of how resilience could be embedded into various aspects of the city. UNDRR's 10 Essentials for Making Cities Resilient was used to structure the different considerations and examples, to further acquaint the participants with existing frameworks and how they could be applied in local context.

Key points:

- Definition of Urban Resilience and key concepts of resilience
- Overview of UNDRR's 10 Essentials for Making Cities Resilient
- Examples of various mitigation measures that could be used in Khorog and applied elsewhere
- Other applicable tools developed by UN-Habitat were also presented, including the City Resilience Profiling Tool (CRPT) and City Resilience Action Planning Tool (CityRAP)

Achieving Urban Resilience through Urban Design and Planning Principles

Anastasia Ignatova (UN-Habitat) delivered a presentation on the use of urban planning and design to achieve urban resilience. The presentation included an explanation of various urban planning concepts, such as UN-Habitat's 5 principles of sustainable neighborhood planning. The presentation also provided various examples of how resilience is embedded into urban design.

Key points:

- UN-Habitat 5 principles of Sustainable Neighborhood Planning, including the various forms of density
- Explanation of the "Sponge city" concept and the use of public spaces such as parks and pocket parks to increase resilience.
- Examples from China on sustainable housing design and reconstruction

Infrastructure Planning and Financing

Herman Pienaar (UN-Habitat) delivered a presentation on Capital Investment Planning as an instrument to identify needs for capital projects and coordination of financial and time-line improvement efforts for resilient and sustainable development outcomes. Examples in the application of the Capital Investment Planning were presented to demonstrate its use.

Key points:

- Definition of Capital Investment Planning and objectives
- Overview of common capital investment problems
- The purpose of infrastructure and the use of a spatially targeted approach to investment
- The need for prioritization, and the value of strategic spatial plans to direct investment and outcomes
- The importance of considering the cost of maintenance.
- Plan – Prioritize – Implement – Outcomes.

Fig 23. Maia Smillie presenting the Masterplan Assessment Tool

4

FINDINGS

4.1. APPROACH

4.1.1. Use of Global Tools and Frameworks

Throughout the project, UN-Habitat has utilized various tools to tailor the approach to the Tajik context and the needs of Khorog. Various global tools and frameworks were utilized, such as AKAH's Habitat Planning Framework, the Sustainable Development Goals (SDGs), New Urban Agenda (NUA), UNDRR's Making Cities Resilient framework, the Disaster Resilience Scorecard, and Ten Essentials for Making Cities Resilient, among many others. The localization of these frameworks and tools along with the use of best practices helped demonstrate how such tools can be used to frame sustainable urban development approaches based on local needs, whilst bridging knowledge gaps and simplifying the terminology.

4.1.2. Engagement with AKAH

UN-Habitat has also relied heavily on the exchange with AKAH to construct a fuller understanding of the context and validate the findings, prior to sharing them with stakeholders. Throughout the two missions to Tajikistan, UN-Habitat sought to present the approach, findings and results to the AKAH team before applying them to the workshops. During the first mission in April 2021, UN-Habitat had a half-day workshop with the AKAH team, in which they contributed to filling data gaps and responded to UN-Habitat's questions. Together, the two teams were able to identify priority areas, required infrastructure upgrades, and key responses that have not yet been considered in the city. Once this data was collected and organized by UN-Habitat, AKAH's team reviewed and validated it, before proceeding in the diagnosis and recommendations.

During the second mission in May 2021, UN-Habitat undertook a second half-day workshop with the AKAH team to present the diagnosis, issues and responses. This also helped to further validate our findings before presenting them to the city, to ensure that the recommendations were appropriate and grounded in the local context. This continuous exchange between the two teams ensured that all parties were aligned in their views, avoiding miscommunication and differing expectations.

4.1.3. Site visits

Throughout the missions to Khorog, UN-Habitat has sought to engage with stakeholders to ensure a fuller understanding of the city. Engagement with the community has been considered and is further explained in the Community Engagement Report. Engagement with local partners with a strong presence and impact on Khorog has also been useful throughout the project. This included meetings and site visits conducted to the University of Central Asia (UCA) campus and Pamir Energy. Through site visits to both establishments, UN-Habitat was able to establish a fuller understanding of how these two establishments have impacted urban growth in Khorog, through both their current and future plans.

During the visit to UCA, UN-Habitat was able to learn more about their mission, the different phases of construction, and the various facilities. UN-Habitat also met various faculty members and students, and presented the diagnosis developed for feedback. Throughout the site visit, it was observed that UCA has the potential to increase research conducted on Khorog in areas of economic development, natural disasters and disaster risk management, culture and the arts, among many others. It also has the impact of drawing in greater resources to support the growth of the city. It also encompasses the further opportunity to strengthen ties to the local community by directly employing residents and enabling campus access by local residents, as the site visit made it clear that the university facilities are not currently open to

general public use. Increased access is critical to the achievement of the university town vision for Khorog. As such, some strategies need to be developed to increase community interaction and leverage the available resources to strengthen the identity of Khorog.

UN-Habitat also visited Pamir Energy, where staff members presented ongoing and future projects, followed by a tour of the facility. The visit helped to strengthen understanding on focus areas, such as enhancing energy production and distribution in response to areas affected by natural hazards, as well as increasing resilience and capacity development in disaster risk reduction (DRR) and geographic information systems (GIS). Pamir Energy has incorporated various measures to ensure that the current infrastructure is resilient, for example bypassing avalanche zones, installing protection measures and constructing high foundations in river areas. One of the core challenges they face is seasonal effects on the water supply, as energy production rests almost exclusively in hydropower. During winter, energy demand increases but water temperatures drop to near freezing levels, making it difficult to generate energy. The information collected during the site visit and consultation with Pamir Energy was useful in shaping UN-Habitat's delineation of issues and recommendations.

4.1.4. Learning by doing

The approach utilized throughout the project has also emphasized the importance of 'learning by doing'. Stakeholders at national and local level1 have been engaged throughout the project, and were informed of the different steps and findings. These stakeholders included the city and regional architects, as well as technical experts from various utility companies. This collaborative approach ensured that stakeholders are continuously engaged in a way that lessons learned in the process can be applied in future work.

For example, throughout the first phase, various meetings were conducted with Shahrofar (National level architecture committee). These meetings and consultations ensured continuous engagement that exposed them to UN-Habitat's study and approach. This will not only build their capacity, but will also ensure replicability across other cities in Tajikistan.

It is envisaged that this approach will continue in the next phase as the project progresses into demonstration projects, wherein various urban design approaches are explored and further expanded. With this approach, it is envisioned that the tools utilized in Khorog can be applied in the future in other cities in Tajikistan and Central Asia.

1 For more information on detailed engagement activities and participatory workshops, please refer to the Community Engagement Report.

Fig 24. UN-Habitat's site visit to Pamir Energy

Fig 25. Pamir Energy's facilities in Khorog

4.2. AREAS FOR FUTURE CAPACITY DEVELOPMENT

Based on the results of the survey and UN-Habitat's stakeholder engagement throughout the project, key thematic areas have been identified for future capacity development:

1) Urban Resilience

Overall, capacity development would be required in the area of urban resilience, in order to generate fuller understanding of key components or concepts falling under the umbrella of urban resilience, and how these can be integrated into urban planning and management systems. The detailed components are described below.

2) Institutional Resilience

a. Municipal finance

Revenue collection and use of various financing tools to fund urban projects is key to ensure that projects can be sustainably financed.

b. Development of Capital Investment Plans

Development of Capital Investment Plans could support the city in developing a coordinated approach to the identification and prioritization of urban projects.

c. Coordination for efficient natural disaster response

It was evident in the survey responses that various government and non-governmental actors are essential for natural disaster response. Ensuring coordination across these various actors is critical to ensure efficiency and avoid duplication of services.

d. Effective land management for limiting urban growth

The survey and mission both emphasized the lack of land available in non-hazard areas. Land management will be required to ensure future urban growth is limited to minimal risk areas, in line with urban growth boundaries.

e. Decentralization of urban planning function

For the efficient and directional functioning of urban planning, it is necessary to decentralize this system with empowerment of local governments to contribute to the full scope of urban planning options.

f. Reinforcement of stakeholders' position

Actions taken by the authorities, first of all, should presuppose an orientation towards requests from the population. It is the stakeholders who are the unifying link through which the state can find support in solving certain problems. Strengthening their positions (e.g. including the need to consult with them) will bring the two closer.

g. Strengthening climate change management issues within national government with subsequent implementation at the local level

Climate change issues, which are rather fragmentarily addressed in the legislation, are not widely and consistently regulated among the authorities (first of all, the Committee for Environmental Protection and its local bodies). Thus, it is necessary to detail the processes of adaptation to, and mitigation of the consequences of climate change that fall within the powers of the authorities.

3) Socio-economic Resilience

a. Participatory tools

Participation and community engagement are essential for development of urban projects. Various tools could be presented to stakeholders that demonstrate innovative approaches to ensuring people's voices are heard, such as volunteerism, strong community representation, community-based incentives, among many others.

b. Diversifying the economy of the city

The city faces challenges in high unemployment rates and limited job opportunities. Identifying future economic opportunities in the city could support livelihoods and increase job opportunities.

c. Food supply and urban agriculture

Khorog's food supply is often placed at risk by weather conditions and natural disasters. Further analysis on the current food supply systems and opportunities for increasing agricultural production in the city should be explored.

4) Resilient Infrastructure and Basic Services

a. Urban mobility / promoting non-motorized transport

Increased car dependency in the city could promote urban sprawl and increase congestion in the narrow streets of Khorog. Identifying ways to promote non-motorized transport in the city and integrate it into the city's plans and policies is crucial for sustainable urban development.

b. Solid Waste Management Strategies

It was evident through the mission and the survey that solid waste management is lacking in the city. Developing solid waste management strategies and promoting recycling in the city are required for Khorog's sustainable growth.

c. Contingency planning, redundancy and re-establishment of basic services delivery after disasters

Ensuring better disaster responses for resumption of basic services within the city is essential for consistent basic services provision.

5) Spatial and Environmental Resilience

a. Data collection and management

Identifying feasible data collection and management strategies for the city could support the city in developing a database for evidence-based decision making. An open city portal is currently being developed by AKAH, as well as a municipal services platform.

b. Effective use of information systems for integrated urban planning

There is a need for the development of an integrated urban plan in Khorog. Identifying the use of data and technology to develop such plan is required.

c. Use of early warning systems

Based on the results of the survey, the city currently lacks early warning systems. Greater understanding of early warning systems, in how they can be installed and utilized in Khorog would support disaster risk response in the city.

d. Nature-based solutions and protection of natural resources

As presented in the training conducted by UN-Habitat, a training session on nature-based solutions is suggested, to explore the concept through the use of best practices. The session could also touch upon strategies to ensure the protection of natural resources.

Fig 26. Anna Kvashuk presenting the application of the Law and Climate Change Toolkit in Tajikistan

4.3. RECOMMENDATIONS

Throughout the various activities undertaken over the course of the project for the Integrated Spatial Plan for Environmental and Socio-Economic Resilience in Khorog, UN-Habitat has sought to grow its own understanding of the city's current capacity, to ensure that the outcomes are appropriate to the local context. The continuous engagement with national and local actors aimed to progressively and incrementally build the capacities of leaders to develop and implement sustainable urbanization strategies in Khorog. Through a learning-by-doing approach, UN-Habitat aims to transfer knowledge and ensure understanding of UN-Habitat methodology. The training provided by UN-Habitat in May 2021 provided an overview of these tools and approaches, in the hope of generating further interest in city officials that could lead into more detailed learning about the tools presented and in following the project progress.

As a result of the engagement with various actors throughout the project, a set of recommendations are proposed as next steps:

1) Improve skills of national and local actors.

As highlighted in section 4.2, the delivery of further capacity development could support in improving skills, changing attitudes in the long-term, and impact current urban planning approaches.

2) Contextualize all training tools.

It is recommended to ensure that diverse approaches are utilized during training sessions. Methods used for training should move from "traditional" models to a much more practical and problem- solving focused model of training.

3) Use demonstration projects for learning-by-doing.

The first phase of the project generated interest in various stakeholders. The process adopted within the first phase, including data collection, processing and continuous engagement with AKAH, adopted a learning-by-doing approach. Demonstration projects, which are planned for the next phase, could be used as a tool to apply the learning-by-doing approach described in section 4.1. By keeping actors engaged throughout the process, various concepts can be further detailed, providing a more progressive approach to capacity development than "traditional" training models.

4) Engage further with governmental actors.

It is recommended that further engagement with government officials at different levels is applied in the various project phases, to ensure the continuity of interest. This engagement should be continuous to ensure progressive learning as actors follow the progress of the project. It is worth emphasizing that continuous national government engagement is essential to ensure that the learnings from this project could be used to inform urban development in areas across Tajikistan as a whole. This engagement could take place in various forms, namely through regular meetings and consultations, and embedding experts to facilitate knowledge transfer.

5) Engage further with UCA.

UCA's location within Khorog and its technical capacity can be utilized for the city's growth. During the mission to Khorog and site visit to UCA, it was brought to UN-Habitat's attention that the location of UCA is central to a vision for Khorog to become a university town. However, this would require further actions to increase interaction between UCA and residents. For example, continuous partnership between the local government and UCA could result in research papers and recommendations in areas of economy, culture, natural disasters, and disaster risk management, among many others. UCA is also a resource for increasing awareness between residents on natural hazards, and building capacity of local government through trainings and workshops.

Fig 27. Private house with a garden in Khorog, May 2021

5

ANNEX

5.1. CAPACITY NEEDS ASSESSMENT SURVEY

UN-Habitat prepared a survey to identify areas for capacity development and training, and to provide recommendations. With the support of AKAH, the survey was translated into Russian and disseminated among key stakeholders. UN-Habitat used Microsoft Forms to develop the survey, which can be found here.

1) I am a:

a. Woman
b. Man

2) Which age group describes you?

a. Less than 25 years old
b. 25-34
c. 35-44
d. 45-54
e. 55-64
f. More than 65 years old

3) How familiar are you with the Sustainable Development Goals (SDGs):*

a. I know the goals and know how they are related to my work
b. I know the goals but do not know how to apply them to my work
c. I am familiar with them
d. I am not yet familiar

4) In your opinion, what is the most critical problem in Khorog?* (multiple answers allowed)

a. Lack of affordable housing
b. Poverty and job opportunities
c. Poor mobility
d. Vulnerability to natural disasters
e. Scarcity of land for development
f. Weak civil society engagement and lack of citizen participation
g. Poor access to basic services (water, sanitation, solid waste management, energy)
h. Lack of green areas and public space
i. Other (please specify)

5) I work for:*

a. National government
b. Regional government
c. Local government
d. Mahalla representative
e. Service Provider
f. University/Academic institution
g. Private sector
h. NGO
i. Other

6) I am an:* (for government representatives and service providers)

a. Architect
b. Engineer
c. Urban Planner
d. Geographer
e. Social Scientist
f. Economist
g. Administrator
h. Lawyer
i. Other

7) **Which areas limit Khorog's sustainable urbanization?*** Rating 1-3, 1 is weak and limits sustainable urbanization, and 3 is strong and does not impact Khorog (for government representatives and service providers)

Area	1	2	3
Technical capacity			
Environmental, economic and social impact assessment			
Horizontally integrated planning (different sectors and departments within the city)			
Vertically integrated planning (different levels of government)			
Inclusive and participatory decision-making			
Evidence-based decision making			
Enforcement of masterplans			
Financing and funding of urban projects			

8) **In my organization:*** (for government representatives and service providers)

a. I make the decisions
b. I execute the decisions
c. I facilitate the implementation of other's decisions
d. I follow instructions and implement decisions
e. I manage and monitor the decisions

9) **What topics would you like to learn more about during the training?*** (for government representatives and service providers)

a. Urban Planning
b. Development of policies
c. Urban Mobility
d. Urban Resilience
e. Public Space
f. Housing
g. Land readjustment
h. Infrastructure financing
i. Decision-making processes
j. Data collection and analysis
k. Global Agendas (Sustainable Development Goals, New Urban Agenda)

CAPACITY ASSESSMENT

This section is for government representatives and service providers

10) **Who makes the decisions that impact your work?*** (for government representatives and service providers)

a. I make the decisions
b. Director of my department
c. The decisions are made at regional Level
d. The decisions are made at national level

11) **Does your department have enough skilled staff to carry out its daily responsibilities?*** (for government representatives and service providers)

a. Yes, the staff have required skills to carry out daily responsibilities
b. The majority of the staff have the required skills
c. Less than half of the staff have the required skills
d. The department has only few skilled staff

12) **The implementation of the General plan is:*** (for government representatives and service providers)

a. Well-executed
b. Implemented in some Mahallas
c. Not implemented at all
d. I am not sure

13) **What is the source of the municipal budget?* Check all that apply** (for government representatives and service providers)

a. National government
b. Regional government
c. Locally sourced, through taxes and fees
d. International aid
e. Other

14) **Do you believe your department has sufficient financial resources to carry out its tasks?*** (for government representatives)

a. The department's budget is sufficient to carry out all tasks and caters for contingency reserves
b. The department's budget is sufficient to carry out almost all necessary tasks
c. The department's budget allows the department to carry out only the most basic tasks
d. The department's budget is very limited and it is not sufficient to carry out the most basic tasks

15) **Is there a maintenance plan for basic services and infrastructure in Khorog, such as for water, sanitation, education, health, roads, drainage, electricity?*** (for government representatives and service providers)

a. Yes, there are mechanisms for maintenance and functioning of most basic services/ infrastructure in all parts of the city

b. There are effective maintenance mechanisms for most basic services and infrastructure in place in the majority of the city
c. There are mechanisms to maintain some basic services and infrastructure but not necessarily covering the whole city
d. There are no mechanisms in place to maintain basic services and infrastructure in the city

16) What applies to you in terms of Urban Planning and Design?* (for government representatives)

a. I have knowledge and practical experience
b. I have knowledge only
c. I have practical experience only
d. I am familiar with it
e. I am not familiar with it

17) Does your department have access to up-to-date (spatial) data and information that can be used as evidence to support the development of the city?* (for government representatives and service providers)

Area	Yes	No
Updated cadastral data		
Road/rail network		
Zoning data		
Natural features		
Spatial population distribution		
Municipal services (water, energy, solid waste, sanitation)		
Environmentally sensitive areas		
Risk areas (flooding, landslides, earthquake, avalanche)		
Migration		

18) Does your department have staff with an understanding of issues related to climate change and/or disaster risk management?* (for government responses)

a. Yes, the staff understand and have knowledge of issues related to climate change and/or disaster risk management
b. Yes, the department has some staff
c. Yes, the department has at least one staff member
d. No, nobody in our department has this kind of understanding or knowledge

19) Does your department make use of vulnerability and risk assessments for city management and planning purposes?* (for government responses)

a. Yes, the department regularly undertakes vulnerability and risk assessments, which are systemically used for city management and planning
b. The department undertakes some vulnerability and risk assessments that are used for city management and planning, but improvements are required
c. The department has little access to vulnerability and risk assessments
d. The department has no access to vulnerability and risk assessments

INSTITUTIONAL RESILIENCE

20) Development in Khorog is undertaken in accordance with:*

a. General plan
b. Market driven
c. Other

21) The planning and management of development in Khorog:

a. The city has building codes, FAR, density guides and land-use regulations, and enforces them
b. The city has building codes, FAR, density guides, and land-use regulations, but does not enforce them
c. The city does not have any regulations

22) What areas do you perceive to pose the highest risk and challenges to project implementation? (rank from 1 to 10)

Area	Rank
Financing and funding	
Alignment with legal or policy frameworks	
Long-term upkeep and maintenance	
Governance and collaboration within city departments	
Governance and collaboration with external stakeholders	
Political will and long-term commitment	
Strategy for enforcement, monitoring and follow-up	
Technical feasibility	
Training gaps	
Bureaucratic issues and digital technologies	

SOCIO-ECONOMIC RESILIENCE

23) How are stakeholders (Academic, Civil society groups, women and youth, NGOs) typically engaged in your city projects?*

a. Regular communications and updates with key stakeholder groups
b. Open consultations and public hearings on the project
c. As part of project steering committees or other institutional mechanisms
d. All of the above
e. None of the above

24) What are the top 3 housing issues in Khorog?

a. Quantity: supply not meeting demand
b. Affordability
c. Traditional housing
d. Vulnerability and risk exposure
e. Lack of urban planning
f. Lack of access to basic services
g. Other (please specify)

25) If you consider the quality of existing housing in your city, how vulnerable is it to natural hazards such as floods, landslides, earthquakes?*

a. Not vulnerable, as housing is built to withstand natural hazards
b. Moderately vulnerable
c. Vulnerable
d. Very vulnerable

26) Does Khorog have a strategy to create job opportunities and market activities?*

a. Yes, there is a municipal strategy for creating job opportunities and market activities
b. Yes, there is such a strategy in place but it is not working well.
c. There are a few initiatives being promoted, but without significant results so far
d. No, there is no such strategy in place, nor initiatives of this kind.

27) How diversified is the economy of Khorog?*

a. The city's economy is diverse and involves several actors and sectors such as industry, tourism, agriculture, and citizens have several possible sources of livelihood
b. The city's economy is diversified, but more could be done to improve the overall situation
c. There are very few economic sectors in the city, and this generates some problems in terms of livelihoods of citizens
d. A single sector dominates the economy of the city, which reduces the possible sources of citizen livelihoods

28) How would you characterize access to food in Khorog?*

a. Food is available and affordable for all, and there are effective food storage/supply mechanisms in place in case of a disaster/crisis
b. Food is available and affordable for the majority of citizens, but there are no mechanisms in place for cases of a disaster/crisis
c. Food is available, but it is not affordable for the majority of citizens
d. There are food shortages in the city, with frequent peaks in prices for some items

29) Which statement best describes the situation of Khorog in relation to crime and safety?*

a. People feel safe in the city at all times
b. There are isolated pockets of crime in the city and action is being taken to mitigate such risks
c. Several neighborhoods can be characterized as unsafe due to crime rates
d. The city is generally unsafe and dangerous, and crime is high

RESILIENT INFRASTRUCTURE AND BASIC SERVICES

30) Rate the services below in terms of their access and availability in Khorog: (rating 1-5, 1 being very poor and 5 being very good)*

Services	1	2	3	4	5
Quality of roads within the city					
Connectivity with other parts of GBAO and Tajikistan					
Electricity					
Water					
Waste					
Sanitation					
Public Health					
Education					
Telecommunications					
Access to internet					

31) Are sports, cultural, health and educational facilities strategically used as safe havens in the case of a natural disaster?*

a. Yes, these facilities are used as safe havens in the case of a natural hazard, as part of existing disaster risk management strategies
b. Some of these facilities are used as safe havens
c. Very few facilities are used as safe havens

d. There is no strategy in place for using these facilities as safe havens in the case of natural hazards.

32) From the list below, which aspects should be strengthened?*

a. Transport Planning
b. Solid Waste Management
c. Energy
d. Water and Sanitation
e. Health and Education
f. Telecommunications
g. Access to internet

SPATIAL AND ENVIRONMENTAL RESILIENCE

33) Are sensitive areas (flood plains, landslide susceptible land, etc.) considered as protected with no construction allowed?*

a. Yes, all sensitive areas are considered as protected
b. Most sensitive areas are identified as protected
c. A few sensitive areas are considered as protected
d. No, sensitive areas are not taken into account/ urban plans do not exist

34) In your opinion, how aware are residents of Khorog of the natural hazards and risks they are exposed to?*

a. All residents are well aware of the risks they are exposed to (90-100%)
b. The majority of the residents are aware of the risks they are exposed to (70-90%)
c. The majority of residents are aware of the risks they are exposed to, but the level of awareness could be improved (50-70%)
d. Only few residents are aware of the risks they are exposed to (<50%)

35) Are there any campaigns and activities in Khorog to inform the citizenry about disasters and the impact of climate change?*

a. Yes, the city carries out regular awareness raising activities to inform about disasters and climate change impact
b. Yes, the city carries out some activities for increasing disaster/climate change impact, but not regularly
c. The city does not carry out activities for increasing disaster/climate change impact awareness

36) Does Khorog have early warning systems in place to inform on upcoming disasters?

a. Yes, and they effectively reduce disaster risk
b. Yes, but could be improved
c. No

37) Does the city have sufficient first aid and response equipment to respond to disasters?

a. Yes, the city has sufficient first aid and response equipment, coming from the city, military and civilians
b. Yes, the city has first aid and response equipment, but it is not sufficient
c. No, the city does not have first aid and response equipment

38) Does the city have a coordination mechanism or a center for all relevant institutions to respond to a disaster?

a. Yes, the city has a center for all departments and institutions to effectively respond to a disaster, with good contingency planning mechanisms
b. Yes, the city has a coordination mechanism or center, but experience shows that implementation in times of disaster could be improved
c. The city does not have a coordination mechanism or center for emergency response

39) How capable do you think Khorog is of re-establishing basic service delivery in the aftermath of a disaster?

a. The departments are organized and capable to ensure a prompt re-establishment of basic services delivery following a disaster in all neighborhoods
b. The departments are capable of re-establishing critical basic services delivery only in few neighborhoods within a reasonable time
c. Re-establishment of basic services delivery in the city can take long periods of time after a disaster

40) From the list below, which aspects should be strengthened?

a. Identification of hazards and risks that impact Khorog
b. Integration of disaster risk management into urban planning
c. Decision support systems
d. Early Warning and communication

41) Is there anything else you would like to add?

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Integrated Spatial Plan for Environmental and Socio-Economic Resilience

KHOROG
Tajikistan

Participation & Community Engagement Report

September 2021

UN HABITAT
FOR A BETTER URBAN FUTURE

Aga Khan Agency for Habitat

Habitat Planning
A Programme of the Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience
Khorog, Tajikistan

Participation & Community Engagement Report

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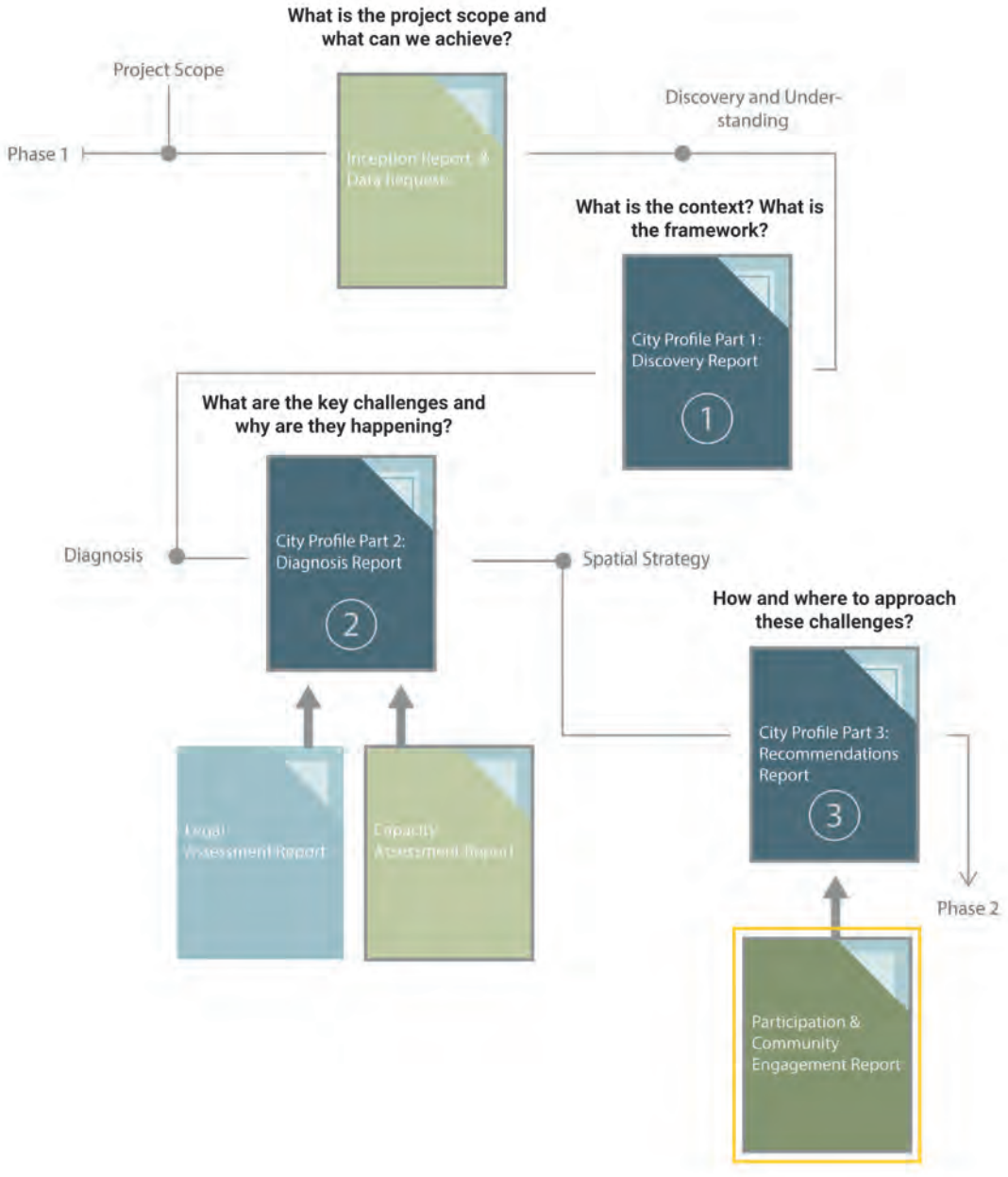
RESILIENT KHOROG 2035

Habitat Planning

Participation & Community Engagement Report



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1

INTRODUCTION

1.1. PROJECT BACKGROUND

This work forms a component of a collaborative project between UN-Habitat, the Aga Khan Agency for Habitat and the government of Tajikistan "Promoting Spatial, Environmental and Socio-Economic Resilience". The project has been formed within the framework of the Khorog Urban Resilience Programme (KURP), with funding from SECO, the Economic Cooperation and Development division of the Swiss State Secretariat for Economic Affairs. The KURP is a five-year initiative designed to establish the structures, systems, and capacity to transform Khorog into a model resilient city that promotes sustainable economic growth and investment.

The United Nations Human Settlements Programme (UN-Habitat) and Aga Khan Agency for Habitat (AKAH) signed a strategic Memorandum of Understanding (MoU), which will further enhance AKAH's planning activities in Tajikistan to improve quality of life. UN-Habitat has partnered with AKAH and other agencies of the Aga Khan Development Network (AKDN) in urban policy and capacity building to enhance the Global Network of Labs through collaborative work on planning and design projects, joint engagement in resource mobilisation, and joint development of normative planning and design products as a means to further inclusivity of human settlements in accordance with the Sustainable Development Goals (SDGs) and New Urban Agenda (NUA). The partnership will bring together UN-Habitat's global technical expertise and AKAH's experience in habitat planning, drawing on best practices in a collaborative and integrated way to guide the inclusive and resilient future growth of Khorog.

The project is designed to improve resilience for existing communities and ensure that the projected population growth in Khorog can be sustainably accommodated. More specifically, the project aims to provide environmental, legal, economic, spatial and infrastructural projections and policy recommendations, resilient infrastructural plans, guidance for the implementation of transformative projects, and capacity-building for stakeholders in planning and technical fields. The role of UN-Habitat's Urban Lab in the project is to provide planning expertise, drawing on existing methodologies, toolkits and best practices in a collaborative and integrated way.

The project is divided into two phases, as demonstrated in Table 1. During both phases the project has included participatory events such as technical working sessions, workshops and community engagement exercises.

During the project process the two major workshops were conducted: 1. "Understanding the city" and 2. "Diagnostic" workshop. Besides the two key events, the project team ran multiple working sessions as well as the mapping exercise with the local authority and technical experts which included mapping of key challenges within the city, important landmarks and other features.

1.2. PARTICIPATORY APROACH AND METHODOLOGY

Participation is an essential component of sustainable urban development, promoted by the 203 Agenda and the New Urban Agenda. Various techniques were proposed by the project team to define an inclusive participation strategy that engaged all stakeholders and the community in the planning process.

Resilience and safety are the core directives of the programme but social inclusion is recognised as

an important cross-cutting issue of urban planning and was built into the scope of the project with the implementation of the participatory strategy. Social inclusion encompasses human rights, gender equality, youth, children, older persons, persons with disabilities and persons of all races and religious beliefs. The project team established the guidelines to ensure participant diversity, including gender balance and representation of different age groups.

The UN-Habitat project team used a methodology based on the Participatory Incremental Urban Planning (PIUP) approach, which was developed by the Urban Lab as a step-by-step guide for urban planning in small to medium sized cities. The PIUP provides a flexible methodology that can be adapted to various contexts according to identified needs and focus areas.

The PIUP ensures that stakeholders are engaged in the planning process and outcomes in a meaningful way, safeguarding the ownership of completed projects and opening potential for ongoing, multi-stakeholder collaboration. Continuous engagement with communities and other stakeholders throughout the planning process was facilitated with workshops, design charettes, expert group meetings and updates at each of the various planning stages.

UN-Habitat also referred to the Habitat Planning Framework developed by AKAH, the mission of which is to establish "a safe and sustainable habitat in which communities, families and individuals can thrive". This framework contributes to a holistic planning approach, ensuring alignment with common strategic priorities. The framework consists of three phases and nine steps (each phase includes 3 steps). This structure includes guidelines on community-centred participatory design, government engagement, socio-economic and land use analysis based on a strong GIS component, for the purposes of planning, design, construction, and monitoring and evaluation. To apply the framework, UN-Habitat utilised the database established by AKAH's planning team, and incorporated this data with field-based discoveries.

The structure of this report is chronological; a brief summary of the introductory working session with key stakeholders, such as Committee of Architecture, Shahrofar Project Design Institute and University of Central Asia (UCA) is outlined, followed by the process and outcomes of the 1st stakeholder workshop "understanding the City". Next, a summary of the working session with the Swiss State Secretariat for Economic Affairs (SECO) experts and an outline of the meetings conducted during the first mission to Tajikistan. After the field mission and description of the "learning by doing process", the report provides a detailed summary of the workshop, "City Diagnostics and Recommendations", which is followed by a description of community engagement activities and the steering committee meeting. Finally, the report is concluded by the summary of working sessions with AKAH and SECO aimed to validate the final proposals.

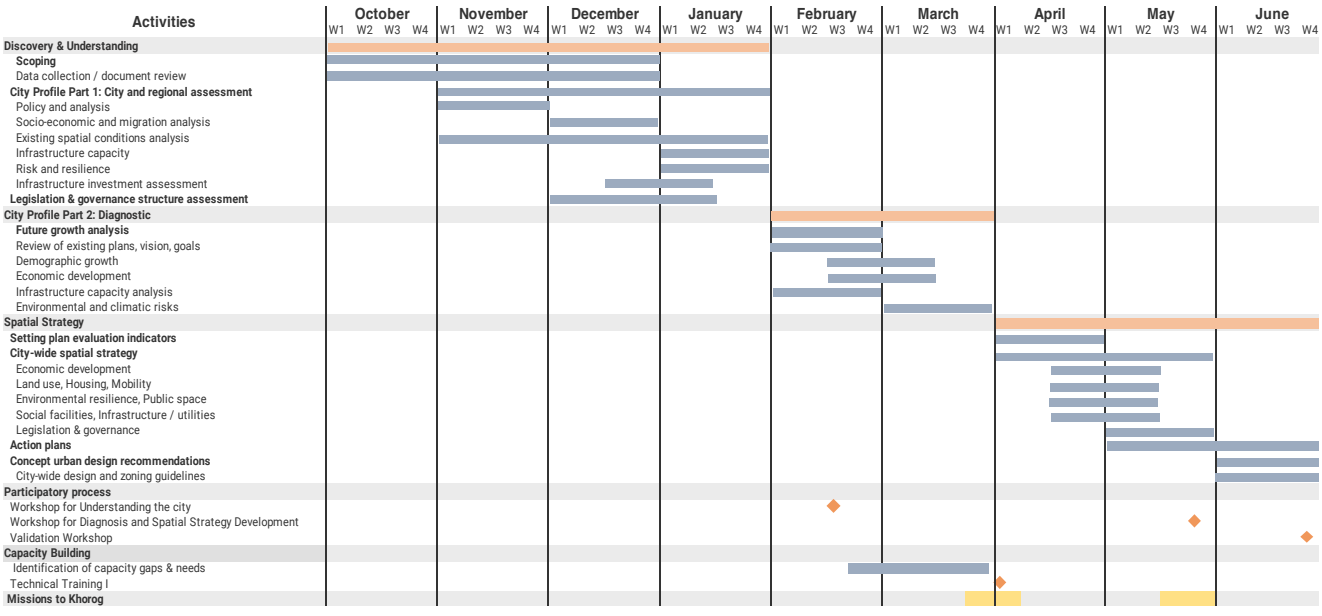

Fig 2. Positioning of the major participatory events within the project framework

PHASE 1	**Scoping, Analysis, Diagnosis and Spatial Strategy**			**Deliverables**
	Project Scope and Inception Report	What is project scope and what can we achieve?	This involves a review of existing reports and studies to understand the city, through desktop research. This formalised the project scope and next steps and identified gaps in the information available - requests for specific and updated data sets (GIS and other) were made and key stakeholders were identified for interviews.	• Inception Report • Data request
	Discovery and Understanding	What is the context? What is the framework?	Stakeholders were involved at this early stage, through discovery interviews. As resilience was the focus of the project, findings were directed by and filtered through four key areas; Environmental, Socio-Economic, Infrastructure and Basic Services, and Institutional Resilience. This first step informed the team of the challenges the city faced and directed the next stage of assessments.	• Discovery Workshop • City Profile Part 1: Discovery Report
	Diagnostic and Community Engagement	What are the key challenges and why are they happening?	This stage of work involved a data collection process, a data cleaning and series of assessments, based on the spatial resilience themes; environmental, socio-economic and infrastructure and basic services. The final theme, institutional resilience, was assessed by the urban legislation team and is included as an individual chapter alongside the data assessments. This step helped the team with a basis of understanding from which to identify focused community engagement activities, and on-site validation exercises.	• Diagnosis Workshop • City Profile Part 2: Diagnosis Report
	Spatial Strategy	How and where to approach these challenges?	This stage of work involved consolidating the challenges the city faced and identifying key spatial and non-spatial strategies by which to approach them. Not only can these set of plans and strategies support sustainable development in the city, but an understanding of the process can also be an opportunity for local government and stakeholders to take forward an evidence-based, participatory and collaborative approach to planning.	• Validation Workshop • City Profile Part 3: Recommendations Report
PHASE 2	**Transformative Projects, Implementation Tools**			
	Transformative Projects	How to actualise the plan?	This stage in the project involves identifying key pilot project sites, to showcase practical plan implementation, how the SDGs can be localised, and how an integrated approach to development can be actualised.	
	Capital Investment Plan	How aNd when to implement?	This tool provides a prioritisation of action plans and a finance and investment strategy to support plan implementation.	

Table 1. Project phasing and participatory events conducted

Fig 3. A trail in Andarsitez, May 2021

2

INTRODUCTORY WORKING SESSION STAKEHOLDERS

On the 18th of December after the project launch, the project team conducted the first working session with key stakeholders including AKAH, representatives from the Committee of Architecture, the Shahrofar Project Design Institute and UCA. The major objectives were to raise awareness on the future activities and understand the key agency mandates. The discussion was focused on local regulatory mechanisms and potential gaps.

The session involved a presentation made by AKAH and partners, and a discussion on the status of the 'General Plan' (2010). AKAH's technical team made a presentation on urban resilience and best practices in other contexts. During the session participants debated on the existing urban legislation and the meaning of the "Masterplan". As it was pointed out, there is no common understanding of the term "Masterplan" and its relation to the "General Plan". Afterwards, a representative from UCA presented about the development of a resilience plan in Naryn, Kyrgyzstan, a case study which can provide a better understanding of the context of medium size cities in Central Asia and key challenges they face.

Key discussion points:

- The city of Khorog has a General Plan, the main document which should guide the development in the city. The Plan was approved in 2010.
- The General Plan requires updating to respond to current needs. In the process of Plan actualisation, all the stakeholders, including UN-Habitat, should collaborate.
- The Masterplan developed by AKAH was not approved and, therefore, does not have any legal status
- Shahrofar is the only agency with the licence and authority to develop General Plans
- According to representatives from Shahrofar, a Masterplan should be developed prior to the General Plan and be focused on economy and ecology.
- UCA presentation on Naryn – a city in Kyrgyzstan which is similar in context to Khorog, also benefitting from an academic/knowledge hub.

After the discussion, the session participants were encouraged to attend the 1st workshop "Understanding the City", to discuss the General Plan and other related issues with stakeholders to ensure a common understanding of the status of the plan and city's critical challenges and opportunities.

Fig 4. Area in Nivodak, May 2021

3

STAKEHOLDER WORKSHOP "UNDERSTANDING THE CITY"

At the outset of the project, before the workshop was conducted the project teams from AKAH and UN-Habitat consulted several authorities, including the GBAO Governor and Mayor, the Committee for Architecture and Construction, the Head of Architecture for the UCA development, and Pamir Energy. After the preliminary study, which included stakeholder consultations on the existing conditions of the city, the discovery workshop took place on the 16th February 2021 as a part of the "Discovery and Understanding" project phase. The workshop was designed to present initial findings to government and civil society representatives, receive feedback from local experts, and stimulate a collective discussion amongst participant authorities and experts. The discovery workshop was the first participatory event of the project to establish the collaborative working process and mutual understanding on the project's outcomes.

3.1. WORKSHOP OBJECTIVES

The objective of the discovery workshop was to inform the stakeholders about the project activities and to build consensus on the project intentions, process, goals and outcomes, with particular emphasis on resilience. It aimed to gather feedback and to build a foundation of knowledge on the city's existing conditions, challenges and opportunities, to ensure a more successful and long-lasting impact from the next stages. It was also designed to highlight diversity or alignment of key stakeholder perspectives.

Expected Outcomes:

- Increased understanding of the definition of Resilience in the context of Khorog;
- Increased awareness about project expectations, definitions and outputs;
- Gaps identified in UN-Habitat and AKAH understanding of Khorog;
- Gaps Identified in analysis and data;
- A unified understanding of city challenges;
- A unified understanding of city opportunities;
- Challenges in governance and capacity identified.

3.2. WORKSHOP LOGISTICS

The workshop was held in the Ismaili Centre, Dushanbe, on the 16th of February 2021. The majority of participants attended the event in person, while some joined the workshop online (due to travel restrictions caused by the COVID-19 pandemic). Participants included government officials at the local, regional and national scale, representatives from the Aga Khan agencies, the private sector and key institutions. The workshop was facilitated by the representatives from the Aga Khan Agency for Habitat and the UN-Habitat Urban Planning and Design Lab.

3.3. PARTICIPANTS

Government	Umejon Nosirzoda	First Deputy Chairman of GBAO
	Alisher Mirzonabotov	Mayor of Khorog
	Alisher Goibnazarov	Chief Architect of the city of Khorog
	Eraj Zoirov	Head of the City Planning Department
	Abdurahmon Karimzoda	Deputy Chairman of the Committee for Architecture and Construction
	Ruslan Sodykov	Representative for the national program (ШГСЭВ)
	Umed Tutishoev	Head of CoES
Shakhrofar	Gulbahor Davlyatova	Head of the Urban Development Department
	Dina Ismakova	Chief Specialist for Urban Planning
Civil Society	Nabot Dodkhudoeva	Head of the public organization "Madina"
AKF	Zoir Navjuvonov	Head of Partnership
AKDN	Ruslan Bobov	Head of Administration
AKAH	Najib Yaminov	Head of EM department
	Pasor Dilbovarov	Government Relations Advisor
	Tokhir Sabzaliev	Head of the Operational Research and Technical Department
	Malika Giles	Program Manager
	Rukhshona Makhsudinova	Urban Planner (KURP)
UN-Habitat	Herman Pienaar	Head of the Urban Planning and Design Lab
	Pinar Caglin	Project Lead
	Maia Smillie	Urban Planning and Design expert
	Ban Edilbi	Urban Resilience expert
	Mario Tavera	Planning and GIS expert
	Anna Kvashuk	Urban Legislation and Governance expert
	Zafar Avzalshoev	Local Urban Infrastructure and Planning expert
	Anastasia Ignatova	Urban Planning and Design expert

Table 2. Workshop participants. The workshop was facilitated by: Malika Giles, Rukhshona Makhsudinova, Anastasia Ignatova, Zafar Avzalshoev, Anna Kvashuk

3.4. WORKSHOP SUMMARY

The workshop consisted of three major components:

1) Introduction and ice-breaker exercise,
2) Presentation by UN-Habitat,
3) Group discussion.

During the ice-breaking exercise, the participants identified elements or practices of urban planning and design that generate opportunities and challenges for the city. The exercise was designed to generate a comparative discussion and allow stakeholders' own perspectives to emerge. The most common positive comment was "alignment with the General Plan".

The presentation by UN-Habitat was divided into the 3 thematic areas:

- Institutional resilience;
- Socio-economic and infrastructure resilience;
- Environmental resilience

A 15-minute group discussion was held after the presentation on each thematic area in which major gaps, challenges and opportunities were identified. The majority of comments on "Socio-economic and infrastructural resilience" and "Environmental resilience" were related to data gaps. Participants provided their feedback on major initiatives happening in Khorog and critical challenges in the city. Stakeholders expressed their will to collaborate with the team and support further revision to establish

a shared vision with civil society. The critical role of the citizens in decision-making was emphasised throughout. The local government was identified as a key stakeholder that should play a vital role in the planning process and development of strategic recommendations.

During the workshop, participants were asked to fill out a questionnaire that included a table of "challenges and opportunities" for each thematic area. The completed forms were analysed and retained for further analytical use.

3.5. PRESENTATION: ICEBREAKER EXERCISE

In the icebreaker exercise, the participants were asked to choose two pictures from a series of photographs provided. One of these photographs should be chosen for its reflection of an element or elements that might constitute a "good city" and one should be chosen for its reflection of elements that constitute a "bad city" in the participant's own opinion. After the selection, each participant was asked to explain her/his choice.

The opinions were collected and compared to establish averages that established a unified vision of major spatial development opportunities and challenges for cities.

Other discussion points:

- In Khorog there are six bridges. The bridge in Barkhorog needs a major overhaul. This year a new bridge will be constructed, which will solve many issues in the city. Further solutions such as this will change the city significantly;
- Green alleys can be constructed along both sides of the river, creating an appealing public space for leisure and promenade.

Fig 5. Participants during the Icebreker Exercice

Fig 6. Mayor of Khorog during the Icebreker Exercice

Good city	Bad city
Historic city. The city with history is a "warm/welcoming" city	Highway
High density	Extremely high density
Ecosystem, trees, vegetation	Environment not suitable for People with Disabilities
Leisure and public space	Ecological degradation
Developed riverfront, integrated water resources into the urban fabric	Non cycling-friendly city, unregulated mobility patterns
Interesting urban design elements	Discrepancy with security regulations
Pedestrian friendly environment	Very close proximity to water resources, risks of flooding
Low-rise development, human size buildings	Abandoned and destroyed infrastructure
Well-developed building fronts and appealing design	Low quality of construction
Modern architecture,	Discrepancy with the General Plan
Alignment with the General Plan	Natural disasters
Infrastructure, bridges	Bad waste management
Green alley	Geological situation was not taken into account while planning
Classic local materials, durable structures	

Table 3. Description from participants on a "good city" and "bad city" (abridged to keywords and sentences)

3.6. THEMATIC AREA I: INSTITUTIONAL RESILIENCE

Presenter: Anna Kvashuk

Key presentation points:

- Analysis of legislative acts and actors in land management, urban development, climate change;
- Hierarchical structure of urban planning documentation in Tajikistan and its regions;
- Drawing up a management scheme in Tajikistan for the regulation of land management issues, urban development challenges, climate change;
- Development of a 7-step model for General Plan development in the territories of Tajikistan;
- Analysis of land types and forms of land tenure outlined in the Land Code of Tajikistan;
- Defining the meaning and application of Environmental Impact Assessment (EIA) in the development of the General Plan.

Reactions to the Presentation:

The first comment on the presentation was offered by the Mayor of Khorog, Alisher Mirzonabotov, stating that currently, the General Plan for Khorog has not been approved and is in the process of development. In response to the Mayor's comment, Dina Ismakova, Chief Specialist for Urban Planning from Shahrofar, stated that the General Plan for Khorog was approved in April 2010.

Dina Ismakova stated that the plan was designed according to the norms and regulations of resilient planning. She reiterated that there remains a considerable lack of technical capacity not only in the city of Khorog but all over Tajikistan. Particularly, the Khukumats lack of highly qualified architects. In addition, very often, architects do not follow the General Plan. It was stated that the General Plan needs actualisation to ensure its alignment with current socio-economic and spatial demands.

Gulbahor Davlyatova, the Head of the Urban Development Department of Shahrofar, stated that an up-to-date topographic survey is needed to proceed with actualisation the General Plan. The survey has not yet been conducted. The Mayor of Khorog commented that the financial resources (850, 000 USD) for the survey and actualisation of the General Plan had been allocated.

Dina Ismakova commented that the development of Tem was a headliner project, created in 2014. The project area of 180ha included the territory of the floodplain and was designed to accommodate 15,000 residents. The area could function as an additional neighbourhood of Khorog. Construction of the drainage system and dams were considered in the project. The project's informal name was "Khorog city". Resources were allocated and the project development phase was completed. However, there is a lack of clarity

Fig 7. Participants during the workshop "Understanding The City"

about the current stage of the project. Additionally, it was stated that there are two major challenges in Khorog: considerable lack of land and employment opportunities. Current Building codes and regulations are aligned with disaster management strategies and with the modification of the SNIP in 2020, some regulations have been changed to accommodate these. These changes require that the General Plan be adjusted to ensure compliance with current regulation. A study of vacant land suitable for development should be a priority to accommodate future population growth and environmental migration.

3.7. THEMATIC AREA II: SOCIO-ECONOMIC AND INFRASTRUCTURE RESILIENCE

Presenter: Anastasia Ignatova

Key presentation points:

Reactions to the Presentation:

The Mayor of Khorog, Alisher Micronation, pointed out that the open-source data presented in the section on socio-economic and infrastructural resilience is not correct and requires verification. More specifically:

- The number of tourists visiting Khorog/GBAO/ Tajikistan requires updating. The Mayor stated that official statistics indicate that 15,000 tourists visited GBAO in 2019, while in 2020 only 500 tourists could visit the oblast due to the COVID-19 pandemic;
- The data on informal development requires verification. There are no informal buildings in Khorog, construction of any type is only possible with permission;
- In Khorog there are five public transportation routes. Only two were presented in the section.

Alisher Mirzonabotov emphasised the importance of collaborative work and a strong will to engage in the programme to achieve impact in the city. Khorog is a dynamically developing city thanks to the Government of Tajikistan. The city government is willing to assist in data collection and validation. The project process and findings should be validated with the local government before further use or presentation. The Government of Khorog, together with the citizens, will contribute to the recommendations for successful implementation of the project.

Naboot Dodkhudoeva, the Head of the public organisation "Madina", stated that engagement with

Challenges	Opportunities
High unemployment rate coupled with a large percentage of youth	Multi-cultural unique context
Limited job opportunities	Large percentage of young people as a driver for future development
Proximity to unstable areas of Afghanistan	Stable population dynamics
Difficult ecological conditions, natural disasters affecting well-being of the population	Stable demographic situation, potential population growth
Strong dependence on remittances (40% of national GDP)	Large percentage of people with high level of education
Dependence on donor assistance to finance socio-economic projects	Developing tourism sector in Khorog
Outdated/unreliable infrastructure that does not support current needs	Development of UCA as an incentive to mobilise and attract resources
Insufficient level of infrastructure in the field of energy and transport	Availability of projects and efforts to rehabilitate infrastructure
Strong dependence on weather conditions	Presence of renowned academic institutions in Khorog
Limited mobility and heavy dependence on roads	Unique religious and cultural identity due to preservation of cultural traditions in Khorog
Limited access to basic urban services - water, sewerage and electricity	Connectivity with the nearby city centres
	Increasing capacity of UCA – potential increase of job opportunities

Table 4. "challenges and opportunities" summary

civil society is crucial for the programme. Civil society should be aware of the planning process and play an active role in the decision-making. The data on income that was presented was not accurate, and it was advised that the analysis requires further alignment with reality, especially in employment data as Khorog is one of the poorest cities in Tajikistan. The lack of land is an additional and connected challenge that prevents people from practicing expansive agricultural activities. The actualised analysis should be presented to experts for a second round of revision, especially regarding the socio-economic thematic area. Considering the creation of new job opportunities is crucial for the project.

Malika Giles and other facilitators concluded the thematic area discussion by emphasising the importance of the workshop as a first step to validating the data and gathering all stakeholders together. Understanding the priorities among the government, civil society, and other partners is crucial. The project is impossible without the participants.

Other discussion points:

- The numbers presented should be corrected within two months after the workshops;
- All existing projects and practices taking place in the city should be considered in the project as well as previous efforts;
- Collaborative work is important to avoid any confusion, Khorog has the capacity to assist with data verification.

Fig 8. UN-Habitat online presentation during the workshop "Understanding The City"

3.8. THEMATIC AREA III: ENVIRONMENTAL RESILIENCE

Presenter: Anastasia Ignatova

Key presentation points:

Summarized in the form of "challenges and opportunities" table.

Challenges	Opportunities
Urbanisation and land scarcity	Strong capacity for developing risk analysis
Natural disasters and increased unpredictability of climate change	Awareness of environmental concerns in all of the population
Location and geological processes that increase the risk of natural disasters	Availability of support in the region from the government, donors, and strategic partners
Limited integration of climate change matters into urban planning	
Limited capacity to mobilise resources quickly in response to natural disasters	

Table 5. "challenges and opportunities" summary

Ruslan Bobov, the Head of Administration in AKDN stated that UN-Habitat should utilise the analysis undertaken by AKAH on lake mapping, which was conducted from 2015 to 2020 with the planning and design institution in Moscow. The AKAH analysis provides comprehensive information that is crucial to consider. It is important that this data is provided to the project team to include in the analysis. In 2019 further analysis was conducted on the geological condition of Tajikistan in which risk zones were identified. This analysis is also available.

Umed Tutishoev, the Head of CoES stated that safety should be a key component of the project. The majority of new housing is being constructed on at-risk territories. Khorog is the least resilient city to natural disasters in the country. The project should identify the areas that are suitable for construction and include a relocation strategy.

Malika Giles suggested that technologies have advanced since the General Plan of Khorog was approved in 2010 and provide great opportunities to deepen the existing analysis. It is essential to integrate

all the recommendations and responses into the project.

The Mayor of Khorog concluded the discussion by stating that the city government is always ready to provide recommendations, feedback and to collaborate. It is important to identify areas suitable for development, as nearly all areas of the city are prone to disasters. After the implementation of the project, some challenges will remain, if items such as canalisation systems are not addressed. In spring, it is difficult to walk along the river's left bank due to the lack of canalization infrastructure. Upgrading canalisation should be a priority, and special attention should be paid to the water supply system.

Other discussion points:

- A 12-storey development has been a point of contention as to whether the building aligns with safety regulations regarding earthquakes. Citizens are worried and are discussing this very actively;
- It is important to provide an answer on whether this type of development is safe, based on detailed analysis, and if not – to provide a strategy for actions in this case;
- The Geological study on the city was conducted in 2019 and transmitted to the Committee of Emergency Situations. The study can be utilised in further analysis. This type of analysis should be provided to the Mahalla;
- It is mandatory to use technical studies (flood scenarios, geological analysis, etc.) in the General Plan; thus, the Plan is already based on some projections;
- Poor ecological conditions, such as degradation of vegetated areas in floodplains is the cause of flooding in Khorog;
- In Khororg deforestation of wild bushes with long roots has increased the impact of flooding;
- The discussion should tackle not only potential responses, but root causes of disasters. The meeting was concluded by all the facilitators with words of thanks for a productive session and expression of plans to conduct a second workshop in April of the same year.

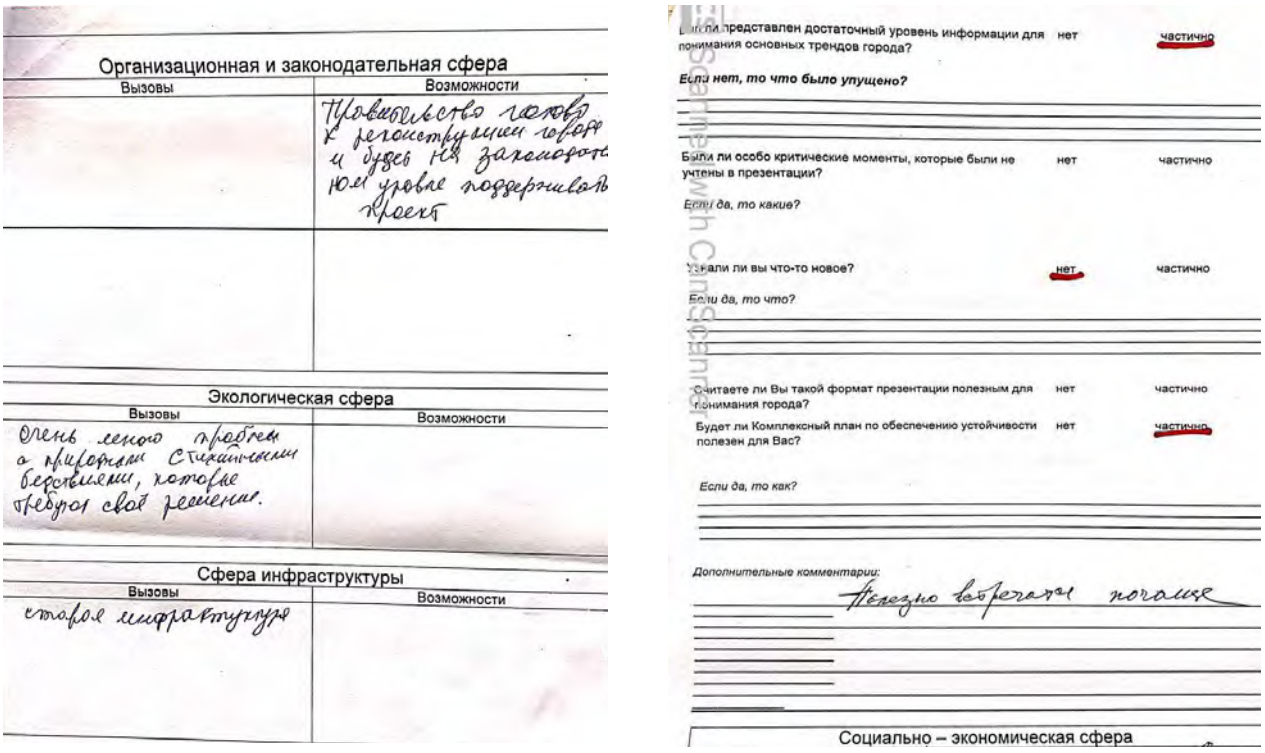

Fig 9. Example of the filled form and a questionnaire during the workshop.

BOX 1: KEY EMERGING ISSUES

Aspect of misunderstanding on the status of the General Plan

It was observed during the workshop that there is a lack of common understanding between the technical experts and political leaders on the current status of the General Plan. Though it was emphasised that Khorog has an approved General Plan, this requires verification with all the stakeholders.

Lack of capacity

It was stated that a lack of technical planning capacity is a challenge not only in Khorog but all over Tajikistan. Very often, practitioners do nott utilise the General Plan or other normative tools.

Outdated General Plan

The General Plan of Khorog was developed according to all necessary norms and standards, however, it no longer responds to current socio-economic and spatial needs. Moreover, some norms and regulations have been changed requiring that the Plan be updated.

Lack of topographic survey

To proceed with the actualisation of the General Plan, it is critical to complete the topographic survey to ensure clear compliance with conditions on the ground.

Data gap in the analysis provided

Several participants indicated that figures tourist numbers and employment are incorrect. To proceed with the analysis, it is crucial to update these figures.

Previous studies are not considered

During the workshop comments were received that some important studies were not utilised in the analysis, such as lake and geological analysis undertaken by AKAH.

Citizen concern

It was stated that people in Khorog are concerned about their safety, especially regarding the alignment of a 12 storey development with safety regulations.

BOX 2: FURTHER RECOMMENDATIONS AND NEXT STEPS

Actualisation of the analysis

Data on employment and tourism should be adjusted according to the participant feedback and validated by experts. It is suggested that the analysis should be updated before the next mission and validated during the 2nd workshop, in accordance with the recommendation of the Mayor (to update the analysis within two months)

Enhancing engagement with the civil society

During the workshop, the importance of public participation was emphasised. Civil Society engagement is a cornerstone of the UN-Habitat approach, and civil participation will be ensured throughout the planning process.

Including previous studies in the analysis

During the workshop, it was noted that critical pieces of analysis undertaken before the programme commencement were not considered. These included lake mapping conducted from 2015 to 2020 by AKAH in collaboration with the planning and design institution in Moscow and an AKAH study on the geological conditions of Tajikistan, conducted in 2019. The project team should be provided with these to include them in further analysis.

Considering the Mahalla in the analysis

During the workshop, participants were discussing challenges and opportunities at the neighbourhood scale. It is important to ensure that the analysis includes the Mahala scale, especially regarding the risk analysis. Sample recommendations at this scale could also be provided (e.g. developing the riverfront, creating a system of public spaces, etc.). Sample recommendations at the neighbourhood scale should respond to citizen concerns, and provide clear explanations of the development strategy.

Identifying safe areas suitable for development

It is critical to identify areas suitable for development, as it was noted that there exists a considerable lack of housing in the city. Identification of safe areas should also be included in the recommendations on relocation, which will form part of the comprehensive disaster response strategy. To facilitate the study, it is critical to first conduct vacant land mapping in Khorog.

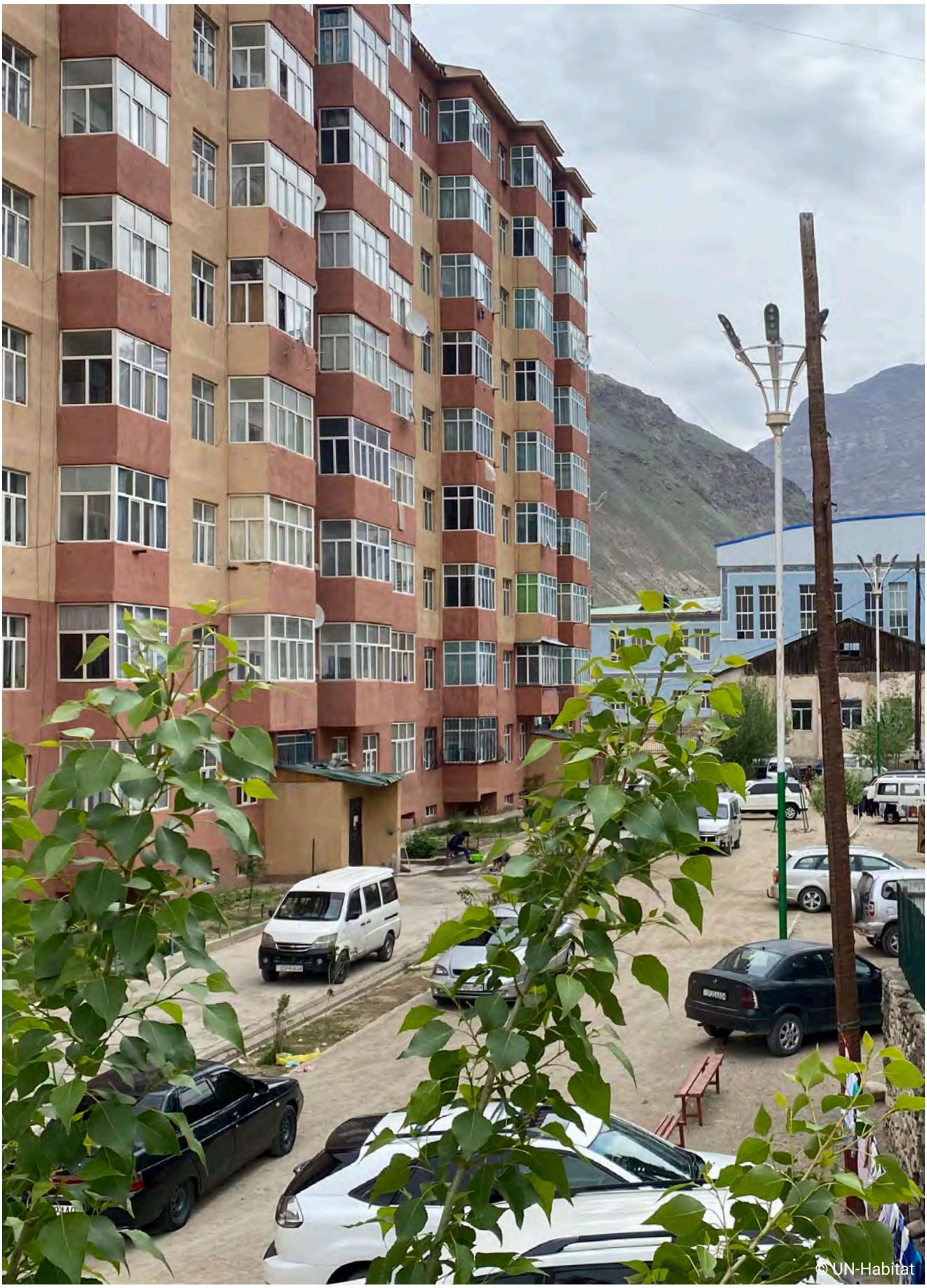

Fig 10. Apartment building in the central area of Khorog, May 2021

4

WORKING SESSION WITH SECO AND UCA EXPERTS

On the 25th of March 2021, the project team conducted a workshop with SECO technical experts and representatives from UCA. The presentation contained updated information from the "Discovery and Understanding" workshop. During the session, technical aspects such as data relevance were discussed alongside the strategic opportunities for socio-economic development.

Key discussion points:

- There are currently discussions taking place in Tajikistan on how to integrate/achieve the SDGs in planning at the local level;
- Currently in Tajikistan General plans lack environmental indicators to monitor, which constitutes a considerable gap;
- There is a lack of official geological data country-wide. However, in Khorog this issue has been partially resolved by AKAH, which has conducted its own geological studies. It is also important to address this issue at the regional, national scale;
- There is a critical challenge in the accessibility of data even when the data exists. It is important to make the process of data collection and sharing more transparent;
- There is an opportunity to develop a systematic approach to hazard analysis in the country. If a systematic approach towards risk analysis is applied, hazard unpredictability can be reduced;
- It is important to have population forecasts to generate pre-emptive methods and locations to accommodate the growing population;
- Currently there is no regulatory framework to limit urban expansion in the hazard zone;
- Khorog is situated on the "Silk Road" to china. The location close to the border with China may provide opportunities for Khorog as a potential centre for commerce and culture; There are no current benefits generated for Khorog by the road connecting to China, and no tax or customs services;
- It is important to focus on affordability of future housing. This will require analysis on the functions of mortgage schemes as people do not currently have any security. When proposing new development, it is critical to analyse the associated risks;
- State service providers have limited capacities;
- Proper planning and base-level data should be in place, these are critical factors which will bring benefits from future investments.

Fig 11. A house damaged by rockfall , May 2021

5

"LEARNING BY DOING" AND FIELD MISSIONS

In accordance with the Participatory Incremental Urban Planning (PIUP) approach, the project team conducted two field missions to Tajikistan to ensure all stakeholders were engaged in the planning process and production of outcomes in a meaningful way. The key objective of the missions was the validation of findings and assumptions "on the ground", in close collaboration with the local communities. Due to travel restrictions, the team merged several objectives from the two phases ("Discovery and Understanding" and "Diagnosis") of the project for the first mission which took place from 28.03.2021-03.04.2021. During the mission, the teams from UN-Habitat Urban Lab and AKAH conducted technical workshops with critical stakeholders such as the planning authority Shahrofar and the main architect of Khorog. The working sessions included mapping of critical urban features (Rapid Planning Studio) by the stakeholders, which was later analysed further and included in the analysis results. The project team also raised awareness about the current planning initiative in Khorog and principles of sustainable development applicable to the context, ensuring the establishment of stronger partnerships with Shahrofar and the chief architect in a "learning by doing" process.

5.1. MISSION OBJECTIVES

The field missions set a number of key objectives, as follows:

- Conduct participatory working sessions and workshops with key stakeholders;
- Conduct technical sessions and discussions to ensure a "learning by doing" process with a training component for city officials on key issues of sustainable development, urban planning, legislation, environmental resilience, urban design principles and public space, use of data for evidence-based decision making, infrastructure, and financing;
- Conduct site visits to validate findings and recommendations, ensuring active participation of local communities in the process;
- Ensure on-site data collection through observations and participatory events (evaluating public space quality and use, housing typologies, types of vegetation, etc.);
- Validate information and data collected with local technical experts and stakeholders;
- Conduct interviews with representatives of national and local authorities, and technical experts on urban planning, land regulation, and environmental issues to identify development challenges and opportunities, and to later refer to when evaluating recommendations;
- Increase the visibility of the project in Tajikistan to showcase the application of sustainable development principles in Khorog and set an example for other cities in similar contexts;
- Conduct meetings with donors to build synergies and promote investment sustainability, while ensuring programme continuation.

5.2. SUMMARY OF KEY EVENTS

5.2.1. Working session with Shahrofar

On the 30th of March, 2021 the project team conducted a working session with urban planning experts Gulbahor Davlyatova, Dina Ismakova and Munavar Mursaidova at Shahrofar. During the session, key challenges in the city and major planning trends of the country were discussed in the context of the current urban legislative framework. As the General Plan of Khorog was not shared with the project team (due to its classified status), experts discussed the process of plan approval, norms and regulations in urban design, and local resilience strategies.

Key Discussion points:

- Gulbahor Davlyatova briefed the project team on the process of plan approval, current norms, regulations and codes. The materials were shared with the project team;
- Shahrofar briefed the project team on the mandate of the agency responsible for urban planning for the whole country and its vast work experience across Tajikistan. Shahrofar has conducted multiple studies and projects in Khorog, including the "Khorog City" project near Tem, designed to function as a satellite neighbourhood to accommodate population growth;
- UN-Habitat explained the project activities and overall intentions of the project, emphasising the importance of collaborative work with the planning agency. The team briefed Shahrofaron UN-Habitat planning principles and their application in context;
- Shahrofar experts explained the key materials upon which the General Plan was based (a map of the regional planning, geological studies, etc.). Shahrofar pointed out that the General Plan includes considerations on disaster mitigation measures as it is required by the urban planning code;
- Representatives of Shahrofar expressed willingness to collaborate and stated that the programme can support and complement the work of Shahrofar which is focused on the revision/actualisation of the General Plan and site planning;
- Shahrofar pointed out the challenges in the capacity of local city authorities to implement plans. The agency also faces challenges in a lack of human resources and financing. Innovative solutions are required;
- Shahrofar briefed the UN-Habitat project team on the key development patterns in the city and previous recommendations (such as terracing, etc.), indicating their location on a map prepared by Shahrofar.

Fig 12. Working session with urban planning experts Gulbahor Davlyatova, Dina Ismakova and Munavar Mursaidova at Shahrofar, March 2021

5.2.2. Working session with the Chief Architect of Khorog

On the 2nd of April the UN-Habitat project team conducted a workshop with the Chief Architect of Khorog at that time, Alisher Geibnazarov, and the head of Infrastructure Planning for AKAH, Mamadnazar Mamadnazarov. The objective of the workshop was to validate the findings from the analysis that had been conducted by the UN-Habitat team, leading up to this meeting, and to and identify gaps in preparation for the stakeholder diagnostic workshop. The team discussed potential recommendations on the basis of the diagnostic maps.

The session included a rapid planning studio: participants conducted a joint mapping exercise indicating all the challenges faced by the city and data gaps. The Chief Architect and technical team of AKAH updated the information on natural hazards and city facilities. The session provided a more comprehensive understanding of the Khorog context and potential future approaches. To facilitate the latter, the session participants provided information on key opportunities for Khorog such as the development of tourism, promotion of local traditions, culture, future economic activities (herb plantation, hand crafts, etc.), and rehabilitation of the public space network, especially the botanical garden, which functioned as the main public space for the city during the Soviet era. The presence of the airport was emphasised by all the stakeholders as a key potential tool to bolster the local economy, attracting international tourism, investments and human resources.

The rapid planning studio took approximately 3 hours, with short discussions and documentation review. The session outcomes (notes and a comprehensive map) were integrated in the project materials to be presented during the diagnostic workshop.

Fig 13. Map development during the rapid planning studio, April 2021

Fig 14. Workshop with Alisher Geibnazarov (Chief Architect of Khorog), April 2021

BOX 1: KEY EMERGING ISSUES

The General Plan can't be shared

Due to the classified status of the General Plan, it cannot be shared with the team for further assessment.

Lack of capacity

It was highlighted by Shahrofar that the agency capacity is limited and requires additional training in capacity-building sessions to ensure their work can follow current urban planning trends. There is also a further lack of capacity in local governments across the country to develop and implement plans.

Hazard and facility data need to be updated

It was identified during the rapid planning studio that the comprehensive diagnostic analysis has several information gaps which were attributed to limitations that prevented the project team from conducting the field visit to Khorog.

BOX 2: FURTHER RECOMMENDATIONS AND NEXT STEPS

Collaboration with all stakeholders

As the General Plan itself cannot be shared, it is important that all the stakeholders participate in the planning process and project events to comment on key messages of the General Plan during the discussions and mapping exercises.

Capacity building component

As a lack of capacity was identified in previous events, it is important to develop a capacity-building component of the project that can be integrated into its processes. The component should include an initial assessment of capacity needs to develop targeted events and technical training in accordance with the findings.

Updating the data

It is essential to ensure that the city diagnosis includes valid data, verified by the community and technical experts. To achieve this, it is also important to update the comprehensive analysis, including the findings of the rapid planning studio, with The Chief Architect and AKAH technical team.

6

STAKEHOLDER WORKSHOP "CITY DIAGNOSTICS AND RECOMMENDATIONS"

The "City Diagnostic" workshop is the second major participatory event designed to generate a collective vision of future growth and its spatial implications. The workshop is planned as a mechanism to validate the recommendations and action plans developed by the technical teams, supported by guidance from the local authorities. Before the workshop, all data sources were verified and updated to include the findings of the discovery workshop, and additional stakeholders were consulted, including those from academia, representatives from local utilities providers and community leaders. Multiple community engagement events were also conducted prior to the second workshop, in which further data on challenges and opportunities in the city was collected. Some findings (e.g. Sector-specific economic opportunities and mechanisms to increase employment) were incorporated in the analysis presented to stakeholders in the second workshop.

Expected Outcomes:

- Increased awareness of the planning process, particularly of the diagnostic phase;
- A unified vison of the six key issues faced by the city and their categorisation by urgency as urgent, medium-term, long-term;
- A unified vision of the strategic recommendations/responses and best practices;
- A unified vision on the potential areas for targeted action plans;
- Clarity established among the stakeholders on further actions;
- Active engagement of all the stakeholders in formulating spatial strategies;
- Active engagement and awareness built on the project process and outcomes among the community.

6.1. WORKSHOP OBJECTIVES

The objective of the diagnostic workshop was to establish the core needs of the city through the participation of a diversity of stakeholders, provide a summary of the critical challenges/issues and current opportunities to leverage, and to use these discoveries to establish a future vision for Khorog. The project team presented six strategic recommendations in the workshop in response to the six major city issues identified in the first workshop. The aim of this presentation was to facilitate a discussion on the extent to which these recommendations might align with the needs of the city and current capacity levels to ensure clarity on further actions among all the stakeholders.

6.2. WORKSHOP LOGISTICS

The workshop was a part of the mission conducted by the project team to Tajikistan from the 17th of May to the 3rd of June, 2021. The workshop was held on the 25th of May, in the Ismaili Centre, Khorog. All participants attended the event in person though some presenters attended the event online. The workshop participants included government officials at local, regional and national levels, representatives from the line ministries, academia, civil society, and management and technical teams from AKAH and the UN-Habitat Urban Planning and Design Lab. The workshop was facilitated by representatives from the Aga Khan Agency for Habitat and the UN-Habitat Urban Planning and Design Lab.

6.3. PARTICIPANTS

Government	**National**	Ulugbek Umarzoda	First Deputy Chairman of the Committee for Architecture and Construction
		Khurshed Burkhonov	Representative from the Committee of Architecture
	Regional (GBAO)	Aydarmamad Gulmamadov	Chief Architect of GBAO
		Soro Ofaridaeva	Representative from the Khorog Investment Department
		Fayzullo Qodirzoda	Deputy of the Mayor
	Municipal	Shaikh Shaikhov	Chief Architect of Khorog
		Maroddbek Sufishoev	Head of KMK
		Zarifkhon Zarifkhonov	Head of Vodokanal
		Umed Tutishoev	Head of CoES Khorog
PPP (Public Private Partnership)		Jamshed Shosafedov	Representative from Pamir Energy
		Gulasan Saidmamadov	Representative from Pamir Energy
		Ofarid Amirkhonov	Head of Operations Pamir Energy
		Shirinbek Mazambekov	Head of DRR and GIS Pamir Energy
Civil Society		Nasim Rahmatshoev	Representative of Public Organisation Madina
		Nurmamad Jonmamadov	Head of Jamot I. Somoni
Academia		Dastanbui Mamadsaidov	Representative from UCA
AKAH		Hadi Husani	AKAH CEO
		Zafarbek Kuvvatbekov	AKAH Country Operations Manager
		Tokhir Sabzaliev	Head of Operational Research and Technical Department
		Malika Giles	Programme Manager
		Rukhshona Makhsudinova	Urban Planner (KURP)
		Mamadnazar Mamadnazarov	Head of Habitat Improvement Department, AKAH
		Masrur Mirgharibov	Capacity Building Officer, Government Support Unit
		Navruzsho Afzalshoev	Capacity Building Officer, Government Support Unit
UN-Habitat		Herman Pienaar	Head of the Urban Planning and Design Lab
		Pinar Caglin	Project Lead
		Maia Smillie	Urban Planning and Design expert
		Anastasia Ignatova	Urban Planning and Design expert
		Ban Edilbi	Urban Resilience expert
		Mario Tavera	Planning and GIS expert
		Anna Kvashuk	Urban Legislation and Governance expert
		Zafar Avzalshoev	Local Urban Infrastructure and Planning expert

Table 6. Workshop participants

6.4. WORKSHOP SUMMARY

The workshop consisted of three major components/ thematic areas:

1) Comprehensive presentation on the diagnostic methodology, data synthesis and analysis,
2) Analysis of current legislation to strengthen institutional resilience,
3) Presentation of identified issues and responses,
4) Snapshots on potential urban regeneration solutions and next steps.

The presentation was conducted in English with translation to Tajik to ensure stakeholder understanding. The component on institutional resilience was provided in both English and Russian. A 10-15-minute group discussion was held after the presentation of each thematic area. The workshop included a vast range of participants from different levels of government, civil society, academia and the private sector. Despite efforts to ensure gender balance in the workshop, it is recommended that the project team continue to emphasise the importance of female participation in further activities.

The stakeholders expressed their will to collaborate in future activities and validated the issues identified and strategic recommendations that were presented by the project team. Ulugbek Umarzoda, the First Deputy Chairman of the Committee for Architecture and Construction, stated that the collaborative nature of the work is very much appreciated, as the city of Khorog is in need of systematic transformation. It was stated that the current project can complement and strengthen the ongoing initiative to actualise the current General Plan. The First Deputy Chairman stated that critical elements of urban planning including complexity, ecology, functionality, openness, and style should be considered. It was further stated that it is critical to give a comprehensive explanation of urban resilience and related issues to ensure that there is a common understanding on what urban resilience constitutes among all the stakeholders and proceed with the work in a productive manner.

The project team gave a comprehensive explanation of recommendations using data analysis and diagnostic evidence, recognising any data gaps that will require addressing further in the report. Throughout the workshop, participants responded to the information and recommendations provided and identified issues (see Table 7) and potential responses.

Key presentation points/aspects[i]:

Summarized in the form of a table with identified issues and responses.

Issues	Responses
Urban expansion in hazard zone	Growth restriction & hazard mitigation
Limited vacant land	Urban regeneration & utilization of under-used areas
Fragmented urban fabric	Mixed-used economic centres & permeability of urban fabric
Car dependency and lack of pedestrian linkages	Infrastructure for NMT & public space network
Insufficient utility infrastructure	Improvement of utility infrastructure

Table 7. identified issues and responses.

Fig 15. Participants during the "City Diagnostics and Recommendations" 1, May 2021

Reactions to the Presentation:

Participants suggested that the growth restriction boundary is an appealing strategy that can be applied across the country, however, it is critical to look for alternative options to the relocation of people who are already residing in areas affected by hazards. The representative from the Committee for Architecture and Construction commented that it is important to include the area of Tem in the recommendations as it has already been the site of a 242 hectare project to accommodate population growth. In response to the suggestion, the project team gave a comprehensive explanation on the reason for which Tem was not included in the project. Comprehensive evidence was provided, focusing on the project's potential for positive socio-economic and ecological impact once the current land capacity is utilised. It was agreed that the opportunity to regenerate underdeveloped areas with the current built-up area should be considered closely.

The recommendation to revitalise the "blue and green" network and improve pedestrian linkages across the city was positively received, however, it was stated that the riverfront area engenders a number of specific challenges to any interventions, especially as it is restricted from any construction. In response to this comment, the project team shared their experiences of walking across the riverbank as there is already a system of informal pedestrian paths that could be enhanced. It was agreed that the proposal to construct pedestrian bridges to the botanical garden will significantly improve the overall connectivity and positively impact the everyday life of citizens.

The proposals for infrastructural improvement were positively received, however, it was noted that there are resource challenges. It was highlighted that irrigation must be addressed in further recommendations. There were also comments noting that there are several existing projects underway targeting the city infrastructure, and that, therefore, it is important to have a consolidated vision that will prevent overlap or contradictions of different initiatives that would damage the overall sustainability of the project. Participants commented on waste management as a critical issue requiring urgent address as the lack of waste management has begun to affect the environment. It was suggested that all key service providers should be involved in the planning process to ensure that funds are used efficiently and that actions can be prioritised. It is important to begin discussions on the introduction of a unified billing system, however, before this can take place, there are several challenges to be addressed in service distribution. For example, water supply assessment categorisation of issues in terms of urgency has already been deemed a priority and there is a plan in place to resolve 70% of the issues in the next 3 years (by 2024).

Fig 16. Participants during the "City Diagnostics and Recommendations" 2, May 2021

The UN-Habitat Urban Lab team concluded the workshop by emphasising the importance of the validation process for strategic responses among all the stakeholders. The diagnosis workshop was the second major participatory event during which the future vision for Khorog was established by the government, professional society, civil society and the private sector.

Other discussion points:

- The introduction of the relocation strategy is likely to be a sensitive topic and it is important to ensure active participation of communities in the planning process.
- The underdeveloped land within the built-up area is a valuable recourse, and it is important to examine the proposed areas for regeneration in detail. Land ownership may prove challenging as these lands are private.
- 16 tonnes of waste are taken out of Khorog every year, making waste management solutions critical.
- It is important to consider rehabilitation of the current irrigation system.
- It is important to ensure that the facilities are resilient, especially those which are strategically located considering population density and areas with high accessibility, as well as those outside of hazardous areas.
- The Khorog Resilience Programme includes 24 recommendations for water supply improvement.

Fig 17. UN-Habitat presentation on urban legislation, 2021

Fig 18. UN-Habitat presentation on City Diagnostics, May 2021

BOX 1: KEY EMERGING ISSUES

Gender balance during the participatory event

Despite the active participation of women during the community engagement exercises, there were few female participants during the diagnosis workshop

Relocation strategy as a sensitive topic

As it was stated during the workshop, any relocation from hazard zones is considered a sensitive issue. It is important to provide people with good housing options as an alternative, prior to relocation.

Water meters as a sensitive topic

Introduction of water meters can be a sensitive topic due to the high level of poverty and quality of the water supply.

Land ownership of areas identified for regeneration

Underdeveloped areas proposed for regeneration are privately owned, which might present a challenge to their further development.

Planned city extension in Tem

The project in Tem (referred to by the participants) may negatively affect the development of Khorog as the distance from the centre of Khorog and lack of localised amenities carry cost implications in the far-reaching extension of infrastructures and are likely to increase vehicular dependency, negatively affecting the environment.-

BOX 2: FURTHER RECOMMENDATIONS AND NEXT STEPS

Ensuring gender balance during further events

It is important to ensure a stronger emphasis on gender balance during further activities. The feedback from women during the community engagement activities should also be taken into account at further stages.

Ensuring active community participation community during project next steps

Due to the sensitive nature of some recommendations it is strongly recommended that community engagement form a central focus in the development of action plans and detailed proposals. The heads of Mahallas should be also consulted, especially regarding relocation strategies and installation of water meters.

Piloting specific initiatives

It is suggested that pilot projects should be introduced for interventions in select thematic areas to test citizen perception. For example, water meters might be installed in a selected area at the Mahalla or sub-Mahalla scale that experiences fewer supply challenges.

Enhancing and attracting Public Private Partnerships

As was stated during the workshop, selected areas of underdeveloped land that fall within the built-up area may be attached to titles for exclusive use. The capital investment plan and financial strategy developed during the second phase of the project will address the issue of land ownership, showcasing the potential attractiveness of investing in underdeveloped land, and exploring mechanisms for financing projects through public-private partnerships.

Enhancing principles of sustainable development

To ensure that there is a common understanding of urban resilience and sustainable development, the UN-Habitat principles for planning (A New Strategy of Sustainable Neighbourhood Planning, five principles) will be articulated in the recommendation report. All evidence (including comparative density analysis) will be provided to ensure a comprehensive explanation of the importance of utilising existing land resources.

Fig 19. A pathway to traditional pamiri house, May 2021

7

COMMUNITY ENGAGEMENT

During the second mission to Tajikistan in which the second workshop was conducted, the project team also conducted a series of community engagement events such as community gatherings and a "walking and talking" exercise. Community engagement events were used as an intensive planning and design tool to address the core concerns of residents and stakeholders in a targeted area. The project team put a strong emphasis on an inclusivity, engaging different social demographics, especially youth, people with disabilities, and people in vulnerable situations to ensure that no one was left behind.

7.1. COMMUNITY ENGAGEMENT OBJECTIVES

The key objective of the community engagement exercises was to integrate the community's perceptions about their urban environment, key challenges, and places people value most and why. The activities were designed to raise awareness about the programme and to collect data on the ground to ensure that recommendations and potential design proposals are targeted to address the community needs.

Objectives of the community gathering:

- To understand critical challenges in Khorog;
- To understand critical opportunities for future development;
- To gather information on current best practices in economic development, local hazard mitigation measures and community resilience;
- To build relationships with the community for further interactions/activities and to build awareness among the community about the project;
- To collect data for the city assessment/ diagnostic to ensure the recommendations are appropriate and targeted;
- To validate analysis and findings;
- To understand the relationship between the city and the community.

Expected Outcomes:

- Better understanding of Khorog (challenges, best practices);
- Increased community knowledge on the programme;
- Data collected on the ground, essential for potential design proposals;
- Relationships with the community for further activities;
- Findings validated and gaps identified.

7.2. COMMUNITY ENGAGEMENT LOGISTICS

The community engagement activities took place on 22nd May 2021, in Khorog and consisted of two major components:

1) Community gathering and discussion,
2) "Walking and Talking" exercise.

7.2.1. Community engagement gatherings:

Community gatherings were designed as a model of community focus groups, for which a cosy venue was provided by project partners. A coffee break was organised to facilitate informal communication. The community was divided into 3 groups (3-5 people per group) to ensure everyone could contribute to the discussion. Two project team members were allocated to each group to ensure communication in both

English and Russian languages. Prior the event, the project team established several recommendations for the focus group compositions to ensure objective feedback and homogeneous data collection. These recommendations were:

Age:

- Representative(s) of the age group > 60/65
- Representative(s) of the age group 30-45
- Representative(s) of the age group < 18-30
- Representative(s) of the age group <18 (accompanied by a parent)

Social status and occupation:

- Teachers
- Traders
- People engaged in the tourism sector
- Small business owners
- Unemployed

Settlement: representatives from different Mahallas, especially those from:

Shotemur	Bizmich
Shifokhona	Imomobod
Nivodak	Dashti bolo
Khufak	Chukht Khorog
Barjev	Andarsetez
Myaskambinat	N. Kisrav
Khlebixavod	Ayni

Gender

- Gender balance 50/50 is desirable

7.2.2. "Walking and Talking" exercise

After the community gatherings, community members took the project team for a walking activity to show an example of traditional housing and places they deemed critical for observation (such as areas at risk, local hazard mitigation techniques, etc.). The "Walking & Talking" method was designed to probe the relationship between people and place, specifically the relationship between a person and the places that are are significant to them. The exercise was proposed as participants are likely to be more relaxed when reporting personal experiences in relation to a place. Furthermore, in-situ recounting more deeply connects participants to lived experience allowing emotions to be relieved and triggering more accurate memory recall for the most accurate descriptions of place. The explorative nature of the activity, provides both quantitative and qualitative data, generated by physical experience.

Prior to the walking tour, participants were asked to identify their places of personal significance to be visited, taking into the account reasonable time-frames. The trajectory of the walk was established in advance by the focus group in this way, taking into the account:

- The necessity for a comprehensive walk across different parts of the city (including different Mahallas)
- The showcase of places of importance for the analysis, of both positive and negative value

7.3. PARTICIPANTS

Name	Occupation
Maqsud	Blogger
Zohir	Entrepreneur
Anjirbegim	Former Mayor of Khorog
Shuhrat	Computer Programmer/AKAH
Sultonazar Kholiqnzarov	Former CoES
Dilshodbegim	Community AKAH Volunteer
Niyat	Volunteer
Alim	Historian
Zarina	Community Volunteer
Maria	English Instructor
Fotima	English Instructor
Roziyamo	AKAH
Gulanor	Entrepreneur
Shifo	Entrepreneur
Tolik	Documentary Filmmaker
Sulton	UCA Professor
Dilya	Community Volunteer

Table 8. Community engagement exercises participants.

7.4. COMMUNITY ENGAGEMENT SUMMARY

The community gathering:

Focus group 1

Several challenges and potential responses were identified during the discussion among focus group 1. One of the key challenges highlighted was that many people's homes or apartments required some manner of repair but there is no substantial system of support. A suggested response was that after school training programmes for youth, partnerships with relevant organisations and special classes for children could be organised. A second significant challenge identified was that workers are discouraged from working with/for private companies as there is a lack of state support for private enterprise. Enhancing private public partnerships is critical for activating the economy in Khorog.

The community group stated that the quality of certain facilities and infrastructure requires improvement. Local communities feel unable to maintain social facilities (such as community centres and deteriorating Soviet buildings). The conditions for the government officials are not enabling (low salaries), which leads to a lack of political will to develop policies and efforts to provide maintenance for the facilities and support local initiatives to improve the environment. Despite challenges, multiple opportunities were discussed, such as the active participation of volunteers in community life. A participant who runs a local volunteer group pointed out that some volunteers find funding on their own, using social media to support the community. For example, volunteers raised funds for home construction (19,000 USD) and the purchase of tools for women to start their own cooking businesses after a hazardous event destroyed their homes. Further mobilisation of the community will be possible with more support from the government. Moreover, it was suggested that community leaders should be more politically empowered as they play an active role in the lives of the citizenry.

The need for psychological support for all ages was also discussed by the participants. It was pointed out that a sense of uncertainty negatively affects the social and psychological condition of the community and its members. For example, the sense that land can be revoked from communities is very present and creates continued stress. Renovation or changes in the city should take place through close consultation with affected people.

Fig 20. Group session 1

The group also outlined a number of challenges in the urban development of the city. Participants noted that "The city has grown in a chaotic way" and requires more comprehensive organisation. For example, it is very difficult to find what one needs in the central market. Regularising the market area may be a useful pilot project for the community.

In conclusion, group one suggested that investments should be allocated in a more sustainable manner. It was stated that it is critical to build awareness among government officials about the use of best practices being exercised outside the region.

Focus group 2

The discussion in the second focus group was centred around best practices and personal experiences. Community volunteers, Maria and Fotima, organise camps, training for social skills and securing scholarships to study abroad, and facilitate female empowerment. They also organise cultural exchange programmes with tourists visiting the city, such as English exchange programmes of two to three weeks. Zohir was a representative from local business owners. He opens mobile cafes around the city, collaborating with AKAH to provide data literacy and computer skills training for youth. His organisation works in four thematic fields: computer literacy, ecology, volunteerism and social enterprise. His organisation is promoting behavioural change to facilitate a switch to sustainable modes of transportation. To facilitate this his organisation is installing shared bikes and mobile bike repair shops in Ishkashim, Mugrab, Davroz, Rushan and Khorog with an emphasis on organising bicycle training for girls. Zohir identified street safety as a critical issue of multiple factors (e.g. street dogs attacking cyclists, unregularised parking space, etc.). During the group discussion, several examples of community initiatives were provided, such as skill training camps, production of short movies about waste collection, and the installation of public libraries which teach the public ownership and community creation of facilities for public use.

An English instructor shared his experience of teaching in Khorog. He mentioned the impact of COVID-19 during a period when everything was closed, the internet connection was poor, and it was not possible to conduct lessons. He mentioned that Khorog is lacking coworking spaces where it might be possible to conduct extra classes with those interested.

Tolik, a documentary filmmaker, suggested that public art requires more support from the government. Currently, different art and movie festivals are organised in the city and can be supported further by the government. It was motioned that culture and local arts as well as traditional medicine and tourism facilities are potential aspects that can attract people to Khorog.

There is a significant number of volunteers, in various fields in Khorog. Dilshodbegim became a volunteer at the age of 13 and is now employed by the AKAH as a coach. There are 60 people under her supervision who are directly involved in rescue operations in events of avalanches and rockfalls (managing a notification system for residents, places of resettlement, providing assistance, logging frequency of occurrences per year to indicate places where resettlement occurs most often, etc.). Dilshodbegim and her colleagues commented on the significant role of AKDN in Khorog and in the region, demonstrated in recent infrastructure projects and possibilities provided for study, self-development and work.

The urban development of the city was discussed in the lack of connectivity between UCA and the city. Sulton, a university professor at UCA, stays at the university most of the time and does not go back to Tem often. Students from UCA do not visit the city centre much either.

Fig 21. Group session 2

Focus group 3

Focus group 3 discussed strategic opportunities for Khorog, the past trends of the Soviet era and critical challenges to urban resilience. Anjirbegim, the former mayor of Khorog stated that there is a unique relationship between the community and Khorog as the city is very small, meaning everyone knows each other but the city was also built by the community. The former mayor admitted the low quality of infrastructure and disaster resilient construction. She asserted that the critical challenge is the lack of technique and resilience knowledge. She also posited that the newly constructed high-rise buildings may not be optimal for the earthquake prone area.

Sultonazar, the former member of CoES confirmed the challenge adding that currently there are no appropriate state facilities to respond to natural disasters. Despite the fact that there is a considerable number of volunteers, trained by AKAH and equipment, there is a lack of official government support and emergency strategy in place for hazardous events. He suggested that the official recommendations combined with a clear plan of action for the event of emergencies would be an appropriate solution. He further stated that there is lack of special emergency storage places for goods, food, equipment, etc. in the city but there are many in GBAO. It would be strategically appropriate to consider locating some storage centres in Khorog.

The participants admitted that there are several challenges to business development. While small businesses seem to emerge quite actively (handcrafts, jewellery, clothing, etc.), it is difficult to develop a business further, due to institutional barriers. Amending those barriers could create an enabling environment for small and medium-sized businesses and there are several opportunities that such a process would unlock. Unique nature, magnificent landscapes and culture present great opportunities to activate touristic activities (hiking, fishing, etc.).

The culture of gathering specific herbs can be developed to generate larger local production profits for the city. However, it is critical to preserve and protect natural assets. The participants commented that the quality of the environment is slowly depreciating, the quality of water in the river is decreasing, and it is necessary to introduce environmental protection strategies and to change waste habits.

Other assets to leverage were identified in the creativity and the skills of the local population (such as handicrafts). It is important to pay attention to local skills and initiatives as they form the identity of the city, which, in turn, is attracting tourism. Zarina, a community volunteer, shared her experience in creating street furniture (street flower vase/flowerbed) made of local pinecones. She hoped that her work will one day be installed in Khorog for important celebrations.

Fig 22. Group session 3

7.5. WALKING AND TALKING SUMMARY

After the community engagement gathering, the project group visited a traditional Pamiri house to observe the traditional elements of design and construction. The local journalist explained the concept of spatial organisation according to the philosophy of Central Asia. Afterwards, the project group was divided into two to conduct visits to different Mahallas, meet with the local people and Mahalla chiefs.

Group 1

Visit to Andarsitez and Nivodak

Andarsitez:

- Andarsitez is one of the poorest neighbourhoods in Khorog, it has 280 households;
- The area is located far from the city centre and from any facilities or commercial areas. There is no kindergarden, no early childhood development centre, and no health facility in the vicinity;
- AKAH has recently built a new sports facility, which is the only public space in the area and is usually overcrowded. The sports facility is very busy after 5pm with older groups, and women playing volleyball.
- Children are sent to kindergartens and schools in other Mahallas;
- Public transport is not reliable and does not run on Sundays. Only one third of households own a car (approximately 100 households). The residents of this Mahalla commute to the city centre every day;
- Unemployment among women is very high. Despite the high level of education, job opportunities are very limited. Most people work in the botanical garden;
- Almost 50 houses are not connected to a water pipeline due to the distance from the main pipe. People take water from irrigation channels;
- There is no wet waste collection, waste is mostly thrown in the river. The residents rely on septic tanks;
- The area is at high risk of hazards, both of avalanches and rockfall. Approximately 27 households are at risk. There is already a cracked rock that looms above the area which people are afraid will fall. Residents have informed the authorities and are waiting for response or action. Some gardens (opposite botanical garden) were destroyed during the previous winter (2020) due to the avalanches;
- Knowledge on areas of risk and hazards is based on experiential communal knowledge, there is no official information;
- There is no dry waste collection nor rubbish bins in the Mahalla. Everything is thrown in the river.
- Mahalla chiefs collect money every month (10 somoni) and the community spend this collective money of those that may be in need;
- Youth like to come to the river to have picnics and go fishing;
- The Mahalla representatives would like to see an early childhood development centre, kindergarten, school, public space and a recreational area.

Nivodak:

- Nivodak is comprised of 120 households. Half of them have a car;
- There is no kindergarten, children go to an early childhood development centre until they start school;
- There is no health facility, residents have mae a request but the response was negative. The authority commented that the neighbourhood is not far from the general hospital;
- There is no public space and no sports facility. People need to go to the Ismaili Centre for gatherings;
- Public transport is operational, but not on Sundays. Public transport can be described as unreliable;
- Children and youth use bicycles, but parents don't allow children to cycle to the city centre due to road safety issues. Parents would allow this if there was proper infrastructure for cycling. There are no lights in the Mahalla, and a request was made to the mayor to address these issues;
- Unemployment is very high - approximately 30 per cent. There are no job opportunities in the Mahalla, and all must travel to the city centre. If there are no opportunities, residents collect stones for sale. A significant number of youth (approximately 100 people) from this Mahalla work in Russia;
- Unemployment among women is 50 per cent. Women who are able to work, work in the city centre - they make bread, handicrafts, Pamiri socks. There is currently a programme for older women to make handicrafts;
- In 2018, an avalanche destroyed two houses. The residents stayed in rental accommodation for four years after which they were given a new apartment in a 9-storey building. However, people are planning to repair their original

homes to use as summer houses;
- Residents were in their homes when the avalanche occurred, and were informed by volunteers. At 7pm in February, residents moved to the evacuation centre. Volunteers often go and inform residents in such events. There is a map provided by AKAH locating all evacuation centres. Communities are aware of the map and know where to access it;
- The school of the Mahalla is located in the hazard zone. The nearest medical centre is 5 km away;
- In the most recent hazardous event in 2019, a rockfall destroyed 1 house. River flooding occurs almost every summer;
- AKAH has built terracing to slow rockfalls and avalanches. This was completed in 2014;
- A lot of tourists come to visit the site because of its nature and landscape;
- There is no water pipeline network. There is a clean spring water, but it is not enough to supply all residents in the hot season (July/August);
- The community relies on septic tanks. There is no waste collection – waste is either burned or buried;
- There is no access to the riverfront;
- The Mahalla is very close to the Afghan border and the military patrols the area;
- The Mahalla representatives would like to see playgrounds and sports facilities, as well as a kindergarten.

Group 2

Visit to Khufak, Markazi, Dashti Poyon, Tem

- Water in Khufak/Markazi was redirected, impacting the natural seasonal flooding area and resulting in a loss of irrigation, production, forestation, safety from hazards, wildlife etc.;
- Before the water redirection, there were areas of walnut trees, which played a role in local economy and hazard mitigation;
- Currently there is no city-wide strategy for water supply;
- In these Mahallas there are no development limits in areas prone to hazards. People can rebuild damaged or destroyed properties on dangerous sites. For example, a new fuel station is being built just meters from the previous station that was destroyed.
- There is no provision of safety shelters;
- In these Mahallas there are several community measures of adaptation to rockfalls, such as ditches and nets.
- Houses in Dashti Poyon/Tem areas are constructed without any surrounding mitigation or adaptation measures such as terracing or forestation;
- Communities in these Mahallas are aware of hazards, however, there is no coordinated support from the government;
- The quality of water canals is very poor and there are multiple informal connections;
- The area of the bread factory presents an opportunity for the city as it is currently underdeveloped and located with the current urban network. Moreover, it has some existing infrastructure and facilities such as a bus terminal and adjacent commercial areas. The area is private, however, the title owner is interested in selling the right to use if an opportunity presents.

Fig 23. Urban agriculture in Khorog, May 2021

Fig 24. Pamiri house woodwork detail, May 2021

BOX 1: KEY EMERGING ISSUES

No coordinated support from the government

Currently there is no coordinated support from government in provision of health and education facilities, training programmes, cultural events, business support, or coordinated disaster mitigation strategies. There is political will, however, the community hopes that there will be more targeted and reponsive actions in future.

Unregulated urban growth

The city has grown in a chaotic manner. Some areas of the city are becoming challenging to access and regularise, such as the area of the central market. The area of UCA is disconnected from the city. Students or professors do not come to the city and stay on campus.

Sensitive issues and phycological support

Several topics are considered as very sensitive in Khorog. These include relocation and water meters. People living in the disaster-prone areas are concerned for their safety and feel uncomfortable with the lack of certainty about their future.

Lack of power/participation of the community leaders

Currently community leaders have no power in decision-making despite their influence in the community. Local government is often not aware of local initiatives, volunteers, etc.

Institutional barriers for business development

There is no possibility for small businesses to develop further due to institutional limitations and barriers put on private owners, such as administrative approvals and financial burden.

Emergency response facilities are not efficient

Currently there are no emergency storage centres in the city and no consolidated government strategy of action in case of an emergency.

Environmental degradation

The quality of the natural environment is decreasing, deforestation and unregulated waste are critical challenges. Waste is widely disposed of in natural water systems, generating to wide-spread pollution.

BOX 2: FURTHER RECOMMENDATIONS AND NEXT STEPS

Emphasising the need for support and coordination

It is important to place a stronger emphasis on the need for state support and coordination in multiple workstreams: hazard mitigation, business, culture, etc. It is important to provide evidence-based recommendations for government officials to ensure that next steps are clear and validated during the bilateral meetings and workshops.

Regularising urban development and growth

The pilot projects should demonstrate ways to regularise urban development through the application of UN-Habitat principles. Selection of the pilot projects should be made in consultation with local authorities and communities. Strategic recommendations should provide the government with clear actions to ensure the sustainable future development of Khorog.

Close consultation with communities

To ensure no one is left behind and human rights are respected, it is critical that strategic recommendations and targeted action plans are made in close consultation with the local communities. Such recommendations as relocation strategies should be implemented only in a participatory manner. Policy recommendations should include strategies to immediately increase public security and well-being.

Empowerment of community leaders

It is important to ensure close collaboration with community leaders as they have a great influence on the ground. Project recommendations and actions from community leaders can and should be tested.

Recommendations to create an enabling environment for business

It is important to ensure that critical opportunities for business development identified during the community engagement activities are enhanced. These include tourism, promotion of local culture (organisation of cultural events, festivals, etc.), local production such as herb cultivation, development of traditional medicine, fishing, etc. It is important to ensure that recommendations to soften requirements to expand/open small and medium-sized businesses are considered.

Comprehensive recommendations on emergency response facilities

The strategic recommendations should ensure a comprehensive approach to emergency response facilities. The strategies should include analysis of community practices in hazard mitigation and community needs identified, such as a comprehensive emergency action plan, strategic storage in Khorog, etc.

Recommendations to restore and protect the environment

It is critical that recommendations are focused on environmental protection and the introduction of nature-based solutions to ensure gradual environmental revitalisation. The recommendations should include the community feedback and comments, including positive past experiences.

Fig 25. The area of Tem

8

STEERING COMMITTEE

The Steering Committee meeting was designed to update the committee on the project process and intermediate outputs. The presentation included a brief summary of the project process and its positioning within the Khorog Urban Resilience Programme. The UN-Habitat presentation was conducted alongside other initiatives run by AKAH.

8.1. STEERING COMMITTEE OBJECTIVES

For purpose of programme management, information sharing, accountability and stakeholder participation the Khorog Urban Resilience Programme is to be guided by a steering committee comprised of key actors and stakeholders at the national, regional and local level. The Steering Committee has the following objectives:

1) Provide coordination and policy direction to the programme initiatives;
2) Ensure linkages with other programmes and initiatives in the region/country;
3) Lessons-sharing and management of the Programme;
4) Oversee implementation.

8.2. STEERING COMMITTEE LOGISTICS

The steering committee event formed part of the mission conducted by the project team to Tajikistan and was held on 27th May, 2021, in the Ismaili Centre, Khorog. The members of the committee and project teams from UN-Habitat and AKAH attended the event in person. The committee was headed and facilitated by the Governor of Khorog.

8.3. PARTICIPANTS

Name	Entity	Title
Yodgor Fayzov	Government of GBAO	Governor
Alisher Mirzonabot	Government of Khorog	Mayor of Khorog
Naim Mirakov	CoES GBAO	Head
Ulugbek Umarzoda	Committee of Architecture and Construction	First Deputy
Qozidavlat Qoimdodov	AKDN	Ambassador and Resident Representative
Ruslan Bobov	AKDN	Head of Aparatus
Hadi Husani	AKAH	CEO
Kishvar Abdulalishoev	AKF	CEO
Richard Chenevard	Swiss Cooperation Office Tajikistan	Deputy Head
Ruslan Sadykov	Swiss Cooperation Office Tajikistan	National Programme Officer
Dastanbui Mamadsaidov	UCA	Project Manger
Bohdan Krawchenko	UCA	Dean of Graduate School
Khurshed Burkhonov	Committee of Architecture and Construction	Head of Urban Planning Department
Qodirzoda Fayzullo	Government of Khorog	Deputy
Shaikhov Shaikh	Government of Khorog	Deputy
Oymuhammadzoda Ilhomjon	Hydromet	Hydromet under Committee of Environmental Protection
Dustzoda Dilovarsho Saidahmad	Geology	Head of Main Depatment of Geology
Riozoda Nurali	LDC	Deputy Head of Local Development Committee
Malika Giles	AKAH	Program Manager
Mamadnazar Mamadnazarov	AKAH	Head of Habitat Improvement Department
Tohir Sabzaliev	AKAH	Head of GIS unit
Rukhshona Makhsudinova	AKAH	Urban Planner
Masrur Migharibov	AKAH	Capacity Building Officer
Navruzsho Afzalshoev	AKAH	Capacity Building Officer
Herman Pienaar	UN-Habitat	Head of the Urban Planning and Design Lab
Pinar Caglin	UN-Habitat	Project Lead
Anastasia Ignatova	UN-Habitat	Urban Planning and Design expert
Maia Smillie	UN-Habitat	Urban Planning and Design expert
Ban Edilbi	UN-Habitat	Urban Resilience expert Urban Resilience expert
Mario Tavera	UN-Habitat	Planning and GIS expert
Anna Kvashuk	UN-Habitat	Urban Legislation and Governance expert
Zafar Avzalshoev	UN-Habitat	Local Urban Infrastructure and Planning expert

Table 9. Steering Committee meeting participants

8.4. STEERING COMMITTEE SUMMARY

During the event, the UN-Habitat project team presented the key challenges for the city and strategic recommendations based on comprehensive analysis. The presentation included key points articulated in the diagnosis workshop.

Key presentation points:

As per section 7.4 of the current report.

Reactions to the Presentation:

The presentation was well received by the members of the steering committee. The members of the Committee of Architecture and Construction commented that an urban restriction boundary is a sensitive solution, and it is important to look closely into this response to determine whether it can be applicable countrywide. It was stated that if proposing growth restriction and "zero development" in the hazard-prone areas, it is crucial to propose alternative options for settlement. In response to that, UN-Habitat stated that this type of recommendation is possible only when using a participatory approach under the key principle to "leave no one behind". It is necessary to ensure that the communities are aware of each recommendation and actively participate in the planning process. To enhance participation, it is critical to conduct the presentation on recommendations to the Mahalla chiefs and promote their empowerment.

A further comment from the members of the Committee of Architecture and Construction was regarding the regeneration of under-developed areas. The committee members referred to the 240ha project of city-extension in Tem. In response to that, UN-Habitat explained that this project was not considered in the recommendations as it does not follow the principles of sustainable development promoted by UN-Habitat. It is believed that this type of development can lead to urban sprawl, with ecological and cost implications. UN-Habitat stated that underdeveloped areas in Khorog are a valuable resource, which can assist in accommodating a growing population without expansion. Exclusive use title ownership can addressed in the economic model and public-private-partnerships strategy which is to be provided at the next stage of the project. The committee members commented that it is important to consider the population forecast in the presentation. UN-Habitat stated that the population forecast had been developed and will be provided in the final version of the document.

A comment was made regarding river access as according to the current legislation, construction is forbidden close to the river edge. This will be addressed by creating several access points to the river, rather than redesigning of the actual riverbank. This suggestion was supported by the committee members.

In a discussion of infrastructure, it was agreed by the members of the Steering Committee that it is important to build 'synergies' across action plans. For example, AKAH is providing a water channel from UCA to the city centre but it is important to consider avalanche terracing, pathways, etc., simultaneously. It It was agreed that it is important to consider network revitalisation to respond to irrigation failures. If the existing canals/channels are improved to eliminate leaks and bloakcages, they can still be of effective use. It was agreed that new irrigation and drinking water supply is also crucial, as is maintenance. Finances must be spent efficiently spent integrated with all utility services expenditure.

In conclusion, it was agreed that collaboration among all stakeholders is necessary whilst accounting for regional dynamics, employment and security.

Fig 26. UN-Habitat team presenting at the steering committee meeting

Fig 27. UN-Habitat team presenting at the steering committee meeting

BOX 1: KEY EMERGING ISSUES

Sensitivity regarding growth restriction boundary

As many houses have already been built in hazard-prone areas, the recommendation for a growth restriction boundary will be challenging to implement. There is no currently no alternative solution to potential relocation.

Unsustainable development pattern

The project in Tem has been mentioned during multiple events. However, the project does not align with the principles of sustainable development.

Exclusive use title ownership of underdeveloped areas

Due to the fact that some (selected) underdeveloped areas are under title for exclusive private use, potential development may prove challenging.

Riverbank design

Current legislation prohibits all construction from taking place on the area close to the river edge. The majority of the bank area is developed and private.

Regional perspective

A high unemployment rate and security concerns are important to take into account as they may affect population and migration trends.

BOX 2: FURTHER RECOMMENDATIONS AND NEXT STEPS

Providing alternative solutions

It is important to ensure that the report provides alternative solutions for relocation. The project team selected a set of underdeveloped areas for future regeneration and introduction of new housing typologies. The selected areas could accommodate 4,000 people, which is more than the population figure currenly residing in hazard-prone areas. The precise action plan, infill strategy and population scenario is to be developed in the final report.

Enhanced participatory approach

As many houses have been built in hazard-prone areas, it is important to ensure that these communities play an active role in decision-making regarding their resettlement. Further consultations and participatory events with communities (Mahalla) are required. The recommendation will be challenging to implement, however, there is currently no alternative solution to potential relocation.

Regeneration of underdeveloped areas

To address the issue of urban sprawl it is crucial that the principles of sustainable development are promoted by all the stakeholders/partners. The set of pilot projects will showcase these principles and their application in practice.

Development of access points to the river

The detailed action plans will include proposed access points to the riverbank to promote interaction with the river. The access points can be connected within the urban area to ensure continuity of pedestrian routes.

Challenges at the regional scale

The report addresses critical challenges and opportunities at the regional scale. The impact of the project on regional development patterns will be evaluated.

Fig 28. House under construction in the area at risk , May 2021

9

WORKING SESSION WITH AKAH EXPERTS

On the 10th of August, the UN-Habitat project team conducted one of the conclusory working sessions with the AKAH technical experts to ensure the formulated recommendations and proposed actions are well received and validated. The UN-Habitat team presented a summary of strategic recommendations, estimated scenarios showing the impact of land use diversification and redevelopment and strategic densification within the selected nodes.

Key presentation points

- Based on the strategic recommendations, the team identified 8 strategies to be applied:
  - Growth Management Strategy
  - Natural & Cultural Conservation Strategy
  - Basic Service Provision Strategy
  - Urban Regeneration Strategy
  - Hazard Mitigation Strategy
  - Agricultural & Food Supply Strategy
  - Adequate Housing & Relocation Strategy
  - Resilient Streets Strategy
- According to the comprehensive action table, several mahallas with a more diverse set of actions were identified such as Andarsitez, Dashti Poyon, Kichordev, Khorugi Bolo, Tabobatkhona;
- There are 5 strategic nodes which are identified within the city. Within these nodes strategic densification and land use diversification are proposed;
- The applied density for the selected nodes is 125 people per hectare, which is the highest in Khorog and relevant to the central area, characterized by the most efficient land use pattern;
- The scenario on population shows that the five strategic densification nodes can accommodate nearly 14,000 people, which is 45.5% of the current population. The total population will become 44,443 people;
- The current land use pattern is represented mainly by monofunctional development with eventual commercial clusters;
- The proposed land use pattern can generate 19,000 jobs in total. Considering the estimated future population around 44,443 people, the proposal can produce employment for 42.7% of the total population;
- The proposed land use pattern generates 24,662 jobs in total. Considering the estimated future population around 44,443 people, the proposal can produce employment for 55.5% of the total population;
- Legislation should be adjusted to include of the norms that oblige the measurement of greenhouse gases, including necessarily from the assessment when conducting urban planning;
- Legislation should ensure contextual linking of green spaces to carbon sinks as well as enshrining recommendation of 9 m2 per person in terms of the size of green spaces;
- Development of bylaws and technical documentation with consideration of energy saving issues in urban planning should be in place;
- It is important to ensure the Inclusion of funding for climate change mitigation and adaption in urban planning at the legislative level;
- It is important to ensure the upgrading the role of local governments by implementation of climate change issues, first at the national level, and later at the regional level;

Key Discussion points:

- It is critical to have a feedback from the AKAH team at the stage of development of the comprehensive action table which specifies a certain action per mahalla;
- AKAH team commented that it is important to understand which Mahalla has an action and which has a project, it is important to show that differentiation and priority actions/projects;
- The project team stated that each action requires the development of the project. At the current stage, prioritisation is challenging as the clear criteria should be defined; Action indicates what has to be done in the city to achieve the six strategic recommendations in response to sic identified challenges; The prioritisation of actions and detailed projects per action is not within the scope of the phase I;
- The table shows only the physical actions which are needed in each mahalla. The recommendations related to policies, legal and institutional frameworks, community programmes are specified in the beginning of the city profile part 3 on the strategic recommendations;
- The prioritisation exercise should be done within the scope of phase I in a participatory manner, involving the mahalla leaders;
- It might be useful during the further stages of the project to include the analysis of the citywide impact – which action impacts which areas;
- One of the objectives of this table is to define the areas which require a more attention since they concentrate a bigger number of actions which have a city-wide impact; It does not mean that other mahallas which are not covered by the actions are not important and require interventions, it means that the identified mahallas should be developed in detail to comprehensively demonstrate how the city challenges can be addressed;
- It is important to ensure that the current actions are aligned with the ongoing study being conducted by AKAH on the hazard mitigation measures. After the study, the mitigation list will be shared with the project team;
- It is important to insure how the identified actions can be translated into the town plan; It was stated that each action requires a further project development before implementation;
- Some of the proposed nodes are developed and it might seem that infill strategy is challenging to implement. The scenarios suggest that in this case the land use diversification should be applied and increase of storeys;
- The challenge of private ownership was discussed, and it was stated that the ownership will be addressed at the further stage of the project by showing the attractiveness of selected areas for investments, developing the CIP and conducting a set of participatory consultations involving landowners and local authorities;
- It is important to understand that the project is proposing to change the urban formation rather that promoting a new construction from scratch everywhere;
- For the future scenarios the project does not indicate any year on purpose to emphasise that with appropriate strategies within the selected regeneration nodes the city can accommodate the growing population;
- In order to include the considerations on migration, it is critical to have more information on the government perception, migration policies and situational updates from the field;
- The project team will provide a checklist for the integration climate change into the regulatory framework at the national level; However, the checklist can be applied to the city level;
- All the comments and feedback from both technical and management teams should be sent to the project team.

10

KNOWKEDGE SHARING SESSION WITH SECO EXPERTS

On the 26th of August the project team conducted the online conclusory knowledge sharing session with the SECO technical experts and presented the strategic recommendations, action plan, future scenarios and urban design urban design interventions. The project team updated SECO experts on the progress of the project and future activities. The team presented the detailed content of the "City Profile Part 3 Recommendations". The SECO experts presented the methodology for Integrated Risk Management and Resilience Building and overview of the planning practice in Switzerland.

The key objective of the session was to share knowledge on the planning process in Khorog and similar contexts with an emphasis on hazard mitigation and risk. During the session the project team collected the feedback from SECO experts to be integrated in the further stages of the project. In addition to technical inputs, UN-Habitat team aimed to strengthen the collaboration with SECO experts to ensure consultative nature of work during the further stages of the project.

Key presentation points:

Key presentation points from UN-Habitat as per section 10 of the current report

- 4 major steps to follow: 1) Asses the hazard according the 3 criteria (type or process of hazard, area affected by process, probability / magnitude of process), 2) Assess exposure, vulnerability , 3) Evaluate and weigh risks (with the involvement of the communities, local authorities, etc.), 4) Manage and reduce risk (based on hazard maps prevent the new risks or insure the risk informed urban planning), 5) Manage -perform cost-benefit analysis to find best measures, 6) Create resilience for the system through the 4 R (Robustness, Redundancy, Resourcefulness, Rapidity), 7) Measure effectiveness of all input to demonstrate effectiveness of DRR / Resilience Building.
- Risk Informed Development Planning implies the conduction of the comprehensive data base (Swiss Example on Data Sharing). Hazard Maps should be translated into Development Planning with binding obligations for land owners, controlled by authorities at municipal level.
- The major planning principles applied during the planning processes in Switzerland be defined as follows:
- Subsidiarity, which means that spatial planning is done on all political and administrative levels;
- Cooperation, which means that authorities on all levels and private persons, organisations, companies have to co-operate both vertically and horizontally;
- Top-Down and Bottom-Up approaches, meaning that the spatial planning is done in both directions and strong coordination is therefore required;
- The planning process in Switzerland covers all scales, including the federal one which should follow the Concept of Federal Spatial Planning. The concept considers that areas of Metropolitan spaces, Capital region, Small and medium city spaces and Alpine spaces of action.
- The Spatial Planning Concept focuses on strengthening cooperation in functional spaces, promoting partnerships between metropolitan space, promoting partnerships between cities and agglomerations, interlink rural centers and alpine tourism centers with cities, promoting a better use of border situation.

- The Spatial Planning Concept should ensure the balance among different landscape types: City landscape, Urban residential landscape, Cultural and natural landscapes, etc.
- Apart from c Spatial Planning Concept, each Canton (Swiss administrative division) has a guiding plan which directs the overall spatial development and considers Settlement development, Landscape development, Transportation networks and infrastructures, Infrastructures (energy, water, wastewater, waste treatment), Public buildings (schools, hospitals, governmental).
- The Spatial Planning Concept is translated into the Municipal Land Use Zoning Plan;
- From the urban design perceptive, there are several key urban design principles which have been followed countrywide. Apart from creating a comfortable urban environment, thee principles strengthen the local identity, so called "Swissness". These principles are: creation of small-scale mix of uses, providing a variety of building sizes and typology, ensuring a harmonious mix of "traditional" and "modern" typologies, providing a high-quality environment and prioritising local building materials.

Key Discussion points:

- Apart from focusing on spatial development, the component on hazard analysis can use qualitative or quantitative assessment, for example, financial risks in case of a hazard (value of infrastructure at risk). That can be done during the further stage of the project (during the development of CIP) with the support of local partner in data collection;
- The project might consider multiple scenarios for political decisions; however, the project team aims to ensure that the final reports include direct and punctual actions;
- The analysis on Integrated riverbed erosion may include a wider assessment taking into account the whole catchment to understand the level of water, the return period etc. to ensure that projects consider extent of impact and contribute to building synergies rather than being concentrated on too specific issue. The current recommendations provide a comprehensive direction for partners through the action plan, aimed to accelerate the transformation of the city in an integrated manner;
- The consideration on migration patterns from Khorog int the region and formation of smaller satellite settlements may be included based on the assumption that the population will continue grow. Such scenario may be proposed in the frame of larger researches countrywide which analyse the settlement patterns and national migration trends. The current recommendations aim to provide punctual plan of action at the city scale;
- From the urban design perspective, it is suggested to explore the introduction of municipal; parking concepts since the cars will stay in the city. The alternatives for parking should be investigated further.

Fig 29. UN-Habitat presenting strategic recommendations to the Governor of GBAO and his team

11

THE WAY FORWARD

The participatory events opened discussions on steps to be explored and elaborated further. After each session (workshop, working session, community engagement event, etc.), the analysis was actualised to include the new findings. Under the overarching critical challenges related to urban, socio-economic and environmental resilience, each session emphasised several key issues related to participation, which were as follows:

- Due to the sensitivity of several recommendations, community participation in the planning process is essential to ensure that people are aware of any intervention;
- It is important to increase awareness among government officials about the existing community mitigation strategies and volunteer projects to showcase best practices already being implemented in Khorog;
- Local communities, volunteer organisations and Mahalla chiefs require more governmental support. Mahalla chiefs need empowerment in decision-making processes and active participation in planning as they play an important role in the communities;
- Some interventions require close collaboration with local business owners and the private sector, organising open dialogues with the government officials. As potential areas for future interventions are restricted to private rights of use, it is important to ensure that an enabling environment for investment is in place, which can activate private-public-partnerships;
- The project team will ensure that the points raised and discussed will be emphasised during the next stages of the programme, with further community engagement events involving national, regional and local authorities to ensure dialogue between citizens and the government. To foster the integration of participatory approaches in decision-making, technical training sessions were conducted to demonstrate the necessity of community participation.

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Был ли представлен достаточный уровень информации для понимания основных трендов города?	нет	частично	да
Если нет, то что было упущено? _____			
Были ли особо критические моменты, которые были не учтены в презентации?	нет	частично	да
Если да, то какие? _____			
Узнали ли вы что-то новое?	нет	частично	да
Если да, то что? _____			
Считаете ли Вы такой формат презентации полезным для понимания города?	нет	частично	да
Будет ли Комплексный план по обеспечению устойчивости полезен для Вас?	нет	частично	да
Если да, то как?_____			

12.4.MAP DEVELOPED DURING THE RAPID PLANNING STUDIO

Integrated Spatial Plan for Environmental and Socio-Economic Resilience

KHOROG
Tajikistan

Legal Assessment using UN-Habitat Law & Climate Change Toolkit

September 2021

UN-HABITAT
FOR A BETTER URBAN FUTURE

Aga Khan Agency for Habitat

Habitat Planning
A Programme of the Aga Khan Agency for Habitat

RESILIENT KHOROG 2035

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience
Khorog, Tajikistan

Legal Assessment using UN-Habitat Law
& Climate Change Toolkit

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UN-HABITAT FOR A BETTER URBAN FUTURE

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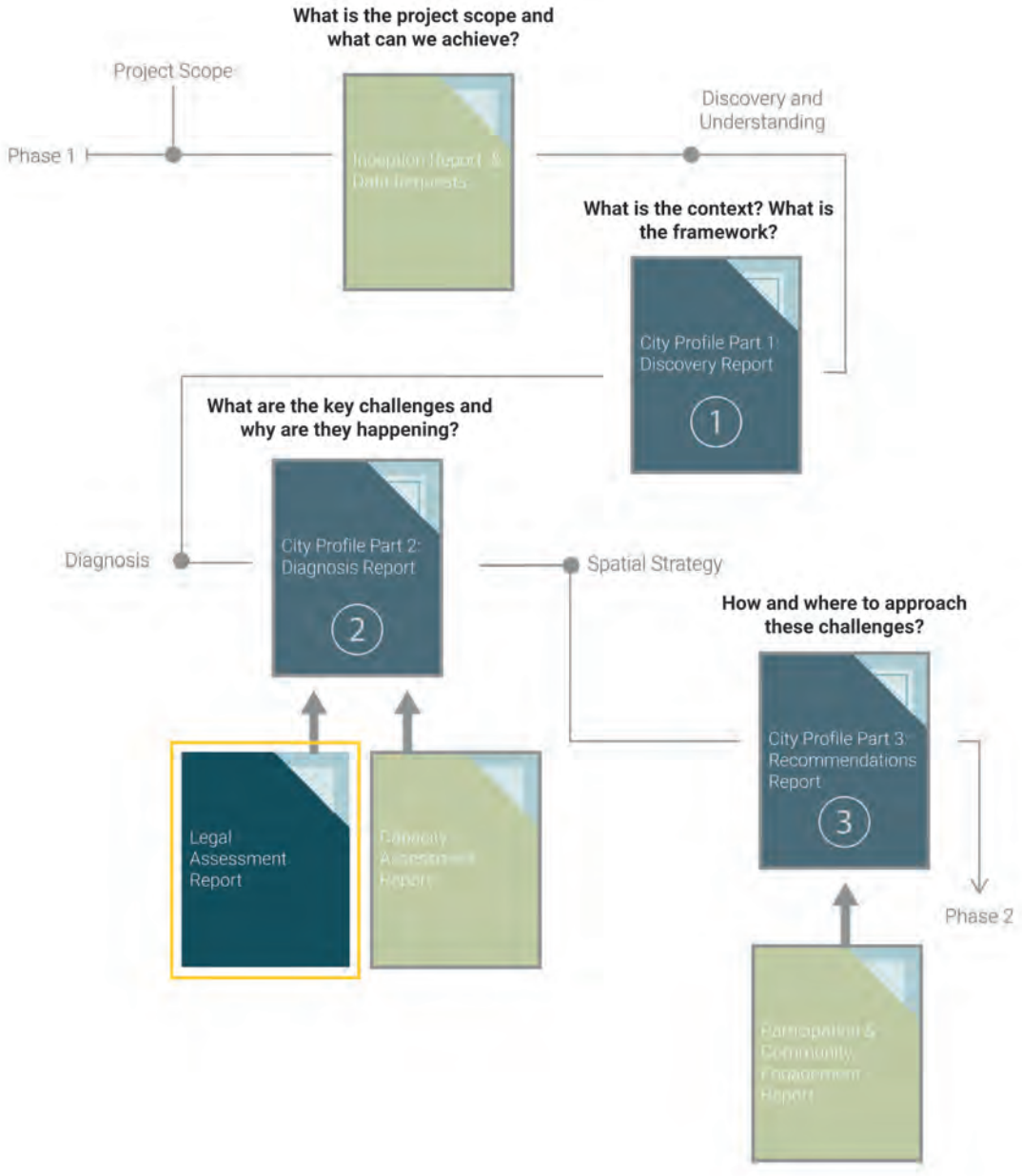
RESILIENT KHOROG 2035

Habitat Planning

Integrated Spatial Plan for Environmental
and Socio-Economic Resilience

Legal Assessment using UN-Habitat Law & Climate Change Toolkit



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ACRONYMS

CAC	Committee for Architecture and Construction
CC	Climate Change
CEP	Committee for Environmental Protection
CIFs	Climate Investment Funds
CTF	Clean Technology Fund
EA	Environmental Assessment
EIA	Environmental Impact Assessment
FIP	Forest Investment Programme
GBAO	Gorno-Badakhshan Autonomous Region (Oblast)
GHG	Greenhouse gas
GOST	technical standards
GoT	Government of Tajikistan
Hydromet	State Agency for Hydrometeorology
INDC	Intended Nationally Determined Contribution
LCCT	UN-Habitat Law and Climate Change Toolkit
MEDT	Ministry of Economic Development and Trade
MEWR	Ministry of Energy and Water Resources
NAP	National Adaptation Plan
NAPCC	National Action Plan for Climate Change Mitigation
NC	National Communication of the UNFCCC
NCCAS	National Climate Change Adaptation Strategy
PPCR	Pilot Programme for Climate Resilience
PPP	Public-Private Partnership
SNIP	building standards
SREP	Programme for Scaling up Renewable Energy in Low Income Countries
UNFCCC	United Nations Framework Convention on Climate Change
UP	Urban Planning
USSR	Union of Soviet Socialist Republics
SEA	Strategic Environmental Assessment
SEE	State Environmental Expertise
SCF	Strategic Climate Fund
TPC	Town Planning Code

Fig 1. Development on a slope in Nivodak, May 2021

Fig 2. View on the city of Khorog, May 2021

1

INTRODUCTION

Climate change presents a significant challenge for urban systems worldwide. The environmental changes that humanity faces are deeply intertwined with complex urbanisation processes[1], which together constitute the defining megatrends of our time. More than half of the global population today lives in urban areas and urbanisation projections indicate that this trend is set to continue over the next decades.[2] Environmental challenges and urbanisation are interrelated in at least two ways; firstly, a significant amount of energy and greenhouse gasses are expended in urban areas. By designing, building, and operating urban areas in an energy efficient way, significant decreases in greenhouse gas emissions can be achieved. Secondly, rapidly growing urban populations are forced increasingly onto marginal land, thereby raising the likelihood that they will be negatively impacted by climate change, through increased severe weather events, and flooding.[3] Urban design thereby impacts and is impacted by climate change, and it is increasingly important that mitigation and adaptation are built into planning strategies to accommodate future growth.

At present, nowhere in Central Asia does climate change concern as a multiplier of insecurity rise to the level of alarm, but conditions in mountainous and densely populated areas and the southern borders of Central Asia warrant ongoing attention.[4] Tajikistan is a small, landlocked country which lies at the heart of Central Asia, bordering Afghanistan, China, the Kyrgyz Republic, and Uzbekistan. Roughly one-tenth of the 7 million total population lives in the capital city of Dushanbe. The country is blessed with abundant water resources, which has proved important to the country's prominent cotton industry and aluminium production, the latter of which constitutes approximately 50 per cent of national exports. These industries are supported by abundant and inexpensive electricity supply, generated by hydropower. However, unlike other richer Central Asian countries (e.g. Kazakhstan, Turkmenistan), Tajikistan has negligible reserves of natural resources such as oil and gas. Only 7 per cent of the total land area in the country (143,000 square kilometres) is arable. High mountain ranges across the territory occupy a large amount of land and make communication and movement difficult, especially in winter. Tajikistan is highly susceptible to natural disasters, and is regularly affected by floods, landslides, earthquakes, and droughts.[5] It is highly vulnerable to the adverse impacts of global climate change, as it already suffers from low agricultural productivity, water stress, and high losses from disasters.[6] Tajikistan's vulnerability results from a composite of the main problematic themes seen across the region at large – the impacts of climate change and extreme weather events in mountainous and densely populated areas and cross-border tensions related to water resources and energy development, all further complicated by poverty. The southern regions of the country are particularly susceptible to climate change and extreme weather conditions. Despite these challenges, Tajikistan has become a pioneer in incorporating climate change considerations into economic planning, linking investments to long-term climate predictions in recognition of the connections between climate resiliency and economic security.[7]

1. p.1 of the Climate Change Impacts on Urban Planning in Cities by H. Shalaby and S. Aboelnaga.
2. p.7 of the Climate Change and National Urban Policies in Asia and The Pacific. A Regional Guide for Integrating Climate Chnage Concerns into Urban-Related Policy, Legislative, Financial and Institutional Frameworks, 2018.
3. p.6 of the Climate and Urban Development. WMO-No.844, Geneva, Switzerland, 1996.
4. p.10 of the Regional Assessment. Climate Change and Security in Central Asia. The Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan and the Republic of Uzbekistan.
5.p.1 of the Tajikistan: Key Priorities for Climate Change Adaptation by Luca Barbone, Anna Reva and Salman Zaidi, 2010.
6. p.1 of the Tajikistan: Economic and Distributional Impact of Climate Change by Rasmus Heltberg, Anna Reva, and Salman Zaidi, 2012.
7. p.11 of the Regional Assessment. Climate Change and Security in Central Asia. The Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan and the Republic of Uzbekistan.

Climate change requires specific consideration in urban planning. In this document, we will consider and analyse this relationship using the Law and Climate Change Toolkit is an online and open database aimed to provide a global resource to help countries put in place the legal frameworks necessary for effective domestic implementation of the Paris Agreement and their nationally determined contributions (NDCs). Its Urban Law Module was developed by UN-Habitat to guide analysis of urban legal frameworks with respect to climate action, and is composed of five fundamental analytical areas which form the chapter structure of this document: governance and institutional arrangement; planning instruments; planning for adaptation; planning for mitigation; economic and financial instruments sections.[8] Each analytical section will be supplemented by recommendations for further legislation development and checklists based on the LCCT analysis to track presence or absence of specific legislative norms.

8. The Law and Climate Change Toolkit. An Innovative Tool to Support the Implementation of the Paris Agreement.

Fig 3. Commercial area in the central part of Khorog, May 2021

2

GOVERNANCE AND INSTITUTIONAL ARRANGEMENT

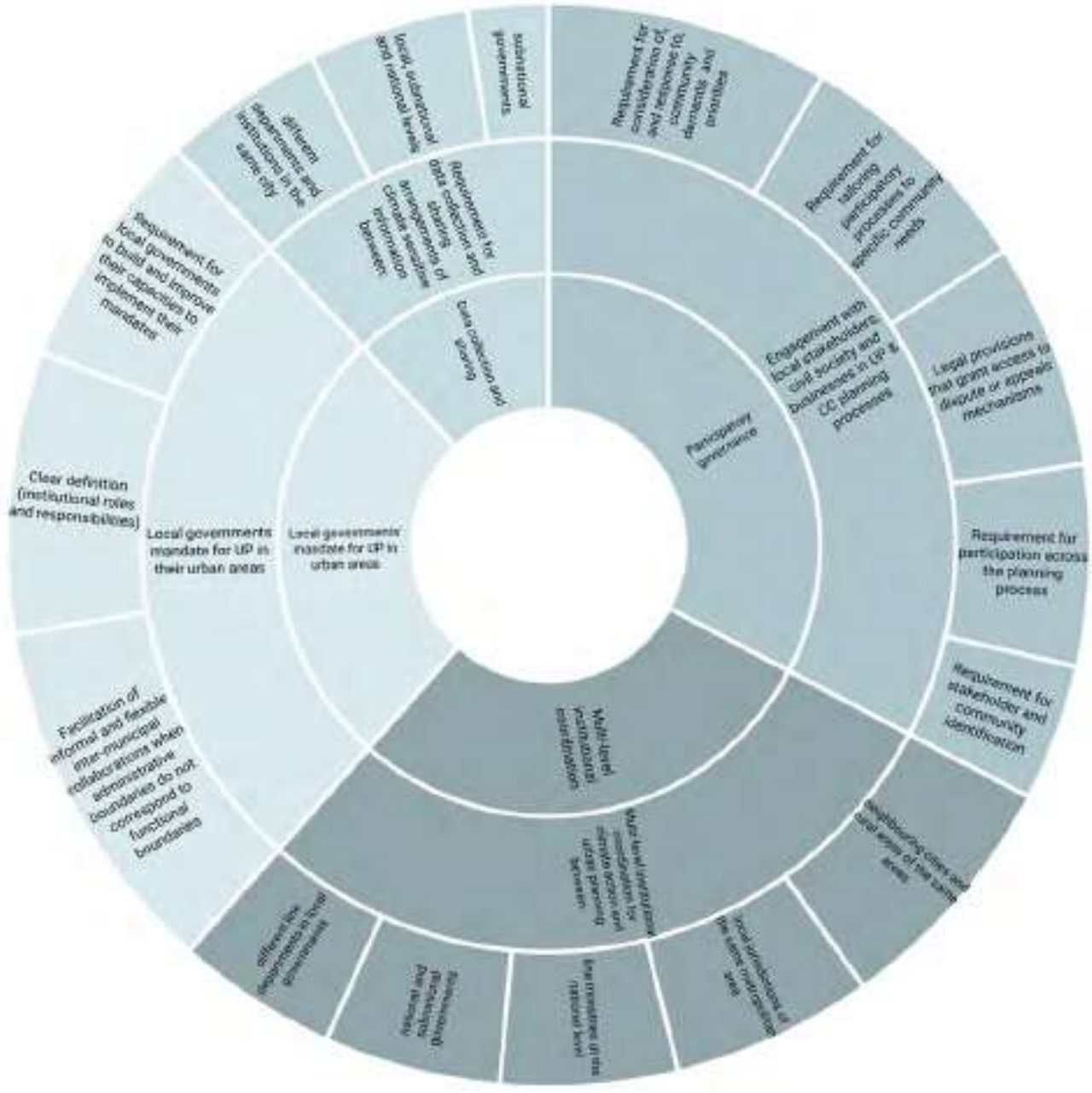


Fig 4. Governance and Institutional Arrangement diagram

Before proceeding to the legislative analysis of the Republic of Tajikistan using the LCCT, it is necessary to acknowledge the underlying state structure. Tajikistan is a unitary state which declared its independence on September 09, 1991, and approved its Constitution on November 06, 1994.[1] The constitution enshrined a presidential form of governance with three branches of state power, namely: **legislative** (Parliament), **executive** (Office of the President and the Government) and **judicial.** The President and the government are considered as the **National (Republic) level.**

The **Sub-National level** in Tajikistan, is composed of **"local bodies of state power (or authority)" (Khukumats) and local self-government (Jamoats)**. Khukumats, although often referred to in English as "local governments"[2], are a hybrid form of government. Their predominant nature is that of deconcentrated offices of the central ministries, with a centrally appointed executive and technical staff subject to dual subordination under the appointed executive and their home ministry. Central control is extended through the budget process and structure. However, these institutions do have an elected council, assigned functions and are able to collect own and fees which is what leads to their characterization as "local governments". The structure of governmental relations is illustrated in figure 5. The powers of each legislative branch are outlined in the following section.

The legislative branch

The Republic of Tajikistan possesses a bicameral Parliament, composed of a lower house, **the Majlisi Namoyandagon (Assembly of Representatives)**, and an upper house **the Majlisi Milli (National Assembly)**. The Assembly of Representatives acts on a permanent and professional basis, and the National Assembly is convened at least four times per year.

The Assembly of Representatives has the authority to establish the Central Commission on Elections and Referendums, elect and recall the chairperson, vice-chairperson and members of the Commission at the recommendation of the President, submit bills and other important state and social issues for public discussion, approve social and economic programmes, approve the issue and receipt of State credit, ratify and denounce international agreements, establish courts, etc. Out of 63 deputies that compose the Majlisi

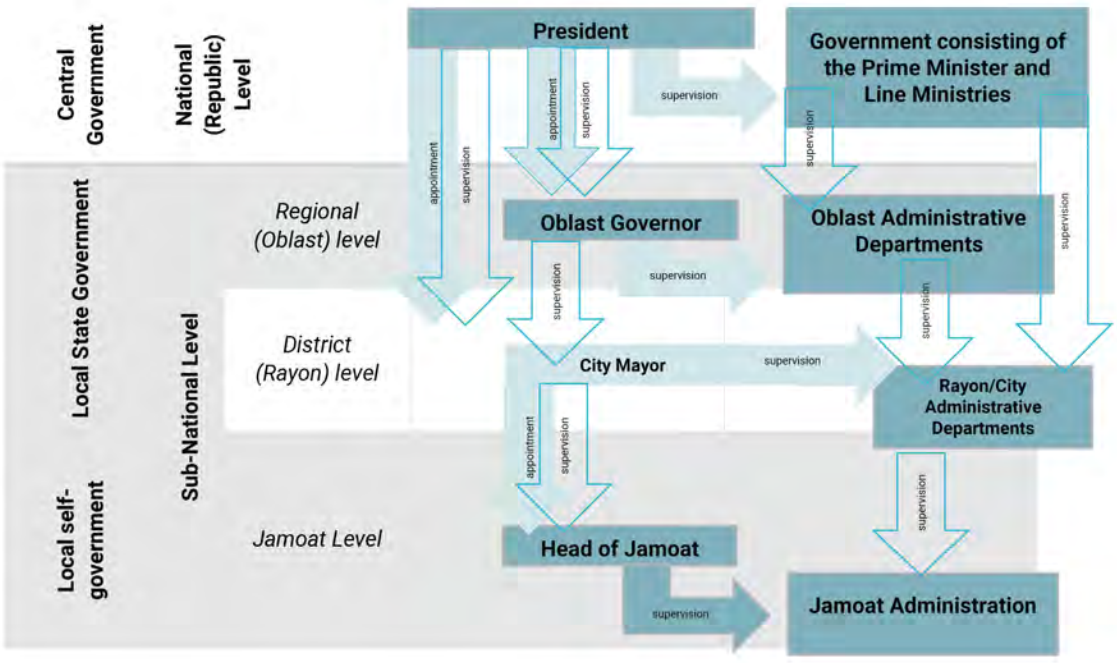


Fig 5. Governmental structures

9. p.5 of the Chapter 11. Local Government in Tajikistan by Mamadsho Ilolov & Mirodasen Khudoiyev.

10. p.16 of the Local Governance and Citizen Participation Programme in Tajikistan. Tajikistan: Sub-National Government Assessment of 2009 by Francis Conway.

Namoyandagon, 41 are elected by direct electoral districts and 22 by party lists. The powers of deputies and members of parliament are limited to 5 years.[11]

According to Article 20 of the Regulation of the Majlisi Namoyandagon of the Republic of Tajikistan[12], the Assembly consists of the following committees and commissions:

- Committee on Economy, Budget, Finance and Taxes;
- Committee on Constitutional Legality, Legislation and Human Rights;
- Committee on Law Enforcement, Defence and Security;
- Committee on Agrarian Issues and Employment of the Population;
- Committee on International Affairs, Public Associations and Information;
- Committee for Science, Education, Culture and Youth Policy;
- Committee on Social Affairs, Family, Health and Environment;
- Committee for State Building and Local Self-Government;
- Committee for Energy, Industry, Construction and Communications;
- Parliamentary Ethics Commission;
- Commission for Control over the Rules and Organisation of work.

The National Assembly is responsible for education issues; dissolution and modification of administrative and territorial units; election and recall of chairperson, vice-chairperson and judges of the Constitutional Court, the Supreme Court and the Higher Economic Court of Tajikistan at the request of the President, and decisions on the revocation of their immunity; and the appointment and dismissal of the Procurator General of Tajikistan and of his deputies. It is comprised of 33 members, 25 of which are elected by secret ballot directly at joint meetings of the people's representatives of GBAO and its cities and districts, regions and their cities and districts, the city of Dushanbe and its districts, cities and districts of republican subordination. The President of the Republic of Tajikistan elects 8 representatives of the Majlisi Milli. Each administrative entity, regardless of its size and number, occupies 5 seats in the Majlisi Milli. According to the Constitution, every former President of the Republic of Tajikistan is a member of the Majlisi Milli for life, if she or he does not renounce this right. Through this affordance, the state wishes to recognise the merits of the head of state and make further use of her/his experience.[13]

According to the Resolution of the Majlisi Milli No.9 dated April 17, 2000, the Assembly contains the following committees and commission:

- Committee for Economics and Communication;
- Committee for the provision of Constitutional Foundations, Human Rights and Freedoms, Citizenship and Legality;
- Committee on Agrarian Issues, Employment and Environment;
- Committee on Social Affairs, Health, Science, Education, Culture and Politics among Youth and Women in Society;
- Committee for Coordination of Activities of the Majlisi Milli with the Majlisi Namoyandagon, executive power, public associations, mass media and inter-parliamentary relations;
- Commission for Control over the Rules of Procedure and Ethics of Members of the Majlisi Milli.[14]

Legislative initiative belongs to the members of both chambers and the president, government, and Majlis of People's Deputies of GBAO.

The judiciary branch

In Tajikistan, judicial authority is exercised by the Constitutional Court (consisting of seven judges), the Supreme Court, which is the highest judicial body in civil, criminal, and administrative proceedings, the Higher Economic Court, military tribunals, the court of GBAO, regional courts, the Dushanbe municipal court, city and district courts, the economic court of GBAO, and the economic courts of the region and of the city of Dushanbe. The establishment of extraordinary courts, such as those tied to the resolution of specific issues in urban planning, is prohibited.[15] Thus, in the occurrence of violations to urban planning legislation, individuals and legal entities can apply to the district court with a claim for compensation on the basis of harm caused to the life, health, and property of citizens or the property of legal entities and public associations.

11. Description of Parliament in Tajikistan.
12. Regulation of the Majlisi Namoyandagon of the Republic of Tajikistan dated 2002. Available here.
13. Description of Parliament in Tajikistan.
14. Resolution of the Majlisi Milli of the Majlisi Oli of the Republic of Tajikistan of April 17, 2000, No.9 "On the formation of committees and commissions of the Majlisi Milli of the Majlisi Oli of the Republic of Tajikistan".

The executive branch

In accordance with the Constitution, constitutional acts, and laws of Tajikistan, the bodies of executive power are the Government of Tajikistan and the ministries, state committees, departments, and local authorities (khukumats) subordinate to it. Local authority is exercised by the chairperson of the region, city, and district as representative of the President. In settlements and villages, jamoats are embued with the executive power of local self-governing bodies.

The national Government of Tajikistan (GoT) comprises the Prime Minister, his first deputy, and the deputies, ministers, and chairpersons of state committees. The Prime Minister and other members of the government are appointed and dismissed by the President and their appointment is approved at a joint meeting of the National Assembly and the Assembly of Representatives. The GoT functions for the duration of the President's term of office.

The GoT, in accordance with the Constitution, constitutional acts, and the law of Tajikistan, issues decisions and orders on which implementation is compulsory throughout the territory. The GoT participates in the implementation of domestic and foreign policy, provides effective guidance in the social, economic and cultural spheres, provides guidance within the system of government bodies, prepares and implements state targeted programmes, and has the right to introduce legislation.[16]

Local bodies of state power (khukumats)

Article 6 of the Constitution stipulates the functions of local government institutions and establishes norms for the division of power at the local government level. Major local council powers include approving local budgets and reviewing budget execution reports, determining the direction of social and economic development within the territory, setting local taxes and fees, and managing communal property.

The heads of the regional, city or district state administration (khukumat) simultaneously wield executive authority and act as local council chairpersons. These heads are appointed and dismissed by the president and presented to their respective councils for approval. Each oblast, raion and city has its own khukumat. Consequently, there are three oblast khukumats and one Dushanbe khukumat; fifty-eight khukumats of rural raions; sixteen khukumats of oblast and raion cities; and four Dushanbe city district khukumats.[17]

Local self-government (Jamoat)

According to the Constitution, a Jamoat is an institution of local self-government in towns and villages. The framework for their authority is set forth in the Law on Local Self-government in Towns and Villages.[18] This law describes local self-governance as "the system of organising public activities to address issues of local importance autonomously and at their own discretion, directly or indirectly, in accordance with the legislation of Republic of Tajikistan. Local self-governments resolve issues within their competence directly or through their representatives." Jamoats are formed on a territorial basis and possess legal status and an official seal. Community property that these entities are imbued with the power to manage may include means of transportation, equipment, and other facilities, public or social, which these governments have built, purchased, or otherwise transferred to their ownership. Town or village self-government revenue sources include budget allocations from city or raion councils, voluntary donations of citizens and working collectives.

The following section brings the governmental structures of Tajikistan forward for consideration under core aspects of the LCCT.

15. p.10 of the Core document forming part of the reports of state parties. Tajikistan. 12 February 2004. Available here.
16. p.9, ibid.
17. p.9 of the Chapter 11. Local Government in Tajikistan by Mamadsho Ilolov & Mirodasen Khudoiyev.
18. p.62 of the Country Profiles of the Housing Sector. Tajikistan. UNECE. 2011.

2.1. MULTI-LEVEL INSTITUTIONAL COORDINATION

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
24.04.2008	Resolution No.189 on the Committee for Environmental Protection under the GoT
28.12.2012	Town Planning Code
19.11.2013	Decree of the President of the Republic of Tajikistan No.12 On Improving the Struc-ture of the Executive Bodies of State Power of the Republic of Tajikistan

The general state structure of Tajikistan directly influences multi-level institutional coordination across themes that include climate change and urban planning. The following analysis considers inter-institutional coordination among national and subnational governments across three tiers. These tiers consist of: (1) regions and Dushanbe city, (2) rural districts and cities, (3) settlements and villages.

The interrelationship of climate change and urban planning is a core focus in the following sections of this report, and it is noted that these two parallel spheres do not fully intersect at any level of government. This is illustrated in a breakdown of the powers attributed to each institutional tier in accordance with both themes, highlighting the points of contact between them.

2.1.1. Inter-institutional Coordination among National and Subnational Governments & Line Departments in Local Governments

Powers of the national government in urban planning are provided in Article 12 of the TPC and consist of:

- development and implementation of urban planning programmes in accordance with the legislation of the Republic of Tajikistan;
- adoption and approval of normative legal acts in the field of urban planning activities;
- determination the authorised state body in the field of architecture and urban planning;
- establishment of the procedure for exercising state control over compliance with the legislation on urban planning;
- approval of the general scheme of settlement on the territory of the Republic of Tajikistan and the planning schemes of the territories of the Republic of Tajikistan, GBAO, regions, the city of Dushanbe, cities and districts, urban planning documentation of objects of urban planning activities of special regulation or of national importance, as well as sectoral schemes for the development of the territory of the Republic of Tajikistan and projects for the development of engineering, transport and social infrastructures;
- approval of the general plans of cities and regional centres, referred by the legislation to its competence;
- approval of the boundaries of suburban areas of cities;
- establishment of the boundaries of objects of urban planning activities of special regulation or of national importance and the procedure for regulating urban planning activities in the territories of the corresponding objects;
- establishment of the procedure for maintaining the state urban planning cadastre and monitoring objects of urban planning activities;
- determination of the procedure for financing the preparation of urban planning documentation for objects of national importance, research work in the field of urban planning activities, and the development of urban planning norms and rules;
- establishment of the procedure for licensing in the field of urban planning activities;
- establishment of the procedure for organising and conducting state expertise of urban planning documentation;
- approval of the list of objects of republican and strategic importance, as well as a detailed list of objects of republican and strategic importance;
- establishment of the rules for identifying objects of unfinished construction and their introduction into civil circulation;
- approval of the regulations on local authorities for architecture and urban planning;
- definition of the rules for the pricing of construction works.

Responsibilities of the national government on issues arising from climate change are assigned to the Committee for Environmental Protection (CEP) as the Pilot Programme for Climate Resilience (PPCR) focal point to enforce environmental and climate change laws at all government levels (Resolution on the Committee for Environmental Protection under the GoT No.189 dated April 24, 2008). The administration of CEP must also approve all action plans (national programmes, strategies, etc.).

On the sub-national level of local government, consisting of regions, Dushanbe city, rural districts and cities as well as settlements and villages, powers are provided under Articles 14 and 15 of the Town Planning Code, and consist of:

Power of regions and Dushanbe city (Article 14 of the TPC)	Rural districts and cities (Article 15 of the TPC)
Monitor compliance with the legislation on urban planning and ensure the safety of the housing stock and public and industrial facilities	Ensuring the safety of the housing stock, buildings, and structures of public and industrial purposes
Solve the issues of resettlement and development of engineering, transport, and social infrastructures	Solving issues of resettlement, development of engineering, transport and social infrastructures
Perform the functions of a customer for the development of urban planning documentation on the construction of objects of local importance, provide their financing	Performing the functions of a customer for the development of urban planning documentation for the construction of objects of local importance and provide their financing
Make decisions on the construction of buildings and structures	Making decisions regarding the construction of buildings and structures, in agreement with the structures of the authorised state body in the field of architecture and urban planning
Restrict, suspend and prohibit urban planning activities on their territory if they do not comply with the requirements of the TPC and other regulatory legal acts of the Republic of Tajikistan. Restriction, suspension, and prohibition of urban planning activities of business entities is carried out in court, with the exception of cases of restriction and suspension of activities for a period of no more than ten working days in connection with the prevention of emergencies, epidemics and other real threats to the life and health of the population	Restriction, suspension, and prohibition of urban planning activities on its territory if it does not comply with the requirements of the TPC and other regulatory legal acts of the Republic of Tajikistan. Restriction, suspension and prohibition of urban planning activities of business entities is carried out in court, with the exception of cases of restriction or suspension of activities for a period of not more than ten working days in connection with the prevention of emergencies, epidemics and other real threats to the life and health of the population
Develop general plans for cities and regional centres of the respective territories and, in accordance with the established procedure, submit them for approval to the Government of the Republic of Tajikistan	Organisation of demolition of unauthorised constructed objects in accordance with the legislation of the Republic of Tajikistan
Approve general plans of settlements, rural settlements, projects of detailed planning of parts of the territories of settlements (detailed planning projects) and projects for the development of terrain and other elements of the planning structure of settlements in agreement with the authorised state body in the field of urban planning and submit for approval to the appropriate Majlis of People's Deputies	Development of general plans for cities and centres of districts of republican subordination and submission for approval by the Government of the Republic of Tajikistan in the prescribed manner
Carry out the development and implementation of planning schemes for the territories of the Gorno-Badakhshan Autonomous Region, regions, the city of Dushanbe, cities and districts, schemes and projects for the development of engineering, transport and social infrastructures, as well as landscaping	Development of general plans for cities, regional centres and settlements and their submission for consideration to the relevant Majlis of People's Deputies
Approve the plans for the district (groups of districts)	Development of projects of detailed planning for parts of the territories of settlements, plans for the development of localities and other elements of the planning structure of settlements and their submission, in agreement with the authorised state body in the field of architecture and urban planning, for consideration by the relevant Majlis of People's Deputies
Establish the boundaries of the objects of urban planning activities of special regulation or of local importance and the procedure for regulating urban planning activities in the territories of the corresponding objects	Organisation of an inventory of the technical condition of buildings, structures, and other objects of settlements
Provide financing and development of urban planning documentation for settlements, scientific research in the field of urban planning, maintaining a state urban planning cadastre, monitoring objects of urban planning activities, conducting complex engineering surveys, compiling seismic zoning maps for settlements, monitoring the implementation of urban planning documentation, and carrying out its expertise	Regularly informing the population about the decisions taken regarding urban planning activities
Regularly inform the population about the decisions made regarding urban planning activities	

Table 1. Articles 14 and 15 of the Dushanbe city's Town Planning Code.

The powers of self-government bodies of settlements and villages under Article 15 of the TPC in the field of urban planning include:

- ensuring the safety of the housing stock, public and industrial facilities on its territory;
- submission to the state authorities of districts and cities the necessary materials related to the issues of resettlement, the development of engineering, transport and social infrastructures, the development of urban planning documentation for the construction of objects of local importance.

It should be noted that each level of the sub-national government works independently, and the legislation does not outline a requirement for cooperation between them. This is largely due to the verticality of the urban planning function, wherein the jurisdiction of the supreme body supersedes any obligation for cooperation at the local level. Concomitantly, the accountability of local government to the central government, restricts their independence to build and improve capacities to implement their mandates. Employees must have appropriate education for their position, but the legislation does not enshrine, for example, the need to perform capacity needs assessments and mandatory periodic training, to promote knowledge exchange with other local governments, or to introduce performance-based incentives.

Based on the above outline, it can be concluded that concerns of climate change are integrated into the responsibilities of the national level government in the Republic of Tajikistan but that there is scope for their inclusion, consideration, and subsequent monitoring in the responsibilities of government bodies at the sub-national level.

There is a level of interaction between governmental tiers on the urban planning structure: the Committee for Architecture and Construction (CAC) forms part of national government and works together with local architecture and urban planning authorities. However, responsibilities on issues of climate change are largely focused in the level of national government, without established procedural links to local government bodies. This is potentially due to a low level of local government integration into legislation, which could imply further limitations to cooperation between individual local government departments.

2.1.2. Coordination across Line Ministries at the National Level

Figure 6 illustrates the structure of the executive branch according to the Decree of the President of the Republic of Tajikistan No.12 of November 19, 2013 On Improving the Structure of the Executive Bodies of State Power of the Republic of Tajikistan. This decree identifies two main committees between which functions relating to climate change and urban planning are divided, with the inclusion of their local authorities. Those are; the Committee for Environmental Protection and Committee for Architecture and Construction.

The Committee or Environmental Protection is the central executive body responsible for the implementation of a unified state policy in the field. This unified state policy in the field of environmental protection encompasses hydrometeorology, rational use of natural resources and nature management. Management of climate change related issues are further highlighted as among the committee's responsibilities. Section 2.4.2. of this document provides a detailed structure of all government departments that are charged with such responsibilities.[19] The structure of the Central Office of the CEP under the GoT includes:

- Front office;
- Monitoring and Environmental Policy Department;
- Administrative department (general, personnel, legal, special work and economic sectors);
- Department of Planning, Accounting and Finance;
- Department of State Control over the Use and Protection of Water Resources;
- Department of State Control over the use and Protection of Flora and Fauna;
- Department of State Control of the Use and Protection of Atmospheric Air;
- Department of State Control over the Use, and Protection of Lands and Waste Management;
- Sector of International Relations;
- Hydrometeorology Sector.

Weak integration of environmental aspects into sectoral legislation and strategic documents shows that, despite formal procedures for reviewing draft laws and strategic documents by all interested state bodies, the influence of the CEP on such documents is limited. Thus, the involvement of regional bodies of the CEP in projects for the protection of the environment is low.[20]

19. Resolution on the Committee for Environmental Protection under the Government of the Republic of Tajikistan dated April 24, 2008 No.189.
20. p.24 of the Assessment of ecological and social systems. Draft final version of the Report.

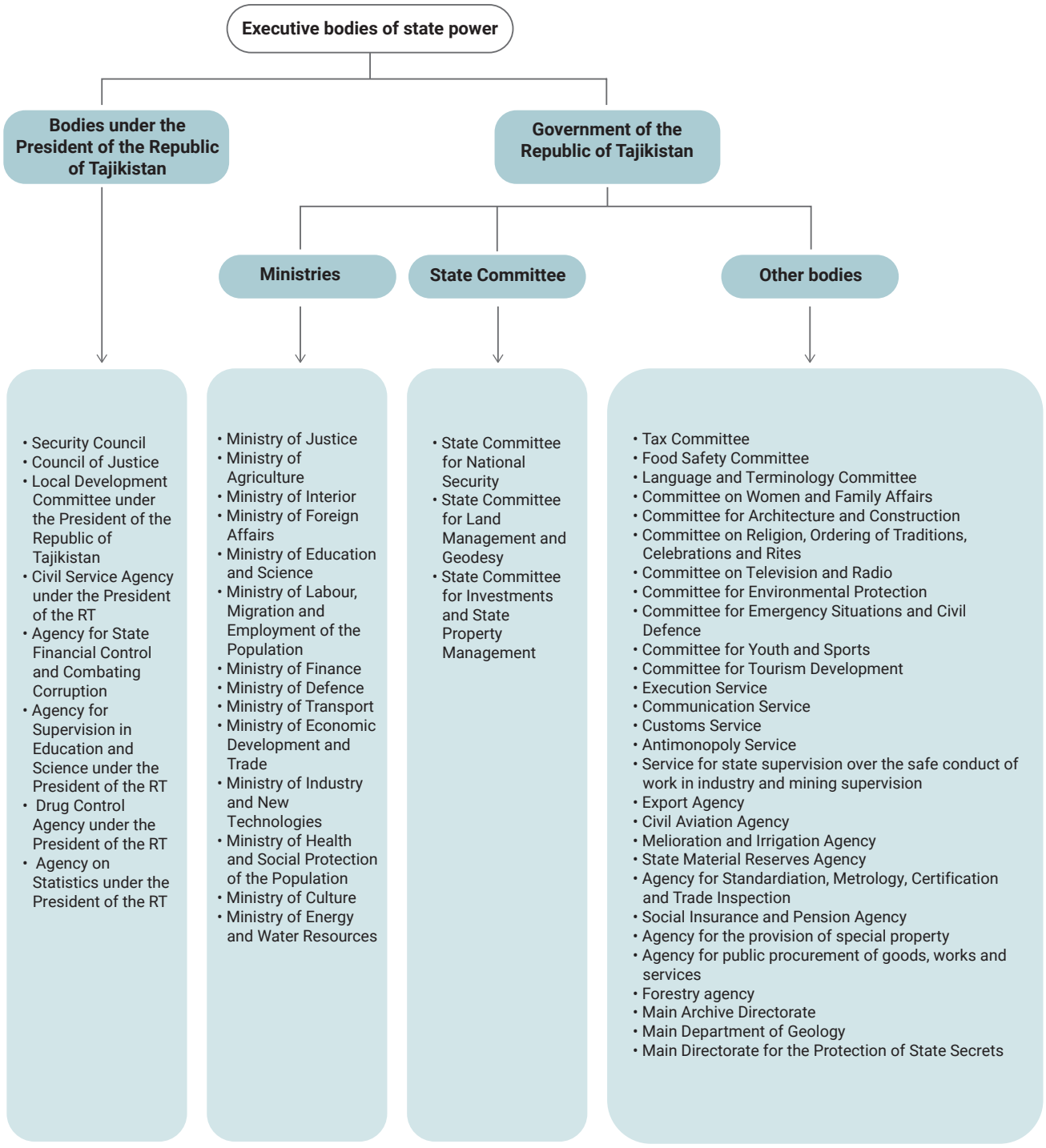


Fig 6. Structure of the executive branch, according to the Decree of the President of the Republic of Tajikistan No.12 of November 19, 2013

The body responsible for urban planning is the **Committee for Architecture and Construction** under the GoT. Its central office includes:

- Front office;
- Urban Development Department;
- Department of Science and Regulatory Regulation in Construction;
- Department of Construction Supervision and Integration Process;
- Department of Industry, Transport and Energy Programmes;
- Administrative department;
- Planning and accounting department;
- Legal department;
- Human Resources Sector.

The powers of this body include implementation of state policy in the field of architecture and urban planning and construction of facilities, cities and villages; development and maintenance of an urban planning cadastre; development of state programmes for architecture and urban planning; project concepts based on scientific research; control over the implementation of the state complex territorial organisational plan of regions and other administrative-territorial units of the Republic of Tajikistan, and General Plans of cities and settlements.

Low levels of collaboration are identified between the Committee for Environmental Protection (CEP) and the Committee for Architecture and Construction (CAC). In practice, a level of coordination occurs between line ministries at the national level during the General Plan approval processes, but not during the development of General Plans. Climate change issues are poorly integrated into the legislation of Tajikistan and neither committee has a basis for cooperation on this matter. Direct work is carried out by separate ministries in their own thematic areas, without much overlap.

2.2. PARTICIPATORY GOVERNANCE

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
28.12.2012	Town Planning Code

Stakeholder participation is a critical component of governance that ensures the delivery of quality that correspond to the real needs of the citizenry. Local stakeholders in urban planning for Tajikistan are considered to be legal entities for infrastructural management and service delivery (electricity, water, etc). These entities are able to communicate directly with local authorities on any points that may influence their operations during the preparation of General Plans. The local authorities will include their preferences in the final documents, which are then transferred to the Design Institute for further development of the prepared Plans. Though this process of stakeholder consultation is recognised, there is no legislation in the country that obligates authorities to identify territory-specific stakeholders in legal entities during the process of preparing development plans.

The general form of participatory governance required in these processes is enshrined in paragraph 4 of Article 6 of the Town Planning Code (TPC). This states that stakeholder parties can include both individuals and legal entities with interests related to the implementation of urban planning activities. More detail is disclosed in paragraph 1 of Article 9 of the TPC, which states that individuals and legal entities have the right to take part in the consideration and adoption of decisions related to urban planning activities. However, the legislation does not outline normative consultation requirements on the conduct of needs assessments through surveys and documentation, or in consultative meetings. Legislative provisions on this theme could be improved with the inclusion of such specifications.

2.3. DATA COLLECTION AND SHARING

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
28.12.2012	Town Planning Code

Environmental information collected by government-accountable bodies to aid in decision-making, is passed to the government itself in the form of periodic reporting. The use of environmental information, particularly, is lacking systemic coordination to ensure that data held by all parties is consistent. Environmental information is collected and stored in many ministries, departments and organisations, in addition to various departments of the CEP. There is no system for meaningful coordination between government agencies on the ground that would specify data sampling and processing methods or methods and timelines for exchange. There also lacks monitoring stations. As a result of this, collaboration and data exchange between producers is weak and

requires development. To date, there are no legal or administrative provisions on the production and exchange of environmental information.

Urban planning information is systematised to a greater degree than environmental data, which is regulated in Chapter 4 of the TPC. This section of the TPC outlines the information that should be contained in the urban planning cadastre, which includes:

- topographic, geodetic, and cartographic materials;
- information about the ecological, engineering-geological, seismic, hydrogeological state of the territories;
- information about engineering, transport, social infrastructure facilities, and land improvement;
- information on urban planning for the development of territories and settlements;
- information about the zoning of territories and urban planning regulations of territorial zones;
- information about the technical condition of the housing stock;
- information on monitoring objects of urban planning activities.

The TPC establishes a data collection and exchange system in the field of urban planning, and exchange between different levels of government does takes place. In the field of climate change, information is collected exclusively by the CEP and transmitted in periodic reports to the national government or in document drafts on UNFCCC compliance.

2.4. RECOMMENDATIONS

One of the **general recommendations** that we provide with the LCCT is the development of legislation for the management of issues related to climate change, and their convergence with urban planning. This does not only entail the creation of a legislative framework, but also a process of empowering existing bodies (such as CEP and its subordinate organisations) with a full range of powers to develop, control and implement climate change related management mechanisms. The following sections further detail our specific recommendations in accordance with the analytical themes of the LCCT.

It is of note that vertical axis coordination is predominant in Tajikistan, meaning that national government powers surpass and direct the roles of lower governmental bodies through a tiered system. The urban planning system is exemplary of this systemic inclination in which power over the development of General Plans is concentrated in the national government CAC. The TPC stipulates that **khukumats** are responsible for providing information on settlement conditions and plans for future development, and for the allocation of land for construction projects in their areas. However, the actual urban plans are developed centrally by the OJSC "Shahrofar". The following four recommendations have been formed in response to these findings.

Recommendation 1: Decentralisation of the urban planning system is recommended in a way that empowers local governments with the full scope of procedural tools to guide urban planning for their territories.

Recommendation 2: It is recommended that coordination among line ministries across tiers, both under the CAC and the CEP, is strengthened to complement a newly decentralised system of powers. This will increase the efficacy of the exercise of authority and improve accountability.

Recommendation 3: It is important to strengthen mechanisms for stakeholder engagement. This is partially addressed in existing legislation on the urban planning process, however, the current legislation provides only for very general guidance on the objective of inclusion without detail on recommended procedural norms. It is recommended that further, more detailed obligations be built into the legislative framework to ensure mechanisms are developed for consultation at various projects phases.

Recommendation 4: Coordinated data collection methods and aggregation assists public bodies in making informed policy decisions. Currently, collaboration on the collection and exchange of climate specific information between producers such as the CEP and the Committee for Emergency Situations and Civil Defence, is limited. There are no legal or administrative provisions to guide the production and exchange of such information, which leads to low levels of aggregation. The LCCT recommends that such information be collected at both local and national levels, and exchange systematised. Systematised collection and exchange provides for greater quantities of data to be produced at a range of sources, and aggregated to provide much more nuanced and detailed pictures of reality. Improved systems of exchange can reveal otherwise unseen correlations and patterns that can prove invaluable for the development of plans to tackle multi-dimensional challenges.

2.5. LCCT CHECKLIST 1: PLANNING INSTRUMENTS

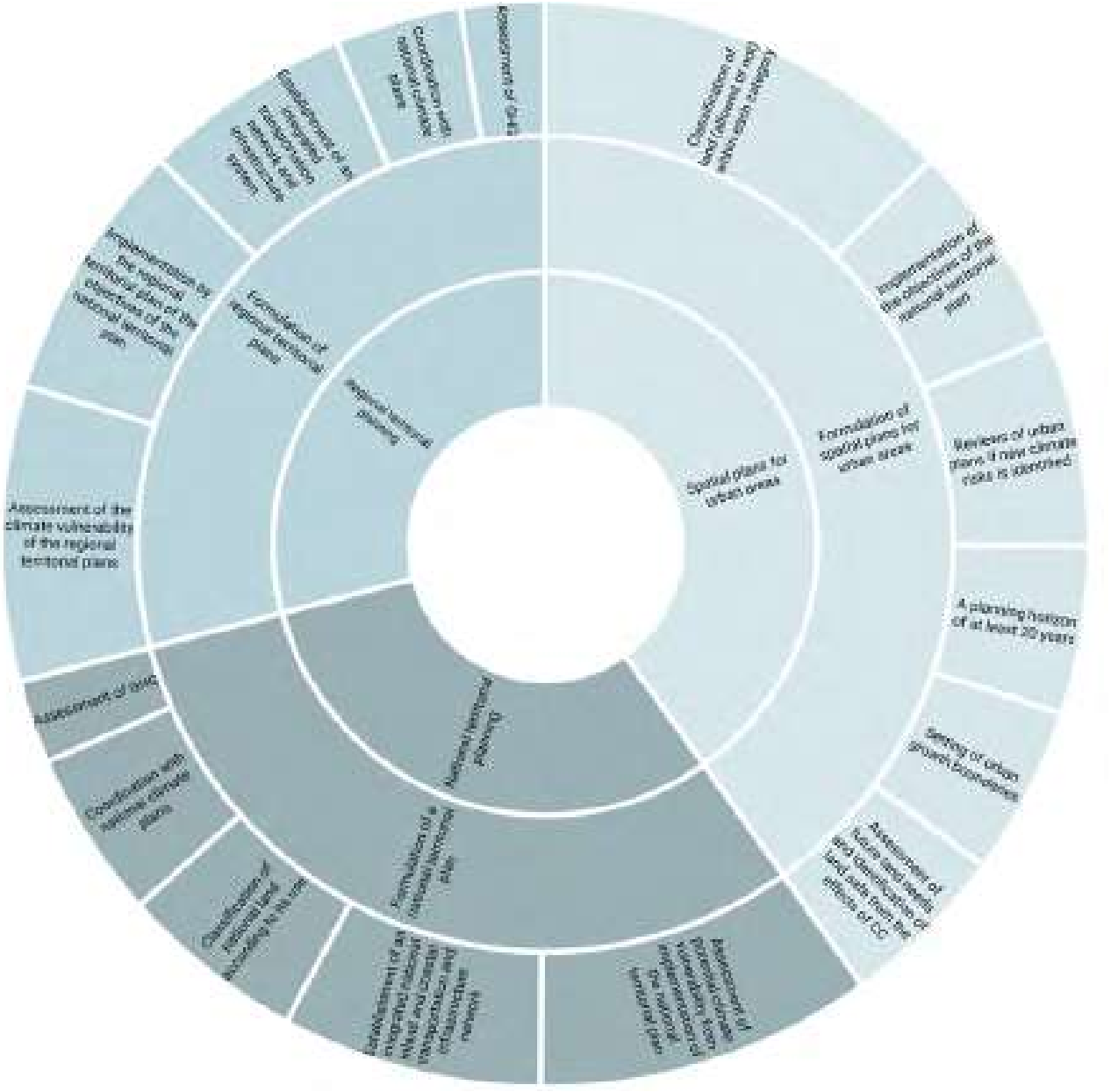
	Category	Present/ Absent
Multi-level institutional coordination	Does your country have provisions in legislation or regulations requiring multi-level institutional coordination for climate action and urban planning?	✗
	Do these include legal provisions that require inter-institutional coordination among national and subnational governments?	✗
	Do these include legal provisions that require coordination across line ministries at the national level?	✓
	Do these include legal provisions that require coordination among local jurisdictions that belong to the same metropolitan area?	NA
	Do these include legal provisions that require coordination between neighbouring cities and rural areas that are part of the same economic, social, or environmental functional areas?	NA
	Do these include legal provisions that require coordination among different line departments in local governments?	✗
Participatory governance	Does your country have provisions in legislation or regulations requiring engagement with local stakeholders, civil society and businesses in urban planning processes and climate planning processes?	✓
	Do these include legal provisions that require stakeholder and community identification?	✗
	Do these include legal provisions that require participation across the planning process and not only when the urban plans have already been developed?	✓
	Do these include legal provisions that require planning institutions to tailor participatory processes to specific community needs?	✓
	Do these include legal provisions that require consideration of, and response to, community demands priorities?	✗
	Do these include legal provisions that grant access to dispute or appeals mechanisms?	✗
Data collection and sharing	Does your country have provisions in legislation or regulations requiring data collection and sharing arrangements of climate sensitive information among different institutions dealing with urban planning and climate planning?	✗
	Do these include legal provisions that require data collection and sharing among local, subnational, and national levels?	✓
	Do these include legal provisions that require data collection and sharing among subnational governments (different cities, regions, provinces)?	✗
	Do these include legal provisions that require data collection and sharing among different departments and institutions in the same city?	✗
Local governments' mandate for urban planning in urban areas	Does your country have provisions in legislation or regulations assigning local governments the mandate for urban planning in their urban areas?	✓
	Do these include provisions with the clear definition of institutional roles and responsibilities?	✓
	Do these include provisions that require local governments to build and improve their capacities to implement their mandates?	✗
	Do these include provisions that require or facilitate informal and flexible inter-municipal collaborations, for urban and infrastructure planning, when administrative boundaries do not correspond to functional boundaries and morphological boundaries?	NA

Table 2. LCCT checklist 1

Fig 7. Alley in the central park og Khorog, May 2021

3

PLANNING TOOLS



Tajikistan's first explicit planning law after independence was the 1997 Law on Architecture and Urban Planning (preceded only by the Land Code of 1996). Its aim was to provide legal, organisational and social foundations for the regulation of architectural, urban planning and construction activities and to determine the rights and obligations of state bodies, individuals, and legal entities.[21] This law consisted of only 43 articles, which was short when compared with similar frameworks in the region. For example, the Town Planning Code of the Russian Federation consisted of 68 articles and the Kazakhstan Law on Architectural, Urban Planning and Construction Activities consisted of 79 articles.[22] The 1997 law also contained a number of contradictions and fragmented the issues at stake. The majority of those issues were eliminated in the updated Law on Architecture, Urban Planning and Construction Activities, of 2008.[23] Construction was considered as a systemically defined sphere of public relations that was to be regulated in full and directly by a single and orderly law with a high level of logical certainty. The "code" concept was introduced to meet that criterion in article 18 of the 2003 Law on Statutory Instruments and its use was further enshrined in Article 19 of the 2017 Law on Statutory Instruments of 2017.[24]

The Town Planning Code of 2012 was important as it generalised all legal, technical, and organisational mechanisms for architecture and construction. It provided 1,500 regulatory and technical documents consisting of the following building codes: 125 SNiPs, 774 GOSTs, and more than 220 documents on construction pricing.[25]

In 2014 the introduction of Regulation No.150 On the Committee for Architecture and Construction under the GoT created the Committee of the same name, abolishing and superseding the Agency for Construction and Architecture.[26] The Committee gained more independence in decision making as a central executive body of state power, whereas its previous status as agency restricted its powers to specific activities as an extension of a government committee.[27]

The adoption of the TPC engendered the full-scale regulation of the urban planning industry in the country. The Code functions in accordance with a three-tiered hierarchy of national, sub-national (regional) and local levels. A tiered approach to the territorial plan is a key component of the Panning Tools section of the LCCT Urban Law module. Therefore, the following sections outline the roles attributed to each of these three tiers of planning governance, tracing the integration of climate change considerations into urban planning at each level.

3.1. NATIONAL TERRITORIAL PLANNING

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
28.12.2012	Town Planning Code
03.01.2014	Procedure for the development of consolidated urban planning schemes for individual parts of the Republic of Tajikistan No.26
18.03.2014	Procedure for the development of the territory arrangement scheme for the territories of the Republic of Tajikistan
03.05.2014	Procedure for the development of sectoral schemes for the development of territories of the Republic of Tajikistan No.297
03.06.2014	Procedure for the development of a general settlement scheme on the territory of the Republic of Tajikistan No.373

The first and most prominent stage of territorial planning is national territorial planning, the main characteristic of which is to support, structure and balance the system of towns and cities it encompasses to ensure that they reach their social and economic potential.[28] This is achieved through an integrated approach to issues of settlement, planning and organisation of territories, and their further development - both spatial and economic. Though some countries have a unified document that incorporates and balances social, economic, and environmental growth, national territorial planning in the Republic of Tajikistan is outlined in four separate documents under paragraph 1 of Article 44 of the TPC.

21 Law on Architecture and Urban Planning dated 1997. Available here.
22 Analysis of the legislation of the Republic of Tajikistan in the field of construction dated July 27, 2008. p.10 – Available here.
23 Law on Architecture, Urban Planning and Construction Activities dated 2008. Available here.
24 Law on Statutory Instruments dated 2017. Available here.
25 National Report on the Development of Human Settlements of the Republic of Tajikistan for the UN World Conference on Human Settlements HABITAT III. p.80. – Available here.
26 Regulation No.150 "On the Committee for Architecture and Construction under the Government of the Republic of Tajikistan". Available here.
27 paragraph 10 Article 12 Law On the System of Government Bodies of the Republic of Tajikistan. Available here.
28 p. 8 of International Guidelines of Urban and Territorial Planning.

These documents are:

- **general map of population distribution** on the territory of the Republic of Tajikistan;
- **planning schemes for the development of specific portions of the territory** of the Republic of Tajikistan, including the territories of two or more regions (**consolidated urban planning schemes**);
- **territory arrangement scheme** of the Republic of Tajikistan;
- **sectoral schemes** for the development of the territory of the Republic of Tajikistan.[29]

Each of the four documents is regulated by separate procedures, which were approved by the government in 2014. For example, regulation on the **general map of population distribution** is enshrined in Procedure for the Development of a General Settlement Scheme on the territory of the Republic of Tajikistan No.373 dated June 3, 2014. Its key components include: determination of the goals of state policy in the field of urban planning and measures of state support for its implementation; zoning of the whole territory; main directions on development and improvement of the settlement system, nature management and production; main directions on development of engineering, transport and social infrastructures of national importance; measures to improve the ecological condition, rational use of lands, preservation of territories of objects of historical, cultural and natural heritage, and proposals for the establishment of the boundaries of objects of urban planning activities of special regulation and state importance.[30]

The **consolidated urban planning scheme** specifies the provisions of the general map of population distribution on the territory of the Republic of Tajikistan, defines the state policy in the field of urban planning on the territory of the object of urban planning activities, and formulates the basic principles of its implementation.[31]

The Territory arrangement scheme establishes zoning of the territory; main directions for improving the population distribution systems and their development; main directions for the development of industry, agriculture, engineering, transport and social infrastructures of regional and inter-settlement significance; boundaries of settlements, suburban areas and cities; measures to protect the territories of the Republic of Tajikistan from the impact of natural and man-made emergencies, to improve the environmental condition, and to preserve the territories of cultural heritage sites.[32] These schemes are subject to agreement with the local executive bodies of state power of the Gorno-Badakhshan Autonomous Region, regions, the city of Dushanbe, cities and districts, and the CAC, and further appropriate authorized bodies for land management, protection of historical monuments, state technical supervision, geology, sanitary and epidemiological supervision, transport, emergencies and civil defence (paragraph 12 of the Procedure for the Development of the Territory Arrangement Scheme for the territories of the Republic of Tajikistan).

Sectoral schemes are developed under the Procedure for the Development of Sectoral Schemes for the development of territories of the Republic of Tajikistan No.297, dated May 3, 2014. It specifies state policy in the field of urban planning strategy for the territory of the Republic of Tajikistan in the following areas: development of energy supply, gas supply, communications, water supply and sewerage; development of air, rail, road and other types of transport; protection of territories from dangerous geological and hydrogeological processes; environmental protection; placement of sectoral productive forces of the economy.[33]

Territorial zoning is applied at all three levels of planning, from national to local. Zoning guidance is provided in Article 31 of the TPC and zoning categories: residential; public and business; production; engineering and transport infrastructure; recreational and tourist; agricultural; special purpose; military facilities and other restricted areas; suburban. The application of zoning is designed to balance development across different territories, taking into account environmental concerns.

29. Town Planning Code.

30. paragraph 22 of the Procedure for the development of a general settlement scheme on the territory of the Republic of Tajikistan No.373 dated June 3, 2014. Available here.

31. paragraph 21 of the Procedure for the development of consolidated urban planning schemes for individual parts of the Republic of Tajikistan No.26 dated January 3, 2014. Available here.

32 paragraph 21 of the Procedure for the development of the territory arrangement scheme for the territories of the Republic of Tajikistan No.190 dated March 18, 2014. Available here.

33 Paragraphs 18 and 21 of the Procedure for the development of sectoral schemes for the development of territories of the Republic of Tajikistan No.297 dated May 3, 2014. Available here.

To conclude, national territorial planning in Tajikistan is extensive and inclusive of information from multiple sectors. This provides the baseline on which regional and local planning authorities build detail to orientate plans towards their specific territories. The remainder of this section follows the same hierarchical structure.

3.2. REGIONAL TERRITORIAL PLANNING

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
28.12.2012	Town Planning Code

Tajikistan consists of four administrative divisions, namely Sughd (capital Khudjand), Khatlon (capital Kurgan-Tyube), the Region of Republican Subordination (the administrative centre of which is also the national capital of Dushanbe), and GBAO (capital Khorog – its administrative centre). Regional territorial planning applies to this territorial and jurisdictional scale.[34]

The three-tier planning structure implies accountability of lower plans to those above, retaining consistency with core goals and reducing contradictions. This structure is enshrined in article 44 of the TPC but the code does not directly outline the requirements for lower planning tiers to implement the objectives of the national territorial plan.

Paragraph 2 of Article 44 of the TPC outlines details on the required documentation for the production of regional development plans for the territories of the Gorno-Badakhshan Autonomous Region, regions, and districts. These consist of:

- **layouts of the territories** of the Gorno-Badakhshan Autonomous Region, regions, the city of Dushanbe, cities and districts;
- **district** (groups of districts) **planning scheme**.

The District Planning scheme outlines main directions for a regional development plan of a territory within a district or group of districts, taking into account the local particularities of socio-economic development, natural and climatic conditions and population forecasts. It outlines the territorial zoning and its planning structure; measures to protect the territory from the impact of emergency situations of natural or technogenic character; directions for development of engineering, transport and social infrastructures of the inter-settlement values; territories of the reserve for settlement development; territories for individual housing construction, placement of gardens and vineyards and gardening partnerships; territories for public recreation; boundaries of settlements and suburban areas of cities.[35]

The structural progressions in the requirements for planning documentation suggest a strong sense of direct subordination through tiers of planning governance. All documentation is developed with reference to the goals established by the national plan, in such a manner as to build detail that is specific to the needs of the particular region. Thus, when developing local or regional plans, it is necessary to take into account the main provisions of the national territorial plan, as if detailing them at the regional and local levels.

3.3. URBAN PLANNING IN URBAN AREAS

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
28.12.2012	Town Planning Code

Paragraphs 3 and 4 of Article 44 of the Town Planning Code stipulates the documentation necessary for:

- the development of the territories of settlement: **general plans of settlements; projects of urban and settlement limits; sectoral schemes** and
- for building: **project of detailed urban planning; development project; design documentation.**

General plans of settlements are considered as leading documents at this scale of planning and are applicable for 20 years.[36] They are governed by Article 51 of the TPC and define the core priorities for the development of the territory of the settlement, considering the particularities of local socio-economic development, natural and climatic conditions, and population forecasts. They provide:

- zoning of territories and the sequence of their development;
- measures to protect the territory of the settlement from the impact of emergency situations of natural and technological character, development of engineering, transport and social infrastructures;
- the ratio of the built-up and undeveloped

34.p.7 of the Roadmap for National Strategy for financial education in Tajikistan.
35. Article 49 of Town Planning Code.
36. paragraph 7 of GNiP RT 30-01-2018 "Urban planning. Planning and development of settlements".

territory of the settlement;
- territory of the reserve for development of the settlement;
- the boundaries of the settlement.

Territorial zoning is an important aspect of General Plans that is enshrined in national legislation. Paragraph 2 of Article 30 of the TPC outlines the general zoning of territories in the republic and the mechanisms through which these principles should be applied to the General Plans. This tool is used to protect territories and living standards from the impact of disasters by limiting rights of use and construction in certain areas. There are several area categories that are used to limit use or construction, which include:

- the zone of protection of cultural heritage objects, protected areas;
- specially protected natural areas;
- sanitary zones;
- protective zones;
- sanitary protection zones;
- zones on water protection and coastal strips;
- zones of sanitary protection of water supply sources;
- areas of occurrence of minerals;
- areas exposed to natural and man-made emergencies;
- zones of environmental emergencies and environmental disasters;
- areas of extreme natural and climatic conditions.

Projects of urban and settlement limits are governed by Article 52 of the TPC and are developed from territorial planning schemes, district planning projects (groups of districts) and General Plans of settlements.

Sectoral schemes for the development of the territories of settlements, under Article 53 of the TPC, determine the main parameters and planning solutions for: development of energy supply, gas supply, communications, irrigation, water supply and sewerage; development of transport modes; placement of objects of sectors of the economy; protection of territories from dangerous geological and hydrogeological processes; civil protection of the population; environmental protection; protection of objects of cultural heritage and improvement and landscaping of territories

Projects of detailed urban planning are applicable for periods of 5-10 years,[37] and are governed under Article 54 of the TPC, based on the General Pan of a settlement. They determine: frontage lines; lines of regulation on development and use of land plots; land use boundaries; zoning of territories and the sequence of their development; mode of applying security zones; parameters of streets, driveways, pedestrian zones, as well as structures of transport, communications, engineering equipment and landscaping; the composition and placement of social and cultural facilities; volumetric-spatial and architectural planning solutions, density and building parameters, number of storeys, types of buildings and structures.

Development projects, under Article 55 of the TPC, are applicable for periods of 5 years[38] based on detailed urban planning approved projects within the boundaries of the established frontage lines or boundaries of land plots. They define building regulation lines; location of buildings and structures, the number of storeys, type and other characteristics; architectural solution of the building(s); systems of engineering equipment, communications and improvement, as well as the conditions for connecting these systems to the structures and communications of systems of engineering equipment, communications and improvement located outside the land plots, micro-districts and other elements of the planning structure of settlements; organisation of the movement of vehicles and pedestrians; public spaces. General structure of urban planning documents of three tires can be depicted as follows (Table 3).

37. ibid.
38. ibid.

Tier	Document title		Legal document
National territorial planning	general map of population distribution		Article 45 of the TPC & Procedure for the Development of a General Settlement Scheme on the territory of the Republic of Tajikistan No.373 dated June 3, 2014
	planning schemes for the development of specific portions of the territory/consolidated urban planning schemes		Article 46 of the TPC & Procedure for the development of consolidated urban planning schemes for individual parts of the Republic of Tajikistan No.26 dated January 3, 2014
	territory arrangement scheme		Article 47 of the TPC & Procedure for the development of the territory arrangement scheme for the territories of the Republic of Tajikistan No.190 dated March 18, 2014
	sectoral schemes for the development of the territory		Article 48 of the TPC & Procedure for the Development of Sectoral Schemes for the development of territories of the Republic of Tajikistan No.297, dated May 3, 2014
Regional territorial planning	layouts of the territories of GBAO, regions, the city of Dushanbe, cities and districts		Article 49 of the TPC
	district (groups of districts) planning scheme		
Urban territorial planning	the development of the territories of settlement	general plans of settlements	Article 51 of the TPC
		projects of urban and settlement limits	Article 52 of the TPC
		sectoral schemes	Article 53 of the TPC
	for building of the territories of settlement	project of detailed urban planning	Article 54 of the TPC
		development project	Article 55 of the TPC
		design documentation	General provisions of the TPC

Table 3. General structure of urban planning documents.

None of these documents name a concept of "urban growth boundaries", which are used to contain urban development. Though Article 51 of the TPC stipulates the ratio of built-up and undeveloped areas of a settlement territory, this does not prevent uncontrolled urban sprawl, which can have negative consequences on the sustainability and resiliency of cities.

The analysis of the three urban planning tiers and their components reveals different levels of correspondence to items of the Toolkit checklist in the themes of multi-level institutional coordination and **local government mandates for planning in urban areas.** On the theme of multi-level institutional coordination, it can be confirmed that there is presence of legal requirements for coordination across line ministries at the national level as outlined in the TPC. The legislation lacks requirements for coordination between national and sub-national levels, however, this is implicit to an extent in the tiered structure for planning, in which sub-national plans build on the outline provisions of those at the level above. Legislative requirements for multi-level institutional coordination on climate action in urban planning is clearly lacking. Mandates on such issues are fragmented across the legal frameworks in such a way that distances them from urban planning. The planning frameworks presented here do not contain consistent references to these challenges or how they should be brought through scales to ensure that they are embedded in all future strategies.

Anyway, there are still some issues in terms of urban planning and climate change that requires review. For example, it is necessary to make changes into

general plans in case a new climate risk arises and identification of land safe from the effects of climate change. Changes to approved urban planning documentation are made by decision of the body of approval, in accordance with justification provided by the body of architectural and urban planning activities, together with the developer. However, at no level or phase in the planning frameworks analysed in this section do stipulations appear on the necessity to conduct post-approval planning reviews in the event of new climatic risks being identified. This is largely due to the legislative separation of urban planning from climate change action. In addition, urban planning is legally regulated, whereas climate change action is not specifically enshrined in policy or law.

And although compliance with the requirements of environmental protection, as well as environmental safety is envisaged in the LCCT as the main requirement for urban planning activities, this provision did not find its continuation in the development of general plans and determination of lands safe to the results of climate change. Categories for territorial zoning outlined in article 31 of the TPC, do not include land reserved for resettlement in the event of climate change related disasters or ongoing challenges. However, General Plans provide reserve territories intended for future settlement development.

3.4. CLIMATE CHANGE CONSIDERATIONS IN URBAN PLANNING TOOLS

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
06.06.2003	National Action Plan for Climate Change Mitigation approved by the Decree of the GoT No.259
03.05.2006	National Action Plan for Environmental Protection approved by the Resolution of the GoT No.191
02.10.2019	National Strategy for Adaptation to Change Climate of the Republic of Tajikistan for the period up to 2030 approved by the Decree of the GoT No.482
International docs analysed in this section:	
07.01.1998	UNFCCC (accession)
2002	First NC
2008	Second NC
29.12.2008	Kyoto Protocol (ratification)
2014	Third NC
2015	INDC
20.03.2017	Paris Agreement (ratification)
2018	First Biennial Report of the Republic of Tajikistan

No country can tackle climate change alone but it is an important consideration for the future of Tajikistan as the impacts are likely to be acute.[39] This section examines legislation on climate change specifically, with reference to bodies responsible for its regulation and points of overlap with urban planning law.

Tajikistan is the smallest country in Central Asia, and also the only country in the region without access to a coast. Mountainous terrain covers approximately 93 per cent of the country's land area, with approximately 50 per cent located more than 3,000 meters above sea level. Altitudes vary from 300 meters above sea level in the western lowlands to over 7,000 meters above sea level in the Pamir mountains in the east. The mountainous terrain generates considerable complexity in the local climate system, making forecasting and long-term climate projections challenging. This has consequences in adaptation planning.[40] This complex topography, in a context of strong reliance on agriculture and hydropower (25 per cent of GDP and 98 per cent of total energy

39. p.76 of the National Action Plan for Environmental Protection, 200640. Article 49 of Town Planning Code.
40. p.16 of the Review of Current and Planned Adaptation Action in Tajikistan, 2016.

production, respectively) make the country highly vulnerable to climate change.[41] As a result, Tajikistan ranks first among Europe and Central Asia countries in a simplified index of climate change vulnerability, a condition which is enhanced by low adaptive capacity.

The state has been taking steps to manage climate change issues, one of which was accession to international treaties, which, according to paragraph 3 of Article 10 of the Constitution, form an integral part of the legal system of the republic.[42] However, Tajikistan has not yet developed comprehensive legislation on these issues and, in general, climate is not yet reflected in legislation on environmental protection, air pollution, or energy. Neither is it reflected in urban planning laws that direct implementation at each tier. The National Action Plan for Climate Change Mitigation adopted by Decree of the GoT No.259 on June 6, 2003 and the National Strategy for Adaptation to Change Climate for the period up to 2030, approved by the Decree of the GoT No.482 on October 2, 2019 are the only planning related documents that confront climate change. The following provides an analytical outline of the legal provisions in all documents that reference climate change, beginning with international legislation as this can often form the catalyst from which national considerations are developed.

3.4.1. International Documents

The United Nations Framework Convention on Climate Change (UNFCCC) dated 1992 is a key **international document** that provides guidance for cooperation among nations to address greenhouse gas (GHG)-induced climate change.[43] Tajikistan ratified the UNFCCC in 1998 (with the exclusion of Annex 1). The subsidiary Kyoto Protocol was ratified in 2008, and the Paris Agreement (second major subsidiary agreement) in 2017.[44] The core purpose of all these agreements is to stabilise the concentration of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic impact on the Earth's climate.

The commitments from the Republic of Tajikistan concerning the UNFCCC include:

- Formulation and implementation of measures to mitigate climate change by addressing the sources of anthropogenic emissions and removal by sinks of all greenhouse gases (GHGs), and measures to facilitate adequate adaptation to climate change;
- Promotion and cooperation in the development, application and diffusion of technologies, practices and processes that control, reduce or prevent greenhouse gas (GHG) emissions, and in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases;
- Cooperation in preparing for adaptation to the impacts of climate change;
- Integration of the problem of climate change into social, economic and environmental policies and actions;
- Promoting the international efforts to strengthen systematic observation, and opportunities in the field of scientific research related to the climate system;
- Promotion and cooperation in the field of information exchange, education, training and public awareness on climate change;
- Communication to the Conference of the Parties any information related to implementation, including national inventories of anthropogenic emissions sources and removals by sinks of all greenhouse gases, in accordance with Article 12.[45]

Tajikistan has prepared and submitted three National Communications (NCs) (2002, 2008, and 2014) based on the UNFCCC and, during the preparation of the First National Communication, it developed the National Action Plan of the Republic of Tajikistan on Climate Change Mitigation.

First NC to the UNFCCC was prepared in 2002 by the CEP under the GoT with support from the Global Environment Facility and the United Nations Development Programme. It focused on trends in greenhouse gas emissions, environmental vulnerability, national economy, and human health. The second NC was prepared in 2008 and focused particularly on informing decision makers, specialists, and the public at large of the pressing nature of issues stemming from climate change in Tajikistan, largely concentrating on freshwater resources and biodiversity. The third NC

41. p.1 of Republic of Tajikistan: Building Capacity for Climate Resilience.
42. Constitution of the Republic of Tajikistan.
43. p.2 of the United Nations Framework Convention on Climate Change, the Kyoto Protocol, and the Paris Agreement: A Summary.
44. Parties to the UNFCCC. Tajikistan.
45. p.28 of the National Action Plan for Climate Change Mitigation dated 2003.

included a GHG inventory for the period from 1990 to 2010. In general, all National Communications included an inventory of greenhouse gas sources and sinks, a vulnerability analysis of ecosystems and the economy, preliminary adaptation recommendations, and mitigation analysis. The Communications also outline expected climatic change impacts that the country will experience in the period up to 2100, including sector-specific implications and some priority measures, but most recommended actions relate to mitigation of greenhouse gas (GHG) emissions. It is of note that none of the three National Communications have included specific vulnerability assessments at the national, sectoral, or subnational level, as such assessments have, for the most part, not yet been conducted in Tajikistan.[46]

The 2003 National Action Plan for Climate Change Mitigation (NAPCC) is one of two national level documents that deal directly with climate change issues. This plan presents several priorities for adaptation alongside measures for reducing greenhouse gas emissions and maximising carbon sinks. The priorities are broken down by sector: water, agriculture, health, energy, and climate information and disaster risk management. The Action Plan also identifies the need for enabling activities that will support action in multiple sectors. It emphasises the need for systematic observation and monitoring, and for capacity improvements in data collection, analysis, modelling, and forecasting to support development and adjustment of adaptation measures. It also notes the need to strengthen institutional and technical capacities in the field of climate change and those related, including hydrology, agriculture, water resource management, and ecosystem conservation.[47] However, given that this policy was approved in 2003, a new strategy or plan was required to accompany it in which priorities for the country can be identified, adaptation measures listed, and responsibilities delegated to the key ministries and departments.

This accompanying plan was established in 2019 as the National Climate Change Adaptation Strategy (NCCAS). It aims to provide a guiding framework on the integration of climate change considerations into other national development plans, a process that is of paramount importance for the achievement of the Paris Agreement and the Sustainable Development Goals.[48] Such national strategies should provide a basis for more detailed National Adaptation Plans, specifying key sectoral priorities, cross cutting issues, implementation arrangements, financing mechanisms and sources, and monitoring and evaluation measures.[49] However, at the time of writing this report there are no such plans being developed in Tajikistan that respond to this Strategy.

Work is being done in Tajikistan on Climate Investment Funds (CIFs) – financing instruments designed to pilot low-carbon and climate-resilient development through the multilateral development banks under the UNFCCC. There are two funds of this category; The Clean Technology Fund and the Strategic Climate Fund. Several programmes are being enacted under the Clean Technology Fund including the Pilot Programme for Climate Resilience (PPCR), the Forest Investment Programme, and the Programme for Scaling up Renewable Energy in Low Income Countries. The PPCR is designed to deliver additional finance to countries to support integration of climate resilience into development planning and investments. This includes mechanisms that blend grants and highly concessional loans with domestic public and private financing. Tajikistan was nominated to participate in the programme in 2009,[50] which led to the development of the following:

- National development strategy;
- Poverty Reduction Strategy;
- Second NC to the UNFCCC;
- Other strategies such as National Strategies for Disaster Risk Management;
- Sectoral plans;
- Joint Country Partnership Strategies and an Inventory of the ongoing work of international organisations, bilateral donors and IFIs.[51]

The PPCR Secretariat also plays a key role in engaging stakeholders and providing technical assistance on adaptation issues, however, this entity does not currently have a legal status or official mandate within the government. Despite efforts and willing participation of Tajikistan in international programmes, capacity to

46. p.9 of the Readiness Proposal with United Nations Development Programme (UNDP) for Republic of Tajikistan dated 18 May 2020.
47. p.22 of the Review of Current and Planned Adaptation Action in Tajikistan, 2016.
48. Country background, Sustainable Development Goals and Paris Agreement.
49. p.3 of Submission of Tajikistan. Nairobi work programme on impacts, vulnerability and adaptation to climate change (FCCC/SBSTA/2013.L9).
50. p.5 and p.39 of the Climate change investment through the Pilot Programme for Climate Resilience in Tajikistan.
51. p.5 of the Pilot Programme on Adaptation to Climate Change (PPCR) as a driving force for resource mobilization in Tajikistan. Available here.

address climate change within the existing, national programmatic structures remains low. Capacity is hindered by several key factors: weak systems for accessing and managing hydrometeorological data and generating weather forecasts and climate projections; gaps in the knowledge-base on the implications of climate change in mountain environments; low awareness of climate risks and responses; lack of expertise in climate science and related disciplines; and limited knowledge on the socio-economic dimensions of climate change vulnerability and adaptation. Government actors struggle to draw the links between their sectoral mandates and climate change policies and programmes, viewing climate change as an environmental issue rather than a sustainable development issue.[52]

Fig 7 shows the only sectors in which climate change issues are accounted for in the pertinent legislation.

Despite commendable efforts to participate in international programmes and bring international agreements through to national legislature, the legislative base of the Republic of Tajikistan retains structural separations between issues of climate change and urban planning. Retaining these two separate structures through which separate plans are developed at both national and regional levels, means that the importance of climate change mitigation and adaptation will not be fully reflected upon in urban planning law and processes. Tajikistan still lacks an efficient climate-based policy and legal framework that could incentivise authorities to pursue climate adaptation initiatives,[53] including those that should be embedded in urban planning. At this stage, neither the provisions of the NAPCC, nor the NCCAS have a conciliatory character in urban planning. The former, which was developed before the TPC, prioritises hydropower, renewable energy, agriculture and forestry, disaster risk management and provision of meteorological services, without paying specific attention to urban planning or construction. The strategy could go some way towards extending these provisions, but no action plan has yet been created to implement it. However, the Strategy itself denies the applicability of climate change related measures in certain sectors itself.

52. p.25 of the Review of Current and Planned Adaptation Action in Tajikistan, 2016.
53. p.2 of National Adaptation Plan in focus: Lessons from Tajikistan.

Fig 8. Residential hoising under construction, May 2021

Sector	Adaptation priorities
Water 	• Improve hydrological observation, monitoring, and forecasting system • Implement water use efficiency and conservation measures in irrigation systems • Implement measures to protect against floods, mudflows, and • landslides; measures should include channel dredging, construction of dams and dikes, reforestation and other slope protection measures, and development of escape routes • Construct reservoirs • Monitor glacial melt and downstream water flows • Carry out adaptive redesign and protocols for operations and maintenance • Increase public awareness and capacity building on water management
Agriculture 	• Shift to drought-and-pest-resistant and salinity-tolerant crop varieties • Introduce practices to reduce erosion and salinisation and to increase soil fertility • Implement small-scale irrigation for crop and pasture lands
Health 	• Introduce community-based agro-forestry • WImprove rangeland monitoring and management • Establish/improve fodder and grain stocks • Rehabilitate forests in areas prone to drought and wind erosion • Provide financial services, including insurance, for households dependent on agriculture • Increase access to climate information for actors in the agricultural sector • Increase public awareness of climate change impacts on health • Establish a research centre on climate change and health • Introduce hydrotechnical, physical, and biological methods to protect against mosquitoes • Improve maternal and infant health services, taking climate risks into account • Improve access to safe sources of water • Improve nutrition, particularly for pregnant women
Energy 	• Construct or modify hydropower plants to address changes in river flows • Adjust dams and channels to protect facilities and downstream communities from floods and mudflows • Protect power lines and other infrastructure from floods and mudflows • Address sedimentation in facilities • Improve hydropower plant management to anticipate and respond to climate risks • Improve the hydrometeorological monitoring system
Climate information & Disaster risk management 	• Improve the hydrometeorological monitoring system • Strengthen forecasting and early warning systems • Strengthen emergency response systems • Continue institutional strengthening for hydrometeorological services[54]

54. p.23 pf the Review of Current and Planned Adaptation Action in Tajikistan.

3.4.2. State Actors

Fig 8 provides a structural overview of government departments in Tajikistan that have a role in addressing issues of climate change.

There is no indication of the role of the CAC in climate change related issues as it does not cooperate with the CEP on these matters. This implies that matters of climate change are not included in the development of certain documents in urban planning. Address of climate change issues is focused on water resources, agriculture, health, energy, and provision of climate information, indicated by cooperation between government agencies in these areas (MEWR, Ministry of Agriculture, etc), that is not present in departments of urban planning. Moreover, a clear lack of coordination can be identified between the various sectoral agencies on matters of climate change risk reduction, management, adaptation projects, and programme implementation, meaning that there is no inter-agency work conducted on climate vulnerability assessments to guide implementation of national and regional plans that accommodate these concerns. Though this structural organisation does not exclude the CAC and CEP from general cooperation, issues of climate change remain outside of them.

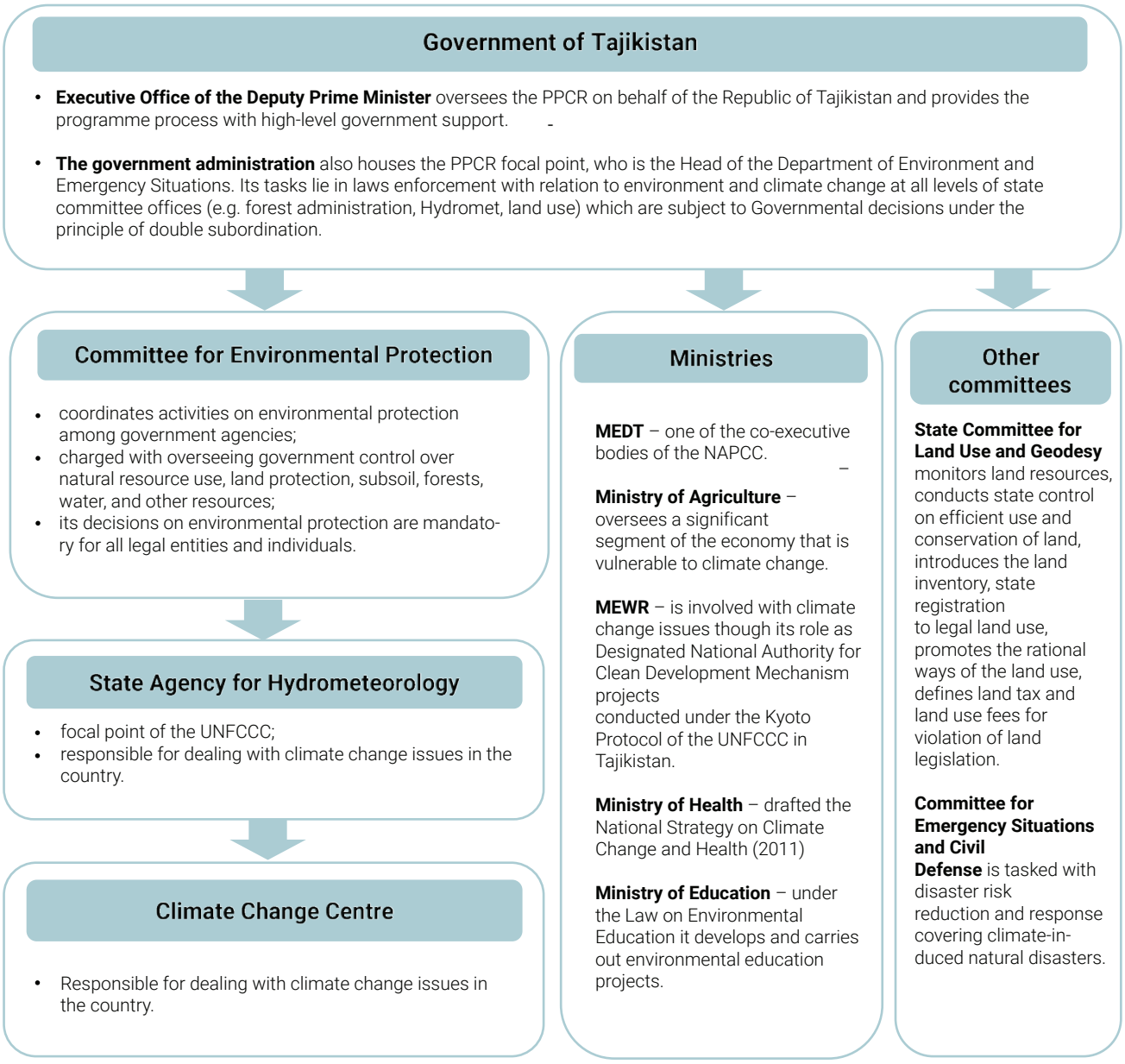


Fig 9. Government departments in Tajikistan that have a role in addressing issues of climate change

3.4.3. Greenhouse Gas Emissions in Urban Planning

Special attention should be paid to greenhouse gas emissions. Although this issue is addressed more closely in the fourth section of the LCCT and above in subsection 2.4.1, focusing on the issues addressed in the three NCs, this section will trace the linkages between greenhouse gases and urban planning. Tajikistan is among the countries least responsible for the release of greenhouse gas emissions that cause climate change, but one of the most vulnerable to the subsequent impacts.[55] Five different gases with direct greenhouse effect are present in Tajikistan's GHG inventory: Carbon dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Tetrafluorcarbon (CF4) and Hexafluorcarbon (C2F6). The results of calculation show that the greatest greenhouse gas emissions levels were observed in Tajikistan in 1991 and resulted in 31 million tonnes of CO-equivalent. The decrease in greenhouse gas emissions is mainly related to lesser energy expenditure in periods of economic decline and low provisions of energy infrastructure. This has also corresponded with increased absorption resulting from land use changes in the late 1990s.[56] As of now, the country contributes a low level of gross and specific greenhouse gas emissions but is characterised by an extremely high degree of vulnerability to climate change impacts, including the threat of frequent natural disasters.[57]

Greenhouse gases are highlighted in three NCs as sources of climate change, and in the First Biennial Report of the Republic of Tajikistan on the Inventory of Greenhouse Gases under the UNFCCC, for which Hydromet was responsible. A national inventory of anthropogenic emissions from sources and sinks of all greenhouse gases (GHG) not controlled by the Montreal Protocol, including a national inventory report is highlighted therein.[58] In October 2015, before the First Biennial Report of the Republic of Tajikistan on the Inventory of Greenhouse Gases under the UNFCCC, Tajikistan submitted its Intended Nationally Determined Contribution to implement the relevant decisions made by the UNFCCC's 19th and 20th Conference of the Parties, including the "Lima Call for Climate Action" (Lima, Peru, December 2014). The Intended Nationally Determined Contribution stated that priority attention would be paid to the implementation of the following:

- Medium-Term Development Programme of the Republic of Tajikistan for the period 2016-2020;
- Agriculture Reform Programme of the Republic of Tajikistan for the period 2012-2020;
- State Programme for Study and Preservation of Glaciers of the Republic of Tajikistan for the period 2010-2030;
- State Development Programme of Geology Industry of the Republic of Tajikistan for the period 2012-2020;
- National Strategy for Disaster Risk Management of the Republic of Tajikistan for the period 2009-2015;
- National Plan for Emergency Preparedness and Response of the Republic of Tajikistan.

Urban planning does is not fully included in the priority list, indicating that the link between urban planning and climate vulnerability is not fully considered. As a result, there is no programme document that enshrines the necessity to assess the relationship between GHGs and urban planning. This might be explained by the differing implications of climate change for urban and rural areas in the country.[59] Because of this, urban areas are considered less vulnerable in Tajikistan, while more severe consequences of climate change are expected in rural areas.

55. p.7 of Climate change investment through the Pilot Programme for Climate Resilience in Tajikistan.
56. p.67 of the National Action Plan For Climate Change Mitigation.
57. p.1 of the Intended Nationally Determined Contribution (INDC) towards the achievement of the global goal of the UN Framework Convention. on Climate Change (UNFCCC) by the Republic of Tajikistan.
58. p.13 of the First Biennial Report of the Republic of Tajikistan on Inventory of Greenhouse Gases under the UNFCCC.
59. p.20 of the Review of Current and Planned Adaptation Action in Tajikistan, 2016.

3.5. RECOMMENDATIONS

Based on the information presented in this section, the provided recommendations have been split into two stages, to be implemented simultaneously.

The first stage of recommendations relates to the integration of climate change issues as a consolidated law. As described above, the existing documents that govern climate change issues are the National Action Plan for Climate Change Mitigation and National Climate Change Adaptation Strategy. However, by nature, they are not legally binding. Thus, legislative regulation on climate change issues is required, which should include several items from the LCCT related to urban planning.

The **second stage of recommendations** is split into two simultaneous processes based in concerns of climate change and urban planning. Addressing climate change should include the following:

- making national climate plans mandatory by incorporating them into provisions of the law;
- creating the obligation to correlate national climate plans with national, regional and spatial territorial plans;
- provide for assessment of climate vulnerability in the implementation of the national, regional and spatial territorial plans;
- obligating the measure of GHGs when developing national, regional and spatial territorial plans;
- inclusion of a clear mandate for coordination with other ministries (primarily with the CAC) on issues of climate change in urban planning.
- Simultaneously, as climate change issues are included in legislation, there should be a process of alterations to the TPC to approximate urban planning and climate issues. This process should include the following:
- inclusion of urban planning as one of the sectors of required consideration on climate change issues (others include water, agriculture, health, energy, climate information and disaster risk management);
- a clear description of the possibility of revising urban planning documentation in cases of new climate risk identification;
- obligating the assessment of future land needs and identification of land that is safe from the effects of climate change during development of any of three-tier plans;
- setting urban growth boundaries during the development of General Plans;
- inclusion of a clear mandate for coordination with other ministries (primarily with the CEP) on issues of climate change in urban planning.

Fig 10. Mountanious area in Imomobod, May 2021

3.6. LCCT CHECKLIST 2: SPATIAL AND TERRITORIAL PLANNING

	Category	Present/ Absent
National territorial planning	Does your country have provisions in legislation or regulations requiring the formulation of a national territorial plan?	✓
	Do these include legal provisions that require the national territorial plan to classify national land according to its use, for example in urban and non-urban?	✓
	Do these include legal provisions that require the national territorial plan to establish an integrated national inland and coastal transportation and infrastructure network?	✓
	Do these include the legal requirement to coordinate the national territorial plan with national climate plans?	✗
	Do these include the legal requirement to assess potential climate vulnerability that could result from implementation of the national territorial plan?	✗
	Do these include the legal requirement to assess the greenhouse gas emissions associated with the implementation of the national territorial plan?	✗
Regional territorial planning	Does your country have provisions in legislation or regulations requiring the formulation of regional territorial plans?	✓
	Do these include legal provisions that require regional territorial plans to establish an integrated transportation network and infrastructure system?	✓
	Do these include legal provisions that require the coordination of the regional territorial plans with national climate plans?	✗
	Do these include legal provisions to ensure that regional plans implement the objectives of the national territorial plan?	✓
	Do these include the legal requirement to assess the climate vulnerability of the regional territorial plans?	✗
	Do these include the legal requirement to assess the greenhouse gas emissions associated with the regional territorial plans?	✗
Spatial plans for urban areas	Does your country have provisions in legislation or regulations that require the formulation of spatial plans for urban areas?	✓
	Do these include legal provisions that require urban plans to classify land based on what is and is not allowed within each category?	✓
	Do these include legal provisions that require urban plans to assess future land needs and identify land safe from the effects of climate change adequate to meet these needs?	✗
	Do these include legal provisions that require the setting of urban growth boundaries or other growth management strategies making sure that the amount of buildable land within the boundary is adequate to meet current and future land needs?	✗
	Do these include legal provisions that require a planning horizon of at least 20 years?	✓
	Do these include legal provisions that require reviews of urban plans if new climate risks or new climate adaptation options are identified?	✗
	Do these include legal provisions to ensure that urban plans implement the objectives of the national territorial plan?	✓

Table 4. LCCT checklist 2.

Fig 11. Pedestrian bridge in the central area of Khorog, May 2021

4

PLANNING FOR ADAPTATION

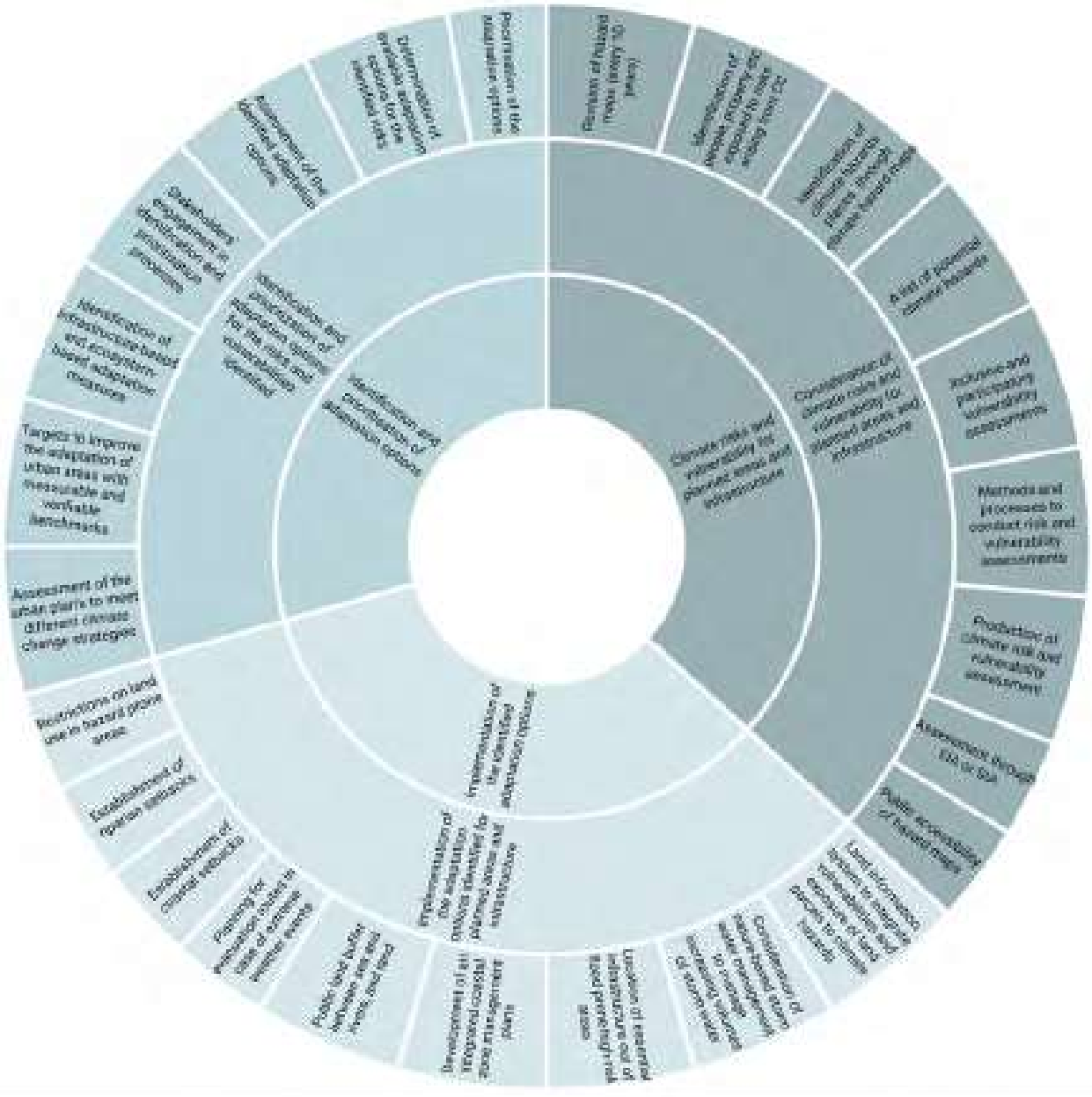


Fig 12. Planning for Adaptation diagram

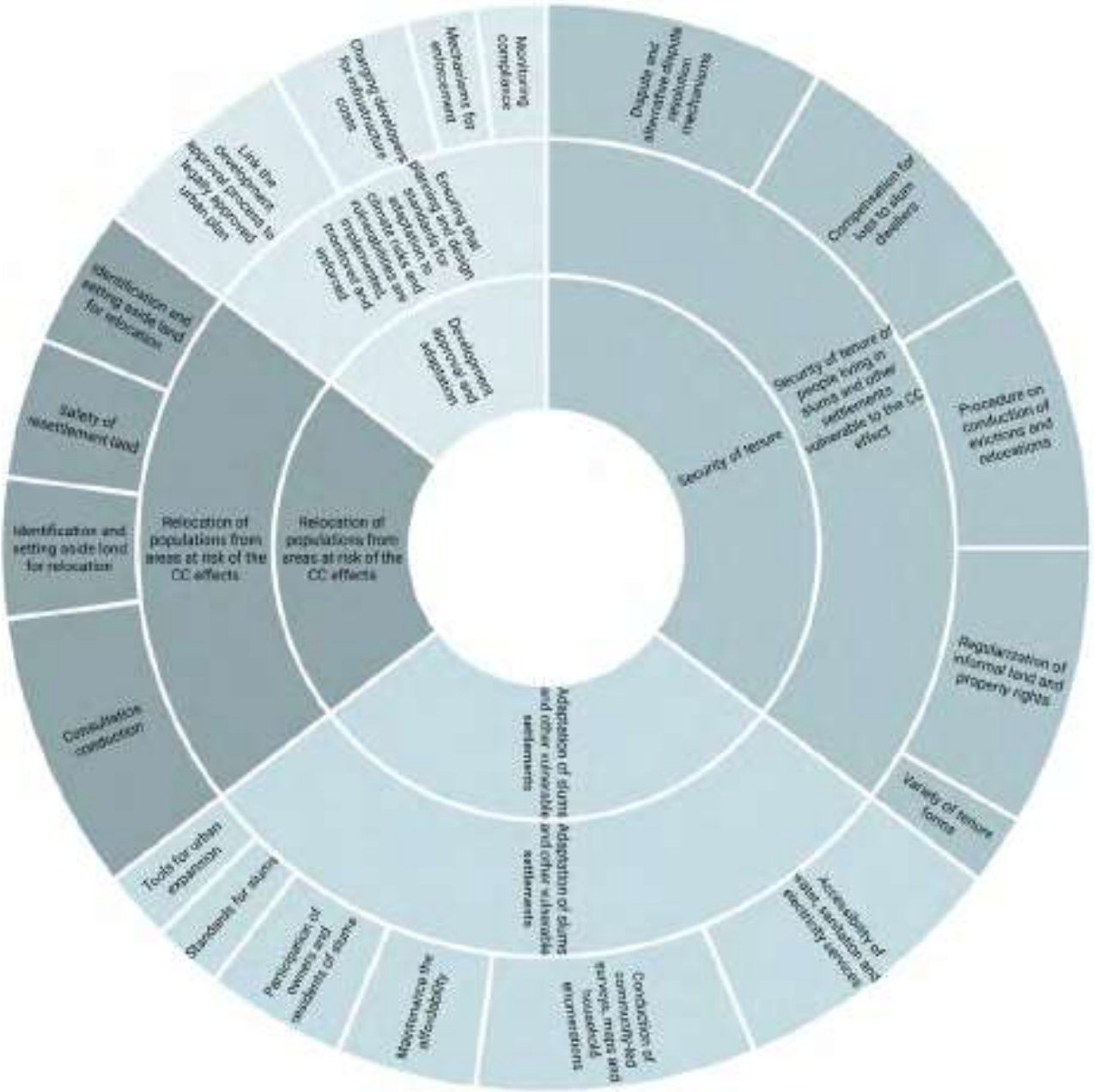


Fig 13. Planning for Adaptation diagram 2

4.1. CLIMATE RISKS AND VULNERABILITY OF PLANNED AREAS AND INFRASTRUCTURE

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
06.06.2003	National Action Plan for Climate Change Mitigation approved by GoT Decree No.259
15.07.2004	Law on the Protection of the Population and Territories from Natural and Man-made Emergencies No.53
30.03.2010	National Strategy of the Republic of Tajikistan on Disaster Risk Management for 2010-2015, approved by Resolution of the GoT No. 164
29.12.2018	National Strategy of the Republic of Tajikistan on Disaster Risk Reduction for 2019-2030, approved by GoT Decree No.602

At present, nowhere in Central Asia has the problem of climate change as a multiplier of insecurity reached such proportions as to cause serious concern, but still deserves constant attention. Thus, when analyzing the issues of climate change and the harm it brings specifically to Tajikistan, it is necessary to pay attention to the fact that the special vulnerability of Tajikistan is the cumulative result of the main problematic topics observed in the region – climate impacts, changes and extreme weather events in mountainous and densely populated areas; and cross-border tensions over water resources and energy development. All of them are further exacerbated by poverty. The southern regions of the country are particularly prone to climate change and extreme weather conditions. Despite these challenges, Tajikistan has pioneered the incorporation of climate change considerations into economic planning, linking investment to long-term climate projections in recognition of the link between climate resilience and economic security.[60] Key government programmes, strategies, action plans and regulations that reference climate change concerns include:

- National Development Strategy of the Republic of Tajikistan for the period up to 2030.
- Medium-term development programme for the Republic of Tajikistan for the period 2016-2020.
- National Strategy for Adaptation to Climate Change of the Republic of Tajikistan for the period up to 2030.
- Agriculture Reform Programme of the Republic of Tajikistan for the period of 2012-2020.
- Development programme for land reclamation and irrigation of the Republic of Tajikistan for the period up to 2020.
- State environmental programme and State programme of environmental education for the period of 2015-2020.
- National Public Health Strategy for the period of 2010-2020.
- Strategy for the reform of the water sector of the Republic of Tajikistan for the period up to 2025
- National Strategy of the Republic of Tajikistan on Disaster Management and Disaster Risk Reduction for the period of 2017-2030.[61]

Tajikistan ranks first among the countries of Europe and Central Asia in a simplified index of climate change vulnerability, largely due to its low adaptive capacity. Climate risk to planned areas and infrastructure can be considered using the simple equation; Climate Risk = Hazards x Vulnerability.[62] Under the National Strategy of the Republic of Tajikistan on Disaster Risk Management for 2010-2015 (approved by GoT Resolution No.164 dated March 30, 2010),[63] "hazard" types are divided into 4 groups that separate natural, biological and man-made emergencies:

60. p.6 of the Regional Assessment. Climate Change and Security in Central Asia. The Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan and the Republic of Uzbekistan.

61. p.3 of the Ensuring resilience to climate change through the national planning of adaptation measures in the Republic of Tajikistan by M.T. Safarov.

62. p.1 of the Module 4. Climate risk assessment at community level in the agriculture sector.

63. part 1 of the National Strategy of the Republic of Tajikistan on Disaster Risk Management for 2010-2015 No.164 dated March 30, 2010. Available here.

Hydrological and meteorological	Geological	Biological	Technological
• floods • drought • cold and frosts • snowfall • precipitation • hail • wind • avalanches • desertification • high groundwater	• mudslides • landslides • earthquake • rockfalls	• epidemics • epizootics • epiphytotia	• industrial waste • hazardous biological waste • unplanned emissions of chemicals (air, water, land); • accidents at hydraulic structures (i.e. related to dams, irrigation systems, etc.); • road traffic accidents, including those related to rail, road, air and water transport; • road traffic accidents during the transportation of dangerous goods; • accidents related to gas, fuel and pipeline heating; • accidents associated with life support systems.

Table 5. Four "harzard" types groups [63].

In alignment with the provisions of the LCCT, we will consider the first two groups exclusively, as these constitute direct climate-related hazards.

Climate change is the core driver behind the doubling of natural disasters witnessed globally since 2000.[64] As Tajikistan is highly prone to climate risks, the topic has been significant in the country for a much longer period. In the last year, The numbers of natural hazard incidents have increased by these percentages: Avalanches – 45%, Landslides – 3%, Rock-falls – 5%, Mudflows – 17%, Strong winds 10%, Heavy rainfalls – 4%, Inundation – 2%, and Earthquakes – 5%.[65] Despite this rising risk, legislation to mitigate these risks and their impacts remains fragmentary, especially in relation to urban planning processes.

The current state of the legislative system of the Republic of Tajikistan for the field of natural and man-made emergencies can be characterised as developed to a certain extent. A number of important regulatory legal acts have been adopted, among which are laws on the Protection of the Population and Territories from Natural and Man-made Emergencies, on Civil Defence, on Emergency Rescue Services, Emergency Rescue Teams and the Status of Rescuers, in addition to a number of bylaws.[66] The content of these documents shows the hazards are addressed therein.

The National Action Plan of the Republic of Tajikistan for Mitigation of Climate Change Effects was approved by GoT decree No.259 on June 06, 2003 and followed by the National Strategy of the Republic of Tajikistan on Disaster Risk Management for 2010-2015, approved by GoT Resolution No. 164 on March 30, 2010. The Action Plan was developed with climate change forecasts and described the potential for hazard frequency and exposure to increase over the following 40 years (up to 2050).[67]

Legislation in the country does not address hazard categories (such as natural and engineered) separately but instead, combines them in the more generic term of 'emergencies' under Law No.53 of July 15, 2004, on the Protection of the Population and Territories from Natural and Man-made Emergencies.[68] Article 2 defines an emergency as a situation resulting from an accident, hazardous natural phenomenon, catastrophe, or other disaster that may or have already resulted in human casualties, damage to human health or the environment, and/or significant material losses and disruption of living conditions.

In urban planning legislation, the TPC dictates that the general map of population distribution distinguishes territories of extreme natural and climatic conditions and territories exposed to natural and man-made

64. 'Staggering' rise in climate emergencies in last 20 years, new disaster research shows.
65. p.8 of the Overview of Emergency Situations in the Republic of Tajikistan for 2020. Available here.
66. p.57 of the DIPECHO/UNDP Sixth Plan: Assessment of Disaster Risk Reduction Capacities in Kazakhstan, Kyrgyzstan and Tajikistan. Available here.
67. Ibid.
68. Article 2 of the Law On the protection of the population and territories from natural and man-made emergencies No.53 of July 15, 2004. Available here.

emergencies, and that regional and territorial documentation define measures to protect the territory of the district (or group of districts) from the impact of natural and man-made emergencies. This document also specifies the requirement for hazard maps showing floods, drought-prone areas, areas at risk of landslides, mudflows and avalanches. The Information and Analytics Centre, under the Committee for Emergency Situations, leads this work with information and reports received on daily weather conditions from the Agency for Hydrometeorology. This contributes to work in monitoring, forecasting, prevention, reduction, and emergency recovery, as well as risk mapping.[69]

Although the TPC contains specifications on measures to protect territories from the impact of natural and man-made emergencies, there are also certain limitations. The National Strategy of the Republic of Tajikistan on Disaster Risk Reduction for 2019-2030 No.602 dated December 29, 2018, states that there were no state structures directly responsible for the management of activities in assessment and disaster risk reduction at the time of its adoption.[70] Two core problems in urban planning for climate change are indicated in this document:

- governance capacity gaps during the civil war led to unplanned and unregulated development, creating a legacy of housing and other infrastructure located in hazardous areas. In some cases, development in these hazardous areas continues;
- a lack of tools to assist in making effective management decisions. For example, to allocate land for housing construction, a narrowly focused threat assessment is conducted instead of a standard risk assessment. Many local governments do not have access to current data on land characteristics, land use, hazard frequency calculations, and flood hazard maps.

Global reports produced in Tajikistan (e.g. NCs under the UNFCCC) that present information from large-scale studies on the vulnerability of natural systems and specific economic sectors, focusing on knowledge development, listing capacity development needs and directions for action,[71] are not widely used in the urban planning process. Thus, although the legislation presents general measures for the assessment of climate risks (or "hazards"), their application in urban planning is limited. When comparing with the guidelines of the LCCT the legislation clearly excludes methods and processes to conduct risk and vulnerability assessments (though the UNDP drafted Manual on Regional Disaster Risk Assessment on the territory of the Republic of Tajikistan)[72] that would identify potential climate hazards, stakeholders, people, property, and economic sectors exposed to risks.

The main climate change adaptation efforts in Tajikistan are focused on hydro-energy, renewable energy systems, agriculture and forest management, adequate response, reduction of disaster risks as well as the provision of hydro-meteorological services.[73] As above, these do not extend to urban development processes. However, all three levels (national, regional, and spatial) of strategic documents for territorial planning described in Chapter 2 should be subject to strategic environmental assessment (SEA) by nature. In general, the environmental assessment system in Tajikistan is based on the well-known EIA-EA model. In this model, the environmental assessment system provides for the following distribution of responsibilities and rights between customers and government agencies:

1) **The Customer** is responsible for organisation and conduct of environmental impact assessment (EIA) at all stages of planning and design of facilities and new activities, financing the development of materials for EIA, organising public discussions on planned activities, and submission of EIA materials required for state geological expertise.
2) **The specially authorised body** organises the state ecological expertise (Article 6 of the Law on Environmental Expertise). It should be noted that activities of state environmental expertise (SEE) are carried out by expert commissions (Article 10 of the Law on Environmental Impact Assessment). Together with customers and developers, these commissions are defined as SEE subjects (Article 8 of the Law on Environmental Impact Assessment).[74]

69. p.32 of the Final report. Study on Disaster Prevention on the Pyanj River.
70. paragraph 60 of the National Strategy of the Republic of Tajikistan on Disaster Risk Reduction for 2019-2030 No.602 dated December 29, 2018. Available here.
71. p.13 of the Third National Communication of the Republic of Tajikistan under the United Nations Framework Convention on Climate Change
72. Draft of the Manual on Regional Disaster Risk Assessment.
73. p.13 of the Third National Communication of the Republic of Tajikistan under the United Nations Framework Convention on Climate Change.
74. p.9 of the Review of the compliance of the national legislation of the Republic of Tajikistan with the provisions of the Protocol on Strategic Environmental Assessment.

However, such documentation contains only general requirements for the content of environmental information in urban planning projects, without focusing on climate change issues.

4.2. IDENTIFICATION AND PRIORITISATION OF ADAPTATION OPTIONS

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
15.07.2004	Law on the Protection of the Population and Territories from Natural and Man-made Emergencies No.53
29.12.2018	National Strategy of the Republic of Tajikistan on Disaster Risk Reduction for 2019-2030 approved by the Decree of the GoT No.602
27.11.2019	National Development Strategy of Tajikistan until 2030 approved by GoT Decree No. 585
02.10. 2019	National Strategy for Adaptation to Climate Change until 2030 by GoT Decree No. 482

The risks associated with climate change and adaptation measures to reduce consequences for the population and key sectors of the economy are important elements of the National Development Strategy of Tajikistan to 2030 (approved by GoT Decree No. 585, dated November 27, 2019). For the same term, the National Strategy for Adaptation to Climate Change to 2030 (by GoT Decree No. 482, dated October 2, 2019) further contributes to the formulation and implementation of climate change and adaptation policy in the country. It is aimed at supporting economic growth and accelerating the modernisation of all economic sectors, diversifying and strengthening the global market, and increasing the competitiveness of the Tajik economy with increased adaptability and energy efficiency. This document will guide the country to adopt a more comprehensive and dynamic approach to planning its sustainable development, particularly of its economy, and to consider medium and long-term forecasts and variability of climate change.

The National Strategy for Adaptation to Climate Change document identified four climate sensitive sectors as priorities for development: (1) energy, (2) water resources, (3) transport and (4) agriculture. It also included seven cross-cutting areas (see Fig 12):

Fig 14. Seven cross-cutting areas of four climate sensitive sectors under the National Strategy for Adaptation to Climate Change

The National Strategy of the Republic of Tajikistan on Disaster Risk Reduction for the period of 2019-2030 was approved by GoT Decree No.602, dated December 29, 2018, predating those listed above. This document analysed the progress in disaster risk reduction for the period of 1997-2018, examined the strengths and weaknesses of the risk management process. It focused on methods of preparedness and response to disasters and determined the goals and objectives of a new strategy for disaster risk reduction based on existing problems in Tajikistan. The priorities defined in the strategy that are pertinent to the LCCT framework are as follows:

- development of a regulatory framework to strengthen risk mitigation measures and integrate risks into development initiatives, in particular in the infrastructure sector;
- conducting regular assessments of natural disaster risk, including determining the vulnerability of the population, considering gender and age factors, disability, characteristics of threats and their possible consequences (risk profiling), and available resources for management;
- development of a system for the

implementation of climate change adaptation, integrating natural disaster prevention into regional programme documents, strengthening of local capacity for disaster risk management.

Though these provisions are important, the LCCT is designed to assess legal acts and their implementation. Though the above National Strategies identify important topics for consideration and prioritise adaptation, they do not obligate actions. These strategies provide a contextual roadmap from which further laws and regulations should be developed. Thus, there remains room for improvement wherein the priorities identified for adaptation should be brought into law.

4.3. IMPLEMENTATION OF THE IDENTIFIED ADAPTATION OPTIONS

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
28.12.2012	Town Planning Code
29.12.2018	National Strategy of the Republic of Tajikistan on Disaster Risk Reduction for 2019-2030 approved by GoT Decree No.602
02.10. 2019	National Strategy for Adaptation to Climate Change until 2030 by GoT Decree No. 482

Central Asia is a disaster-prone region and Tajikistan is vulnerable to various hazardous natural events, including floods, earthquakes, mudflows, landslides, epidemics, droughts, avalanches, insect infestations, and storm winds. It is also vulnerable to technological threats, such as industrial and transport accidents. In this context, Article 30 of the TPC provides guidelines for the restriction of rights to use and develop territories in areas that are subject to threat from natural and technological emergencies. This section of the TPC should be considered in conjunction with the Law on the Protection of the Population and Territories from Natural and Man-Made Emergencies (No.53 of July 15, 2004), the National Strategy on Disaster Risk Reduction for 2019-2030, and the National Strategy for Adaptation to Climate Change to 2030. The purpose of these documents is to ensure that coordinated and consistent actions are taken to address the growing risk of climate change, natural disasters, and reduce further negative impacts, including events of death, injury, and economic loss.

Currently, the system for alerts in the event of imminent natural or technological disaster is week. Alert messages for possible emergency or disaster events should be more timely, accurate and understandable for target users. Analysis of incoming data should also be linked to risk assessments and based on a sufficient number of data sources (for example, meteorological stations and glacier monitoring data) so that alerts are sent to the specific areas and people affected. Alerting should not be limited to reports of natural disasters but should cover other events affecting the life and well-being of the population of Tajikistan. Broadening the range of alerts in this way, especially if the distribution process is decentralised, will allow at-risk populations to take preventive measures to reduce relevant risk factors and avoid or significantly reduce the impact of potential disasters. This process should consider existing work in related areas to improve weather forecasting, such as the Climate Resilience Programme. However, to address all these challenges, a common country-wide alert platform involving multiple government departments is required. For this to be possible, the issue of sustainable financing to support the activities of such a platform requires resolution.[75]

Urban planning is also insufficiently developed in this area. The planning system does not account for the onset of climatic risks and adaptation to them (for example, a public land buffer between rivers and land or coastal setbacks is not provided). Though the Law on Specially Protected Natural Areas contains reference in Article 14 to security (buffer) zones, they are set to prevent or mitigate harmful effects on the natural conditions of specially protected areas, their use in other territories. The same fragmentary approach can be observed in urban legislation, with no unified system for climatic protection.

75. paragraphs 66-68 of the National Strategy of the Republic of Tajikistan on Disaster Risk Reduction for 2019-2030. Available here.

4.4. ADAPTATION OF SLUMS AND OTHER VULNERABLE SETTLEMENTS

93 per cent of the territory of Tajikistan is occupied by mountains, which limits the available land area suitable construction. Only 7 per cent is suitable for living, meaning it can host construction and agriculture. For example, GBAO is the largest region, occupying 45 per cent of the entire national territory, of which, only 3 per cent is suitable for living. A significant proportion of the remaining territory can be considered as vulnerable to climate change and is further unsafe for human habitation. The economic limitations that lead to "slum" development can exacerbate such risks. The legislation in Tajikistan does not specifically regulate such settlements due to the general absence of such a concept in the country. Moreover, as climate related policy and law is generally limited in Tajikistan, there is little with which to expound the connection to slums within the framework of the LCCT.

4.5. RELOCATION FROM RISK AREAS

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
11.12.1999	Law On Migration
03.05.2010	Procedure for Environmental Migration in the Republic of Tajikistan, approved by the Resolution of the GoT No.211
28.12.2012	Town Planning Code
28.11.2020	Decree of the GoT No.648 On the Medium-Term Plan for Organised Resettlement of Environmental Migrants for 2021-2023

Tajikistan has long been prone to natural disasters, but it is expected that climate change will lead to increased intensity and frequency of events (drought, floods, etc.). This, in turn, will increase the risk of resettlement and internal migration. These connections were expressed in the Law on Migration dated 1999 as the concept of environmental migration, as the process of forced movement of citizens within the territory of their country due to the deterioration of the living environment and environmental disasters. The resettlement procedure is outlined in both the 1999 Law on Migration and the Procedure for Environmental Migration in the Republic of Tajikistan, approved by Resolution of the GoT No.211, May 3, 2010.[76] According to the information provided in the Procedure, population resettlement from ecologically hazardous zones will be enacted in the following cases:

- when exposed to landslides
- landslips
- avalanches
- emergency technogenic situations
- mudflows
- other natural disasters.

The organisation and procedural control of environmental migration is assigned to the Migration Service of the Ministry of Labour, Migration and Employment of the Population, and the executive bodies of state power of the Gorno-Badakhshan Autonomous Region, regions, cities and districts, according to the list approved by the Government Commission, to provide environmental migrants at their new place of residence with housing or a plot land. Resettlement is most often to meadows or unoccupied areas (under Article 44 of the Town Planning Code these are the territories of the reserve for the development of settlements). Under chapter 3 of the Procedure for Environmental Migration, in order to ensure the social and legal protection of environmental migrants, the authority of the ministry, departments and local executive bodies of state power, should undertake the following work:

- annual allocation from the republican budget of funds for preferential loans, one-time material assistance and payment of travel expenses;
- provision of transport services during the resettlement of migrants from hazardous ecological zones to safe places;
- ensuring the construction of transport roads, renovation and restoration of on-farm roads in new places of residence;
- provision of medical care during the resettlement of environmental migrants to new places of residence;
- construction of medical institutions and their provision with specialists in this industry;
- creation of preschool and general education institutions in new places of residence;
- ensuring the safety of the convoy of environmental migrants during their movement to new places of residence;
- organisation of water supply construction work to provide drinking water, and water for irrigation of household plots (vegetable gardens) in new

76. Procedure for Environmental Migration in the Republic of Tajikistan, approved by the Resolution of the Government of the Republic of Tajikistan No.211 dated May 3, 2010. Available here.

places of residence;
- assistance in the organisation of dekhkan farms and the development of uncultivated and fallow lands in new places of residence;
- gratuitous allocation of land plots for the construction of housing in safe places and paperwork in the preparation of a master plan and certificate of state registration;
- if necessary, provision of tents for environmental migrants;
- preparation of the Master Plan in new places of residence;
- assistance in the construction of structures and residential buildings for environmental migrants;
- assistance in the construction of power lines in new places of residence;
- organisation of rural infrastructure.

These actions are in addition to payment of a preferential loan in the amount of 3000 (three thousand) somoni to each affected family, one-time financial assistance in the amount of 100 (one hundred) somoni to the head of the affected family and 50 (fifty) somoni for each family member.

In turn, according to the GoT Decree No.648 of November 28, 2020 on the Medium-Term Plan for Organised Resettlement of Environmental Migrants for 2021-2023,[77] (the previous was also applicable for 3 years – from 2017 to 2020), the chairperson of the GBAO, regions, the city of Dushanbe, cities and districts and the State Committee for Land Management and Geodesy of the Republic of Tajikistan must annually, by November 1, determine places of resettlement for environmental migrants in the manner prescribed by law. By March 1 of the next year, in accordance with the plan, these parties must complete preparatory measures for resettlement of migrants, as well as timely allocation of land plots.

However, due to the topography there is a scarcity of suitable land. Under these conditions there remains a danger that environmental migrants could be relocated either to lands that remain hazardous, or to lands that are well separated from other centres, with limited sources of income. This type of scenario is prevalent in Tajikistan and can lead to return migration or migration to alternative sites. This is exacerbated by the fact that ecological migrants are not consulted during the resettlement processes.

4.6. SECURITY OF TENURE

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
13.12.1996	Land Code

Examining security of tenure under the guidelines of the LCCT includes items of protection for informal settlers to exercise their rights to land. In the context of Tajikistan, this issue will be considered with recognition of the following:

- there are no informal settlements as they are recognised in international terminology in the country (the term "territories obtained by self-seizure" can be used, but they are later subject to official consolidation);
- all land in Tajikistan belongs to the state.

As the land belongs to the state and the population possess only the right to use, the process of population resettlement is conceptually simpler than in countries where land is privately owned. Chapter 5 of the Land Code of the Republic of Tajikistan outlines mechanisms for the suspension of land use rights in the case of their acquisition, and compensation of losses to land users connected to withdrawal of land from the turnover. Withdrawal of land for state or public needs (under Article 38 of the Land Code) is only actioned in the absence of other options for location of certain objects and in exceptional cases for the purpose of:

1) fulfilment of the international obligation of the Republic of Tajikistan, ratified in the prescribed manner;
2) the creation of new settlements, the expansion of cities and towns;
3) placements of the following objects:
4) defence and security facilities;
5) objects of transport infrastructure: highways, streets, bridges, tunnels, overpasses, and other transport engineering structures, communication facilities;
6) facilities for electricity, gas, heat and water supply, and facilities for wastewater disposal;
7) schools, libraries, hospitals, cemeteries, parks, sports and playgrounds and other social requirements, government buildings serving government and public purposes;
8) discovery of mineral deposits;

77. Decree of the GoT No.648 of November 28, 2020 On the Medium-Term Plan for Organized Resettlement of Environmental Migrants for 2021-2023. Available here.

9) protection of monuments and objects of archaeological, historical, or scientific value in cases where they may be subject to the threat of disappearance or destruction.

Grounds for making decisions on the seizure of a land plot for state or public needs are explicated in town planning documentation approved in the prescribed manner, and further necessary documents substantiating the requirement and the technical and economic calculations used to justify the seizure. According to the Land Code, a decision on the seizure of land plots for state or public needs is made by the local executive body of state power of districts, cities, regions and the Government of the Republic of Tajikistan, and the land user must be notified in writing by such a local executive body no later than a year before the forthcoming seizure. Withdrawal of land plots from users for state or public needs, under Article 41 of the Land Code, can be carried out after:

- allocation, at their request, of an equivalent land plot;
- new construction of residential, industrial, and other buildings, similar in purpose and equivalent in return for the withdrawn property, by individuals and legal entities for which a land plot is allocated, in accordance with established procedure. If such construction is not possible, equivalent value should be paid in cash;
- full compensation for all other losses, including lost profits, in accordance with the legislation of the Republic of Tajikistan.

This land model implies that citizens can be resettled by the authorities at any time, if necessary. This creates insecurity, which is addressed in the LCCT. Under the recommendations of the LCCT, legal frameworks should, as far as possible, prevent instances of forced evictions with security of tenure for all. However, forced evictions are common practice in Tajikistan. Although a citizen has the right to apply to the court with a claim to challenge a decision of land seizure, there are no specialised courts in the country for eviction processes or similar cases. Nor are there alternative forms of dispute resolution (reconciliation, mediation, arbitration and traditional dispute resolution mechanisms).

4.7. DEVELOPMENTAPPROVALANDADAPTATION

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
28.12.2012	Town Planning Code

In Tajik legislation, guidance on the nature and extent of land development is provided under Article 66 of the TPC. To obtain permission to commence construction work, reconstruction, or capital construction, a person applies to the local authorities of architecture and urban planning with copies of the following documents:

- decisions of the local executive body of state power (with the exception of the districts of the city of Dushanbe) on the construction of buildings and structures;
- a document of title for the use of a land plot (certificate for the right to use land);
- approved project document;
- a positive conclusion from the examination of project documentation;
- conclusions from the state ecological expertise.

However, it must be acknowledged that as the legislation on climate change mitigation is limited, not all items recommended as mandatory in the LCCT will apply in the process of building permit issuance. This means that important adaptation measures are not considered when issuing building permits. Moreover, dictating the requirement of documents further than those indicated above is prohibited under the legislation of the Republic of Tajikistan.

4.8. RECOMMENDATIONS

The items outlined in this section are some of the most important areas to address if matters of climate change are to be integrated into urban planning processes. Mainstreaming Climate Change Adaptation into priority sector agency planning and regulatory frameworks is therefore, an overarching general recommendation.

Recommendation 1: Proper consideration of climate risks and vulnerability for planned areas. Though climate risk and vulnerability are, in part, enshrined in Tajik legislation, there is still room for improvement in the methods and processes for assessment. Current legislation does not include methods and processes to conduct risk and vulnerability assessments that would identify potential climate hazards, stakeholders, people, property, and economic sectors exposed to risks. In addition, though the requirement for hazard maps is outlined in the legislation, these need to be made publicly available for communities to use and the legislation should include stipulations on their regular review to ensure they remain current.

Recommendation 2: Both the Second and third recommendations are based on the requirement for identification, prioritisation and implementation of adaptation measures against the risks of climate change in the early stages of urban planning. This is crucial to Tajikistan as a highly vulnerable state. The second recommendation, therefore, is the creation of a base list of potential adaptation options (e.g. creation of setbacks, land buffers) that can be chosen for each specific urban context according to further assessment and prioritisation.

Recommendation 3: Stipulations should be included in urban development legislation requiring urban plans to include accessible and functional evacuation routes and identify safe locations that can be used for settlement development.

Recommendation 4: Processes of resettlement are governed in Tajik legislation but require strengthening with clearly identified provisions of land that will remain safe from current and future climate hazards and mandates for inclusive consultation with the affected resettled and host communities in the event of relocations. Addressing these points will prevent migrated populations from returning to hazardous sites.

Recommendation 5: Ensure security of tenure to those who might be affected by planned relocations. Currently, the land system in Tajikistan provides the state with monopoly ownership, and citizenry rights to land extend only to that of exclusive use, facilitating the ease of relocation. Alternative dispute resolution mechanisms for land and property matters such as customary institutions, negotiation, mediation, and arbitration are recommended to strengthen the rights of resettled citizens.

Fig 15. Vehicule bridge in the central area of Khorog, May 2021

4.9. LCCT CHECKLIST 3: ADAPTATION PLANNING

	Category	Present/Absent
Climate risks and vulnerability for planned areas and infrastructure	Does your country have provisions of law or regulations that require the consideration of climate risks and vulnerability for planned areas and infrastructure?	☑
	Do these include the requirement to produce climate risk and vulnerability assessments to assess current and estimated future vulnerabilities and risks as part of the urban planning process?	☑
	Do these include legal requirements concerning methods and processes to conduct risk and vulnerability assessments?	☒
	Do these include the requirement to conduct inclusive and participatory vulnerability assessments?	☒
	Do these include a list of potential climate hazards that need to be identified in the risk and vulnerability assessments?	☒
	Do these include a legal requirement to identify the places where climate hazards are most likely to occur through climate hazard maps?	☑
	Do these include the requirement to identify people, property and economic sectors exposed to risks arising from climate change?	☒
	Do these include the requirement for hazard maps to be publicly accessible?	☒
	Do these include the requirement that hazard maps need to be reviewed at least every 10 years?	☒
	Do these include the legal requirement to assess the climate vulnerability of urban plans and infrastructure through environmental impact assessments or strategic impact assessments?	☒
Identification and prioritisation of adaptation options	Does your country have provisions of law or regulations on how to identify and prioritize adaptation options for the risks and vulnerabilities identified?	☒
	Do these include the requirement to determine available adaptation options for the identified risks and to describe them in detail?	☒
	Do these include the requirement to assess the identified adaptation options based on time, cost, benefits and barriers to implementation?	☒
	Do these include the requirement to prioritise the adaptation options and select the preferred ones?	☒
	Do these include the legal requirement for stakeholders' engagement in the process of identification and prioritisation of the adaptation options?	☒
	Do these include the legal requirement to identify both infrastructure-based and ecosystem-based adaptation measures?	☒
	Do these include the legal requirement to have targets to improve the adaptation of urban areas with measurable and verifiable benchmarks against which progress can be assessed?	☒
	Do these include provisions that require the assessment of the urban plan's ability to meet the local, sub-regional and national governments' climate change strategies, adaptations targets and measures?	☒

Implementation of the identified adaptation options	Does your country have provisions of law or regulations with mechanisms to implement the adaptation options identified for planned areas and infrastructure?	☒
	Do these provide for total and partial restrictions on land use and development in hazard prone areas?	☑
	Do these include the provision for a public land buffer between sea and rivers, and land?	☒
	Do these include the requirement to establish riparian setbacks with width based on scientific assessments and projections?	☒
	Do these include the requirement to establish coastal setbacks with width based on scientific assessments and projections?	☒
	Do these include the requirement to develop integrated coastal zone management plans that integrate climate change adaptation considerations?	☒
	Do these include the legal requirement to plan the location of essential infrastructure out of flood prone high-risk areas?	☒
	Do these include the legal requirement to consider nature-based storm water management to manage increasing volumes of storm water in already built-up and expansion areas?	☒
	Do these include provisions that allow the land information system to integrate vulnerabilities and exposure of land parcels to climate hazards?	☒
	Do these include the legal requirement to plan for evacuation routes and identify locations for low risk safety areas in case of extreme weather events?	☒
Adaptation of slums and other vulnerable settlements	Does your country have provisions of law or regulations to support the adaptation of slums and other settlements vulnerable to the effects of climate change?	NA
	Do these include urban planning and land management tools for urban expansion, infill and redevelopment to change the shape and configuration of plots?	NA
	Do these include differentiated and flexible planning and infrastructure standards for slums and other vulnerable settlements?	NA
	Do these include mechanisms to ensure the participation of all owners and residents of slums and other vulnerable settlements in the process of upgrading with special consideration to women, youth, disabled and elderly people?	NA
	Do these include the requirement to conduct community-led surveys, maps and household enumerations to facilitate the adaptation of slums and other vulnerable settlements?	NA
	Do these include provisions that ensure the accessibility of water, sanitation and electricity services based on the provision of customary and non-documentary forms in addition to formal tenure rights documents?	NA
	Do these include the legal requirement to maintain the affordability of the upgraded settlement for the pre-existing community and prevent its economic displacement?	NA

Planned relocations from areas at risk of climate change	Does your country have provisions of law or regulations that support the relocation of populations from areas at risk of the effects of climate change to ensure their safety and health after all reasonable on site alternatives and solutions have first been explored?	☑
	Do these include the legal requirement to identify and, if necessary, set aside land for relocation in case of extreme weather events?	☑
	Do these include the requirement that the resettlement land need to be safe from current and future climate hazards?	☒
	Do these include a process for planned relocations with inclusive consultation and engagement with the affected resettled and host communities?	☒
	Is there a legal requirement to provide the relocation site before occupation with livelihood opportunities, water and food security, sanitation, education and health facilities?	☑
Security of tenure	Does your country have provisions of law or regulations that ensure the security of tenure of people living in slums and other settlements vulnerable to the effect of climate change or whose tenure security might be affected by planned relocations?	☒
	Do these include the legal recognition of a variety of tenure forms including customary rights, informal tenure rights and occupation?	☒
	Do these include the process to regularize informal land and property rights?	☒
	Do these include provisions that allow a variety of tenure forms, including customary rights, informal tenure rights and occupation, to be recorded in the official land information system?	☒
	Do these include provisions of law or regulations on how evictions and relocations should be conducted?	☑
	Do these include provisions for land acquisition that consider and compensate loss of formal rights, informal rights and interests and livelihoods for slum dwellers and resettled and host communities?	☒
	Do laws or regulations provide access to formal grievance, review, dispute resolution and redress mechanisms for land and property disputes for people whose tenure security might be affected by the adaptation of slums, vulnerable settlements and planned relocations?	☒
	Do these include alternative dispute resolution mechanisms for land and property disputes such as customary institutions, negotiation, mediation and arbitration?	☒

Development approval and adaptation	Does your country have provisions of law or regulations to ensure that planning and design standards for adaptation to climate risks and vulnerabilities are implemented, monitored and enforced through the development approval process?	☑
	Do these include provisions that link the development approval process to legally approved urban plans, zoning regulations and evidence from climate risk and vulnerability assessments?	☒
	Do these include provisions that allow governments to charge developers, either in cash or in kind through conditions to be attached to the approval of planning applications, for infrastructure costs associated with their developments?	☒
	Do these include mechanisms to monitor compliance with the approved development and its conditions?	☒
	Do these include mechanisms for enforcement in the event developments are not compliant with the submitted application and its conditions?	☒

Table 6. LCCT checklist 3.

Fig 16. Residential building from the Soviet times, May 2021

5

PLANNING FOR MITIGATION

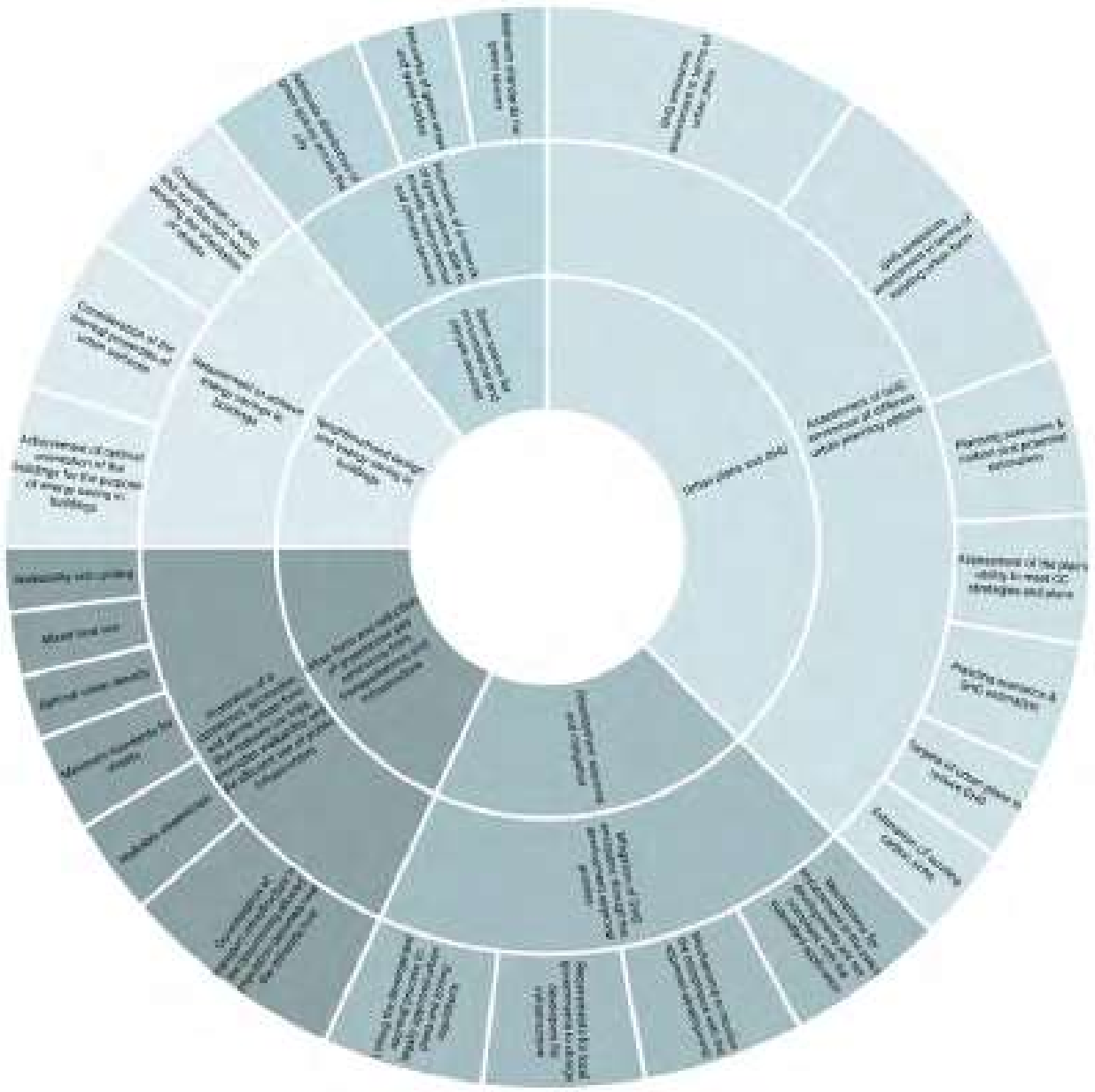


Fig 17. Planning for Mitigation diagram

This section will focus on the integration of climate change mitigation into urban and territorial development planning processes. Mitigation can refer to lowering greenhouse gas emissions, climate-effective spatial design, low carbon buildings and construction, services and infrastructure, and nature-based solutions. The analysis here was conducted on the norms of primary and secondary national legislation, as well as on links to international regulations.

5.1. URBAN PLANS AND GREENHOUSE GAS EMISSIONS

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
06.06.2003	National Action Plan for Climate Change Mitigation approved by Decree of the GoT No.259
02.10.2019	National Strategy for Adaptation to Change Climate of the Republic of Tajikistan for the period up to 2030 approved by Decree of the GoT No.482
International docs analysed in this section:	
2002	First NC
2008	Second NC
2014	Third NC
2015	INDC
2018	First Biennial Report of the Republic of Tajikistan

All countries in the CIS region have ratified the Kyoto Protocol and have national policies and regulations on greenhouse gas emissions and absorption. However, national data collection, monitoring and reporting systems for greenhouse gas emissions in CIS countries are underdeveloped, leading to discrepancies in figures.[78] Publications from international organisations reflect higher emission rates than official national figures.[79] These differences can arise from different accounting methods and a lack of legislative uniformity in this area.

The numbers for Tajikistan presented by the World Bank and included in the draft INDC state that the volume of greenhouse gas emissions is 1.9 tons of CO2 per capita (0.0003 per cent of global contribution).[80] This figure places the country at an output rank of 160th among 200 countries.[81] GHG emissions in Tajikistan is also the lowest in Central Asia.[82] This is likely due to the fact that 95 per cent of all electricity generated in the country is generated by hydropower meaning that consumption of fossil fuels is low. As of 2003, according to the information in the NAPCC, the majority of CO2 emissions in Tajikistan come from:

- Fossil fuel combustion in industry, transport and residential sectors (82-92%);
- Production of cement, lime, aluminium, ferrous metals and ammonia (8-18%)[83]

In a draft version of the Intended Nationally Determined Contribution of Tajikistan a new GHG inventory was outlined with five main sectors identified in the calculations as priority for mitigating actions, namely: energy, industry and construction, agriculture, transport and forestry, and biodiversity.[84]

General regulation on the inventory of greenhouse gases in Tajikistan is structured in accordance with the UNFCCC, Kyoto Protocol and Paris Agreement (differences lie in the approaches to GHG limitation rather than the objectives). The global goal to reduce total emissions was determined by these agreements, and on this basis, each country determined their

78. p.15 of the CIS Cities: Towards Sustainable Future. The Commonwealth of Independent States. Regional report for the United Nations Conference on Housing and Sustainable Urban Development, Habitat III.
79. Emissions in Tajikistan: small but growing by Timur Idrisov from the Environmental organization "Little Earth".
80. Chapter 7. Trends in Tajikistan's sustainable infrastructure investments. OECD Library.
81. Environmental Performance Reviews of Tajikistan. Third review. Abridged version of 2017.
82. p.9 of Analytical review on the participation of the CIS member states in the Paris Agreement on Climate adopted under the UNFCCC.
83. p.12 of the NAPCC.
84. p.33 of the draft Intended Nationally Determined Contribution of Tajikistan.

own specific target emission levels. To achieve these targets, an outcome is generated from nationally determined contributions,[85] on which Tajikistan has submitted three NCs and the First Biennial Report. On the national level, GHG emissions are addressed in the National Action Plan for Climate Change Mitigation and the National Climate Change Adaptation Strategy:

Year	Document	Content related to GHG
2002	First NC	Focused on trends in greenhouse gas emissions, and vulnerability of the environment, national economy and human health.
2003	NAPCC	Defined total greenhouse gas emissions in Tajikistan, by key sources and category.
2008	Second NC	Focused on GHG inventory, major sources, dynamics, ways of reduction.
2014	Third NC	Included GHG inventory for the period from 1990 to 2010.
2015	INDC under the Paris Agreement	Determined a flexible target, not to exceed 80-90% of the 1990 level by 2030. This amounts to 1.7-2.2 tonnes in CO2 equivalent per capita as the country's contribution to anthropogenic GHG reductions.[86]
2018	The First Biennial Report on inventory of Greenhouse Gases under the UNFCCC	Fully open GHG inventory in energy, industrial processes and product use, agriculture, land use, land use changes, forestry, and waste.
2019	National Climate Change Adaptation Strategy	Enshrined Tajikistan's desire to reduce greenhouse gas emissions by 65%-75%, which will amount to 1.2-1.7 tons in CO2 equivalent per capita by 2030. This will be achieved through investment projects and national programmes in the field of energy, transport, agriculture, forestry economy, water management, disaster risk reduction, promotion and diversification of renewable energy sources, reduction of energy losses, modernisation and new technologies.[87]

Table 7. Content related to GHG in the National Action Plan for Climate Change Mitigation and the National Climate Change Adaptation Strategy:

The legislative structures that govern mitigation of greenhouse gas emissions and urban planning exist in parallel in Tajikistan and do not overlap. This could be explained by the low rates of GHG emissions in the country, or that measurement obligations exist only at the level of international treaties. Without strengthening the national and local links to such general agreements, there is limited recourse to link them with concrete parameters in urban planning. This gap is clear upon comparison with the LCCT guidelines.

5.2. URBAN FORM AND REDUCTION OF GREENHOUSE GAS EMISSIONS FROM TRANSPORTATION AND INFRASTRUCTURE

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
30.01.2018	GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements"

Though aspects of greenhouse gas regulation and reduction are not widely covered in the legislation of Tajikistan, especially in regards to urban planning, thereare provisions still promote their decrease. There are approaches to reduction in transportation and infrastructure which have connotations for urban planning. These include implementing standards in **density, land use mix, connectivity**, and accessibility. According to paragraph 25 of GNiP 30-01-2018, "Urban Planning. Planning and Development of Urban Settlements", planning structures for settlements should provide:

- optimal placement and interconnection of functional areas;
- rational structuring of territories in conjunction with the system of public centres, engineering and transport infrastructure;
- varied types of urban environment that meet the needs of different groups of the population;
- effective use of the territory;
- consideration of architectural and urban planning traditions, and conditions of natural, climatic and other natures;

85. .4 of Analytical review on the participation of the CIS member states in the Paris Agreement on Climate adopted under the UNFCCC.
86. p.1 of the Intended Nationally Determined Contribution (INDC) towards the achievement of the global goal of the UN Framework Convention on Climate Change (UNFCCC) by the Republic of Tajikistan.
87. paragraph 19 of the National Climate Change Adaptation Strategy.

- protection of the environment, and of historical and cultural monuments.

Standards to reduce GHG emissions in transportation and infrastructure:

Urban density: the UN-Habitat recommended average population density, is at least 15,000 people per km², or 150 people per ha. However, this level of density must be accompanied by sufficient street space and an efficient street network, mixed land use and mixed social composition with diverse housing options. In Tajikistan, the density of residential buildings should be considered in accordance with the established zoning of the territory, the state of the environment, and natural climatic conditions. In GNiP 2018 it is outklined that the estimated population density for a group of residential buildings, quarters and micro-districts in Tajikistan should not exceed 400 people/ha (in Dushanbe this figure can be raised to 600 people/ha).[88]

Mixed land use: this is a crucial component to ensure equal dispersal of varied activities but also to ensure personal safety. Different uses have different peak hours, meaning that a variety of activities keeps local streets active throughout the day.[89] The location of e.g. a business center, market, social or state institutions allows the street to be active at different times and thus ensuring the safety of passers-by at different times. In Tajikistan this is provided under paragraph 69 of GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements" and is formed on the existing territories of large cities and consists of residential and industrial buildings. The following objects are permitted in territories of mixed development: residential and public buildings, scientific institutions, educational institutions, business facilities, industrial enterprises and other production facilities (the area of the site, as a rule, no more than 5 hectares) with non-fire-hazardous and non-explosive production processes; so long as they do not create noise, vibration, electromagnetic and ionising radiation, pollution of atmospheric air, surface and underground waters exceeding the established standards; not requiring the utilisation of sanitary protection zones with a width of more than 50m, railway access lines, and not generating a large flow of trucks (no more than 50 vehicles per day).

Connectivity: this is outlined under paragraph 3, chapter 11 of GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements", and annexes 23-25 which refer to networks of streets and roads. According to this document, streets are split into two types, (main and local) containing eleven subcategories:

Categories of streets and roads	Width of streets and roads, m
Main streets and roads	
Roads and streets of continuous movement	70-100
Streets of city-wide significance	50-80
Streets of regional significance	30-60
Central cities of medium and small towns	30-60
Main streets of villages and rural settlements	25-30
City roads	right-of-way – as calculated
Local streets and roads	
Streets of production and communal storage areas	25-40
Main residential streets	20-30
Minor residential streets	15-20
Driveways	1-2 lanes

Table 8. Categories of streets and roads

88. paragraph 61 of GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements"
89. p.48 of the Streets for walking & cycling. Designing for safety, accessibility, and comfort in African cities.

The pedestrian zone of streets should provide continuous clear space for walking. Street design parameters differ for roads and streets in cities and

rural settlements. For example, the width of the pedestrian zone of the sidewalk in local city roads and streets should be 1.5m while in rural settlements, the specified width is 1.0-1.5m. By UN-Habitat standards, the clear width must be at least 2m in residential zones to accommodate two wheelchair users at the same time and must be entirely free of obstructions.[90] Bicycle paths are permitted in Tajik legislation along the carriageway edge of streets and roads when marked with a double line. The lane width must be at least 1.2m when facing in the same direction of the traffic flow and at least 1.5m when facing into oncoming traffic. The width of the cycle lane on a sidewalk must be at least 1m.[91]

As transportation has been identified as a main contributor of GHG emissions in the country, it is given attention in urban planning through building codes, which establish some basic values for certain actions.

5.3. GREEN SPACES FOR ENVIRONMENTAL AND CLIMATE SERVICES

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
30.01.2018	GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements"

"Green space" is a widely used concept by a great number of research institutions and international organisations. Each definition is influenced directly by the scope of work in the organisation or institution. For example, European Urban Atlas defines such spaces as "green urban areas", identified as public green spaces used predominantly for recreation, such as gardens, zoos, parks, castle parks and cemeteries.[92] EnviroAtlas of the U.S. Environmental Protection Agency expands this definition to includes trees, lawns and gardens, crop land, and wetland.[93] The health and human wellbeing focus of the WHO means that it emphasises the health benefits of urban green spaces which are defined as inclusive of public parks, private gardens, woodlands, children's play areas, non-amenity areas, riverside footpaths, beaches etc.[94] It stipulates a normative area of 9m2 of green space per city dweller. The UN-Habitat term for these areas is "public open spaces", defined as inclusive of parks, gardens, playgrounds, public beaches, riverbanks and waterfronts opened for public use.[95]

This demonstrates that the inter-institutional definition of "green-spaces" is, to an extent, context-based. However, their overarching purposes are generally agreed as to provide cooling effects to stabilise both micro and macro-climates, retain areas for water absorption which assists in mitigation of natural hazards such as floods, and provide opportunities for socialising. Sustainable Development Goal 11, Target 7 states that it is key to provide universal access to safe, inclusive and accessible green and public spaces, in particular for women and children, older persons, and persons with disabilities.[96] This goal is 86 per cent integrated into the strategic development documents of Tajikistan.[97] Traditionally, urban settlements in the country benefit from a fairly large amount of green areas – parks, squares, alleys and gardens on adjacent land plots. The area of green space reaches up to approximately 30 per cent of the total area of large cities.[98] Paragraph 137 of GNiP 30-01-2018, "Urban Planning. Planning and Development of Urban Settlements", defines three types of green area in Tajikistan: of general use, of limited use and for special purposes:

90. p.12 of the Streets for walking & cycling. Designing for safety, accessibility, and comfort in African cities.
91. paragraph 192 of GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements".
92. p.24 of the Mapping Guide for a European Urban Atlas.
93. p.1 of the EnviroAtlas. Fact sheet.
94. p.13 of the Urban green spaces and health. A review of evidence.
95. p.37 of the Global Public Space Toolkit From Global Principles to Local Policies and Practice.
96. UN-Habitat. Public spaces for all.
97. p.17 of the National Report on Implementation of Strategic Documents of the Country in the Context of the Sustainable Development Goals.
98. p.18 of the Environmental Performance Reviews. Tajikistan. Third review. Abridged version.

of General use	of Limited use	for Special purposes
• multifunctional and specialised parks; • squares; • boulevards; • embankments; • forest and meadow park areas; • zones of short-term recreation near the water; • green areas of public centres of the city-wide and district levels.	• green areas in residential buildings for everyday recreation of the population; • plantings on individual building sites, and green recreation areas of industrial and mixed development areas; • plantings on the territory of research, educational, medical, administrative, cultural and educational, and sports facilities, intended for a limited contingent of visitors;	• decorative nurseries; • plantings on sanitary protection zones of enterprises, noise protection, wind protection, and coastal protection strips; • cemeteries.

Table 9. Uses of green spaces.

After declaration of independence, green spaces were first addressed at the legislative level in the building code SNiP MKS ChT 30-01-2007 "Urban Development, Planning and Construction of Settlements".[99] This was later superseded by building code GNiP RT 30-01-2015 "Urban planning. Planning and Development of Urban Settlements" and again, by GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements". According to these documents the standard for the proportion of greenery to the built-up areas of settlements must be at least 40 per cent and no less than 25 per cent within the borders of the housing or mixed use territories. The new building code also regulates the area of the green space for micro-districts, which must be at least 6m2/person. There is the possibility either to expand or reduce the area of green spaces in small towns or rural settlements by 15 to 30 per cent in cases where sanitary protection zones are established or forests are present.

Depending on the type of urban settlement, Annex 18 to GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements", defines differing requirements on green space provisions of the aforementioned categories:

Type of settlement	Provisioning, m2/person			
	green areas in residential area	green areas of common use		recreational areas in the green zone of the settlement
		district	city	
Urban settlement: large big medium small	 10-11 12-15 15-20 20-30	 7-9 6-8 3-5	 8-10 8-10 6-8 8-12	 200 150 100 70
Rural settlement	-	-	12-15	-

Table 10. Uses of green spaces.

Green spaces play quite an important role in inclusivity and climate resilience. They are multifunctional areas for social interaction, human health and well-being, cultural expression, and dialogue. Green spaces also provide nature-based mitigation and adaptation benefits, as they act as carbon sinks and absorb surface water run-off. As a result of the latter, connecting green areas and water bodies is essential for climate change mitigation. Paragraph 140 of GNiP 2018 outlines specifications for the formation of green-water systems as requiring a width of 0.5 to 0.7km in the central zone, 1.5 to 2.0 km in the peripheral zone of large settlements, and 0.2 to 0.5 km in large and medium-sized settlements.

It is necessary to indicate that the issue of urban greening is given a lot of attention in Tajikistan. For example, special attention is paid to planting poplars along highways, which contribute to the absorption of CO2. This practice is carried out by local authorities in Khorog, where trees have been planted along the busy artery of Lenin Street.

99. SNiP MKS ChT 30-01-2007 "Urban Development, Planning and Construction of Settlements construction. Available here.

5.4. NEIGHBOURHOOD DESIGN AND ENERGY SAVING IN BUILDINGS

As a mountainous country with specific natural and climatic features, it is important to ensure the protection of buildings from overheating in the summer and cold in winter, to create comfortable living conditions in premises while reducing energy consumption in the design, construction and operation of buildings.[100] To address this, the Annex to the 2003 NAPCC provided a list of measures to reduce greenhouse gas emissions and improve the state of natural carbon sinks. It further provided outline approaches to the planning, design, and construction of residential and industrial (commercial) buildings. These included guidance on the composition and orientation of buildings with respect to land surface occupation, sunlight and wind direction to enhance comfort for inhabitants and save energy saving.[101]

Since that time Tajikistan, which traditionally has low domestic energy prices, has significantly increased mandatory energy efficiency requirements, especially for new construction.[102] In 2013 the Law on Energy Saving and Energy Efficiency[103] was adopted with a view to create a legal and institutional framework for this action and to promote the introduction of energy efficient materials, devices, and technologies. Article 9 sets out requirements to ensure the energy efficiency of buildings and constructions in relative values of energy consumption. This law covers all sectors relevant to energy use (construction, residential, industry, etc.) but is of a general, declarative nature, and is absent of by-laws and mechanisms for implementation. The law outlines the requirement for 16 normative by-laws (to be determined by the Government of the Republic of Tajikistan), 10 of which relate to the construction sector, but to date, none have been developed.[104] As a result, the outlines on building orientation and street-layout to optimise comfort and energy efficiency in buildings remain without legislative support.

As of now, legislation of the Republic of Tajikistan in the field of energy efficiency consists of:

- the abovementioned 2013 Law on Energy Saving and Energy Efficiency, GoT Decree of January 27, 2015 on the determination of the authorised state body in the field of energy saving and energy efficiency
- building codes and regulations
- MKS ChT 23-02-2009 "Thermal protection of buildings"
- normative technical documents and legal acts
- international treaties

The building codes establish the requirements for sanitary and hygienic conditions, durability of enclosing structures, and energy saving protocols in buildings such as thermal protection. The norms establish three indicators of thermal protection in a building:

- resistance to heat transfer in individual elements of the building envelope;
- the temperature difference between internal air and the internal surface of the enclosing structures;
- specific levels of thermal energy consumption for heating and cooling a building, for which the heat-shielding property values of building envelopes are considered against the choice of climate maintenance system to achieve a standardised indicator value.

The Technical Committee for "Energy saving and energy management", which was established as part of Tajikstandard Agency in 2012, is currently developing standards (based on those existing in Europe and Russia) in the area of building performance, energy-intensive products, and renewable energy.[105] However, the implementation of these standards is partially hampered by the 2010 Law on Standardisation, which stipulates that the application of standards should be voluntary. Certain standards will only become mandatory if specific technical regulations refer to them.

100. Akbarov Akram. Ensuring energy efficiency in the design of residential buildings in Tajikistan, as a mountainous country with specific natural and climatic conditions.
101. p.193 of the NAPCC.
102. p.40 of the Compendium of best practices on standards and technologies for energy efficiency in buildings in the UNECE region
103. Law On Energy Saving and Energy Efficiency.
104. p.31 of the National Action Plan for the Implementation of the Recommendations of the National Review of Housing and Land Use in the Republic of Tajikistan.
105. p.120 of the National Report on the Development of Human Settlements of the Republic of Tajikistan for the UN World Conference on Human Settlements HABITAT III.

5.5. DEVELOPMENT APPROVAL AND MITIGATION

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
30.01.2018	GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements"
28.12.2012	Town Planning Code

General regulation on the development approval process in Tajikistan is enshrined in MKS ChT 11-01-2005, "Composition and procedure for the development, coordination and approval of project documentation for the construction of enterprises, buildings and structures", and Chapter 9 of the TPC. The latter outlines requirements for the preparation and approval of design documentation and permissions to commence construction works.

In general, the construction of buildings, structures, their complexes and components, objects of social, industrial, transport, engineering infrastructure and landscaping, require design documentation to commence construction, to be produced at the initiative and expense of the customer.

According to paragraph 6.2 of the MKS ChT 11-01-2005, "Composition and procedure for the development, coordination and approval of project documentation for the construction of enterprises, buildings and structures" working project documentation for the construction of housing or civil facilities will consist of the following sections:

- general explanatory note;
- architectural and construction solutions;
- technological solutions;
- solutions for engineering equipment;
- environmental protection mechanisms (if necessary);
- engineering and technical measures to prevent emergencies (if necessary);
- organisational outline of construction;
- financial estimate documentation;
- investment efficiency calculations (if necessary).[106]

A further state examination of the project documentation is carried out, which assesses compliance with sanitary, epidemiological, and environmental requirements, the requirements of state protection of cultural heritage sites, the requirements for fire, industrial, nuclear, radiation and other safety standards. The state examination concludes on the compliance (positive conclusion) or non-compliance (negative conclusion) of the project documentation with the requirements of the legal regulatory acts of the Republic of Tajikistan. A positive conclusion is necessary to obtain a building permit.

After a positive conclusion from state examination of the project documentation, the interested party must apply to the local authorities of architecture and urban planning to obtain a permit for the commencement of construction. Copies of the following documents must be attached to the application:

- decisions of the local executive body of state power on the construction of buildings and structures;
- a document of title for the use of a land plot (certificate for the right to use land);
- approved project document;
- a positive conclusion of the examination of project documentation;
- conclusions of the state ecological expertise.

If the documentation complies with urban planning standards, the authorised state body in the field of architecture and urban planning issues a building permit. In general, the validity of development projects should be accessed on compliance to detailed planning requirements (Article 54 of the TPC).

After construction has commenced, the TPC provides outlines on supervision by the local regulatory body on urban planning, a project technical advisor and the developer in order to ensure compliance with the requirements of legal regulatory acts of the Republic of Tajikistan and project documentation. This supervision applies to the preparation for construction, the process of construction, acceptance of a completed construction project, and extends to the period of operation during the warranty period. The different supervisory parties are assigned the following tasks:

- **state supervision** (carried out by an authorised state body in the field of architecture and urban planning) is tasked with monitoring compliance with the procedures established by the legislation of the Republic of Tajikistan and the General Plan of the settlement on urban planning activities, the development and

106. Paragraph 6.2 of the MKS ChT 11-01-2005 "Composition and Procedure for the development, coordination and approval of project documentation for the construction of enterprises, buildings and structures". Available here.

approval of documentation for the planning of the territory, land use and development rules. They further monitor compliance of material, product and structural uses and processes with the approved design documentation and certificates;
- **technical supervision** (carried by the customer or authorised person);
- **author supervision** (carried out by the developer).

In the event that non-compliance with the requirements of technical regulatory legal acts and technical regulations is revealed during construction, the project may be halted and terminated. Such a decision can be taken either by the Government of the Republic of Tajikistan or an authorised state body for supervision of architecture and urban planning if the case applies to objects of unfinished construction, erected at the expense of the republican budget. The decision can be taken by local executive bodies of state power if the case applies to objects of unfinished construction, erected at the expense of the relevant local budgets (Article 79 of the TPC). However, there is no intermediate obligation to comply with the design documentation in the legislation. Construction can only be cancelled in the event that arguments for its validity to remain have been successfully eliminated. In the event that the validity of the building cannot be successfully challenged, construction can continue.

Despite these efforts to ensure sustainable development and functional physical and social infrastructures that preserve natural resources and heritage, the law does not impose state charges on developers to mitigate the impact of buildings and infrastructure. This means there are no financial obligations for developers to maintain, for example, green areas or to install energy saving facilities in buildings.

To conclude, there are norms in the legislation of Tajikistan to ensure that planning and design standards to mitigate the emission of greenhouse gases are enforced in the development approval process (regulating density, land use mix, connectivity, accessibility, green spaces etc). However, this emphasis on these regulations is more technical and does little to directly prescribe the use of such mechanisms for climate change mitigation. There is also a lack of legislative obligation to limit greenhouse gases during the construction process and, thereby, to include these preventative provisions in the project documentation.

5.6. RECOMMENDATIONS

Recommendation 1: It is necessary to legislate the norms that oblige the measurement of greenhouse gases. This should be an integral part of the urban planning documentation developed for national, regional, and territorial general plans, as well as for detailed urban planning of territories of settlements. The required items of such documentation should also include possible scenarios of certain greenhouse gases impacts on the city, and scenarios through which they can be reduced by setting goals such as those outlined in existing documents (NC, INDC, other reports under the UNFCCC) of the Republic of Tajikistan.

Recommendation 2: Special attention should be paid to carbon sinks and this concept should be legislatively consolidated in the context of greenhouse gas emissions. Green spaces must be contextually linked to carbon sinks, and the obligation to conserve and maintain them must be explicitly enshrined in urban planning legislation. The recommended average area coverage of greenspaces is 9m2 per person. In Tajik legislation this figure is considerably lower, at 6m2 per person. It is recommended that raising the mandatory area of greenspaces to 9m2 per person can be combined with planning measures to protect green spaces as carbon sinks.

Recommendation 3: Energy saving issues are becoming acute in Tajikistan due to rather sharp temperature changes. The government has made great strides in this area by creating primary legislation. However, urban planning bylaws are recommended to regulate energy expenditure in construction. This should stipulate that street and plot layout and building orientation be based on wind and sun direction calculations and set range limits on the thermal properties of surfaces. These actions will assist in the reduction of energy expenditure and GHG emissions that contribute to climate change.

Recommendation 4: It is recommended that developers be directly obligated to maintain green areas and install of energy saving facilities. These items should be further included in the framework of required documentation for construction projects.

5.7. LCCT CHECKLIST 4: MITIGATION PLANNING

	Category	Present/ Absent
Urban plans and greenhouse gas emissions	Does your country have provisions of law or regulations that require assessment of the greenhouse gas emissions of different urban planning options?	☒
	Do these include provisions that require the assessment of the greenhouse gas emissions associated with the existing urban form?	☒
	Do these include provisions that require the estimation of existing carbon sinks?	☒
	Do these include provisions that require the production of different planning scenarios and the estimations of the greenhouse gas emissions associated with each scenario?	☒
	Do these include provisions that require the production of different planning scenarios and the estimation of the carbon sink potential associated with each scenario?	☒
	Do these include provisions that require the assessment of the plan's ability to meet the local, sub-regional and national governments' climate change strategies and plans, greenhouse gas reduction targets and measures?	☒
	Do these include the legal requirement for urban plans to have targets to reduce greenhouse gases with measurable and verifiable benchmarks against which progress can be assessed?	☒
	Do these include the legal requirement to assess the greenhouse gas emissions associated with the urban plans?	☒
Urban form and reduction of greenhouse gas emissions from transportations and infrastructure	Does your country have provisions of law or regulations that promote a connected, accessible, and dense urban form that reduces car trips, promotes walkability and the efficient use of public infrastructure?	☑
	Do these include provisions of law or regulations that promote connectivity establishing minimum standards for streets?	☑
	Do these include provisions that promote connectivity through street design standards for walkability and cycling?	☑
	Do these include provisions that promote connectivity through plot design rules for a walkable streetscape?	
	Do these include provisions to promote accessibility to jobs, housing, services, and shopping by promoting mixed land use?	☑
	Do these include provisions that promote optimal urban density?	☑
	Do these include provisions that require the consideration of existing and planned transport infrastructure in the determining allowed population densities near the infrastructure?	☑
Green spaces for environmental and climate services	Does your country have provisions of law or regulations that promote a network of green spaces able to provide environmental and climate services?	☑
	Do these include provisions of law or regulations that establish minimum standards for green spaces?	☑
	Do these include provisions of law or regulations that require the adequate distribution of green spaces across the city?	☑
	Do these include provisions of law or regulations that require connecting and planning together networks of green areas and water bodies?	☑

Neighbourhood design and energy saving in buildings	Does your country have provisions of law or regulations that require neighbourhood design principles to achieve energy savings in buildings	☑
	Do these include provisions of law or regulations that require neighbourhood plans to consider wind and sun direction when deciding the orientation and the layout of streets?	☒
	Do these include provisions of law or regulations that require the consideration of the thermal properties of urban surfaces?	☒
	Do these include provisions of law or regulations that require plot design to achieve optimal orientation of the buildings for the purpose of energy saving in buildings?	☒
Development approval and mitigation	Does your country have provisions of law or regulations to ensure that planning and design standards that mitigate the emissions of greenhouse gases are enforced through the development approval process?	☑
	Do these include provisions that link the development approval process to legally approved urban plans and zoning regulations?	☑
	Do these include provisions that allow local governments to charge developers, either in cash or in kind through conditions to be attached to the approval of planning applications, for infrastructure costs associated with their developments?	☒
	Do these include mechanisms to monitor the compliance with the approved development and its conditions?	☑
	Do these include mechanisms for enforcement in the event developments are not compliant with the submitted application and its conditions?	☑

Table 11. LCCT checklist 4.

Fig 18. Construction along the river, May 2021

6

ECONOMIC AND FINANCIAL INSTRUMENTS

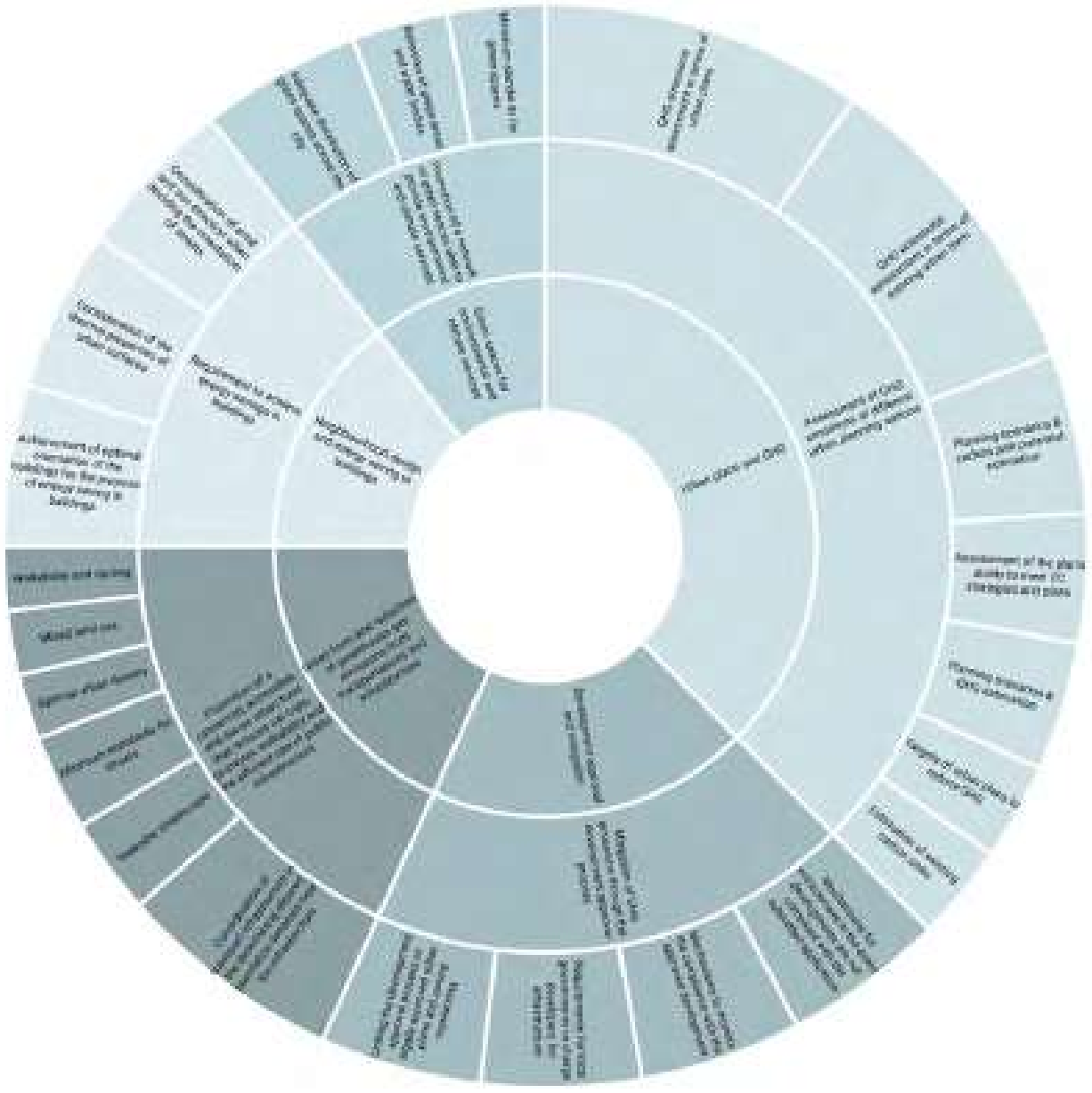


Fig 19. Economic and Financial Instruments diagram

6.1. RESOURCES FOR URBAN PLANNING AND CLIMATE CHANGE

Legislative acts (primary and secondary) analysed in this section:	
Date	**Title**
30.01.2018	GNiP 30-01-2018 "Urban Planning. Planning and Development of Urban Settlements"
06.11.1999	Constitution
28.06.2011	Law of the Republic of Tajikistan on Public Finances
17.09.2012	Tax Code
28.12.2012	Law on Public-Private Partnership
02.10. 2019	National Strategy for Adaptation to Climate Change to 2030 by GoT Decree No. 482

The Law of the Republic of Tajikistan on Public Finances of the Republic of Tajikistan, applies two levels to the state budget system of the Republic of Tajikistan:

- level 1– the republican budget and budgets of state trust funds;
- level 2 - local budgets.

Local budgets include the budgets of GBAO and its cities and districts, regions, cities and districts of regional subordination, the city of Dushanbe and its districts, cities and districts of republican subordination of village jamoats.[107] Sub-national governments have significant control over revenue and expenditure. Article 77 of the Constitution grants local governments the right to formulate and execute their own budgets and establish local payments, taxes and duties "in accordance with the law". Local government bodies receive significant revenues through the budget revenue distribution mechanism. The distribution of national taxes between the republican budget and local budgets is managed by the Government of the Republic of Tajikistan and is reviewed before the commencement of each financial year for compliance with the Law of the Republic of Tajikistan on the State Budget.

Local taxes can be levied on vehicles and real estate. Vehicle taxes are levied on engine power and range from 1 to 14.5 per cent. Land tax is levied on land plots at rates established by local authorities, those on real estate objects range from 3 to 25 per cent, depending on the type of object, its land area and location.[108] Article 262 of the Tax Code, stipulates that local Majlises of People's Deputies cannot, within the limits of local tax rates provided for by the Code, differentiate the rates for different categories of taxpayers and (or) objects of taxation, nor can they exclude certain categories of persons from taxpayers and (or) exclude certain elements from the tax base.

The general stipulations for local tax collection are the following:

1) Majlises of people's deputies of cities (regions) establish local taxes on their territory, in accordance with Article 6 of the Tax Code;
2) Decisions of Majlises of people's deputies of cities (regions) on local taxes must comply with the provisions of the Tax Code and will be officially published in publicly available periodicals in the relevant territory.

Local authorities rarely increase tax collection. Annual changes to tax types and percentages make predicting local budget revenue bases to strategies for the coming, and even more so for medium and long terms. Therefore, this practice does not facilitate the mobilisation of revenues for local budgets and the burden of budget regulation is to a greater extent placed on transfers from the higher level.[109]

To provide an example, a local khukumat district, in accordance with its rights, independently determines the procedure for the formation and use of budgets, delimiting income sources and types of expenses that will require use of republic budgets, excluding income received in regulation procedure. Regional government units approve long-term, stable standards of budgetary allocations. They solve issues of the territorial planning such as farmland organisation and the placement of housing and production facilities for district purposes.[110] There are no budgetary regulations in legislation that link this process to measures to mitigate or adapt to climate change.

At the state level, funding for climate change initiatives does not reach the extent specified in the LCCT. The National Strategy for Adaptation to Climate Change to 2030 outlines strategic actionable adaptation options and investment projects that require implementation to strengthen resilience of the country and reduce the

107. Article 5 of the Law on Public Finance of the Republic of Tajikistan
108. Tax system of Tajikistan.
109. p.8 of the Features of the system of local taxes and fees: international experience, existing practice and the possibilities of its adaptation for the Republic of Tajikistan.
110. p.70 of the Mountain architecture of Tajikistan. Features of the formation and development trends of rural settlements by Akbarov A.A.

vulnerability of its natural and social systems to the impacts of climate change. To support implementation of the adaptation options, the strategy document includes an analysis of funding opportunities.[111] It also specifies that national governmental support should be provided for local government bodies, on matters of funding and technical assistance for the implementation of projects and/or programmes designed to mitigate or adapt to climate change. However, as identified in section 3.4.1, there is currently no plan in place to action the implementation of the National Strategy for Adaptation to Climate Change.

Moreover, the strategy does not contain requirements to allocate resources to local authorities to finance climate change mitigation and adaption in urban planning. As previously stated, legislation on climate change and urban planning remain parallel and do not intersect.

6.1.1. Public-Private Partnerships

Public-private partnerships in the republic are governed by the 2012 Law on Public-Private Partnership which defined the following structure of governance for their management.[112]

Despite this well-defined governance structure for public-private partnership regulation, regulation is implemented only in the following areas:

- Energy sector;
- Transport sector;
- Water supply and utilities;
- Social sector.[113]

Though there are PPP legislative regulations implemented in some sectoral areas, there are no further financial mechanisms (e.g. municipal bonds, green bonds, concessional loans) to facilitate capital investment under the legislation of Tajikistan. This places limitations on potential financial support for climate change initiatives.

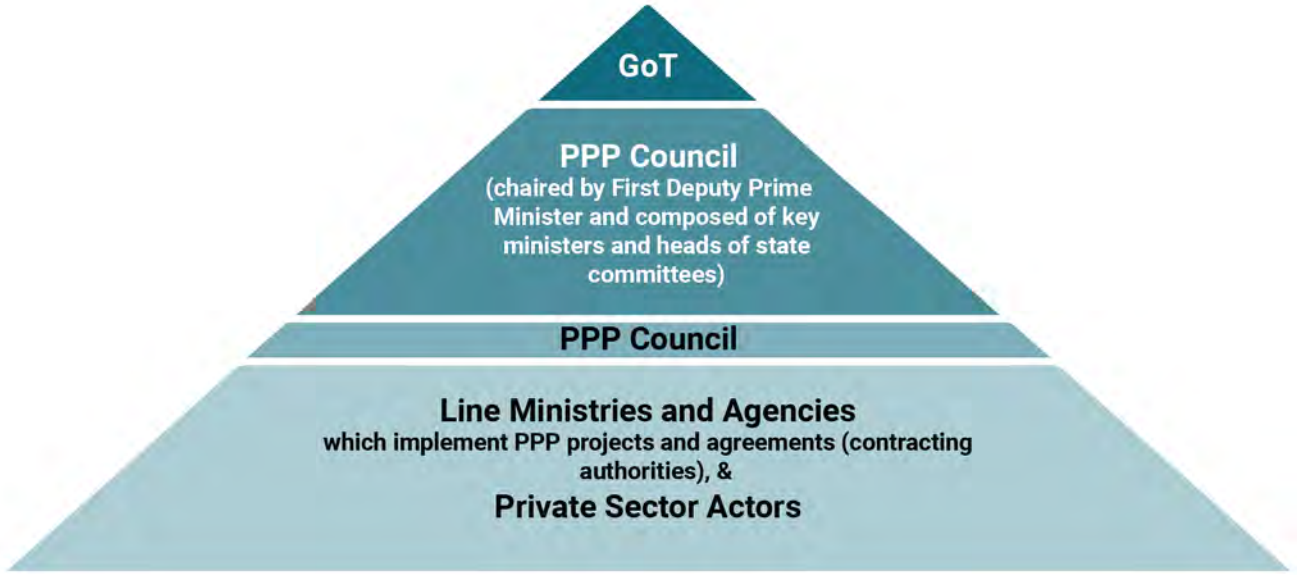


Fig 20. Governance structure of PPP

111. p.38 of the National Strategy for Adaptation to Climate Change until 2030.
112. p.10 of the ADBI Working Paper series "Are Public-Private Partnerships s solution to the infrastructure backwardness of Tajikistan" by Ziyodullo Parpiev.
113. p.29 of the Financial Analysis to Support Sustainable Development Goals in Tajikistan.

6.2. INCENTIVES FOR MITIGATION AND ADAPTION IN URBAN PLANNING

As for the issues of support climate change mitigation in urban planning, as mentioned earlier, they themselves are very fragmented in this area. The work that is being carried out, firstly, does not relate to urban planning, and, secondly, to a greater extent relies on financial assistance from donors – international organizations and/or international projects, such as PPCR. They, for example, are focusing on the following thematics: Climate Information Systems and Disaster Risk Management, Infrastructure (in Energy Sector), Agriculture and Landscape Management, Water Resources Management and Enabling Environment[114] without paying attention to urban planning. This confirms what was said above: urban planning and climate change issues do not overlap, being developed as parallel spheres. Moreover, incentives to achieve climate change mitigation and adaptation objectives in urban planning are also not represented in this context.

6.3. INCENTIVES THAT PROMOTE SUNSUSTAINABLE URBAN LAND USES

There is no clearly defined regulation to prevent unsustainable use of urban land in Tajikistan, in either technical or economic legislation. This is an important area to legislate as only 7 per cent of the territory is suitable for development. Urban sprawl will have more damaging impacts on such a complex topography with limited buildable area.

6.4. RECOMMENDATIONS

Currently, there are no financing mechanisms in place to support implementation of climate change adaptation projects nor is there coordination between agencies to analyse and address financing needs. The analysis showed that the legislative separation of climate change concerns and urban planning has resulted in a loss of financial resources for urban climate change initiatives. However, legislation on financial mechanisms such as public-private-partnerships could be further leveraged to promote more stringent regulation of urban planning for climate change mitigation and adaptation.

Recommendation 1: To include funding for climate change mitigation and adaption in urban planning legislation. Along with programmes that deal with agriculture and water issues, it is also important to separately allocate resources for identification, prioritisation and implementation of adaptation options for the risks and vulnerabilities that impact and are impacted by urban planning, measuring the level of greenhouse gases likely to be produced during and after construction of new buildings and structures, and energy efficiency of buildings and infrastructures for transport and mobility, communications, etc.

Recommendation 2: Upgrade the role of governments with powers of implementation for climate change initiatives. This should first be applied at the national level, and later at the regional and local levels. This will require empowerment of governments with the basis for independent financial regulation on climate related projects cross-cutting urban planning. Also, financial independence combined with the transfer of select urban development functions to the regional and local levels, will strengthen the position of those authorities and provide them with the opportunity to quickly respond to emerging issues.

114. p.16 of the Climate Change in Afghanistan, Kyrgyzstan and Tajikistan: Trends and Adaptation Policies Conducive to Innovation by Parviz Khakimov.

6.5. LCCT CHECKLIST 5: ECONOMIC AND FINANCIAL INSTRUMENTS

	Category	Present/ Absent
Resources for urban planning and climate change	Does your country have provisions of law or regulations that create a flow of resources to finance climate change mitigation and adaption in urban planning?	☒
	Do these include provisions that establish earmarked intergovernmental fiscal transfers & to local governments for climate change mitigation and adaption in urban planning?	☒
	Do these include provisions that give local governments the responsibility to collect locally generated revenues?	☑
	Do these include provisions that give local governments the authority to decide how to spend locally generated revenues?	☑
	Do these include provisions that require local governments to earmark resources for urban planning and climate change?	☑
	Do these include provisions that create enabling environment that facilitate mobilization of investment capital?	☒
	Do these include provisions that allow local governments to receive a public credit guarantee by the national government?	☒
	Do these include provisions that create frameworks for public private partnerships?	☑
Incentives for mitigation and adaption in urban planning	Does your country have provisions of law or regulations that create incentives to achieve climate change mitigation and adaptation objectives in urban planning?	☒
	Do these include economic incentives to support climate change mitigation in urban planning?	☒
	Do these include non-economic incentives to support climate change mitigation in urban planning?	☒
	Do these include economic incentives to support climate change adaption in urban planning?	☒
	Do these include non-economic incentives to support climate change adaption in urban planning?	☒
Incentives that promote unsustainable urban land uses	Does your country have provisions of law or regulations with incentives that promote unsustainable urban land uses?	☒
	Do these include economic incentives that promote unsustainable urban land uses?	☒
	Do these include non-economic incentives that promote unsustainable urban land uses?	☒

Table 12. LCCT checklist 5.

Fig 21. Main road in Khorog, May 2021

7

APPLICABILITY TO KHOROG

Key features of the LCCT include functionalities to search for existing climate change-related legislation and to undertake an assessment of a selected country's legislation. The core idea of the Urban Law Module is to help national governments, international organizational and experts to implement national climate change laws. Whilst the emphasis is on national legislation, many issues go deeper to address both regional and local applications.

In the "Integrated Spatial Plan for Environmental and Socio-Economic Resilience, Khorog, Tajikistan" project, importance is placed on the local level. It is important to question, therefore, how this study can be applied directly to the regulation of Khorog. Below are the main points of this legal analysis for the city-scale.

Verticalisation of changes. The state system of Tajikistan is built in such a way that management is conducted from the centre, and thus the system is verticalized. For the implementation of any changes, namely the empowerment of local authorities in the field of urban planning or the introduction of a policy of accounting for climate change in urban planning at the legislative level, this is driven by the national level. The recommendations provided after each part of the LCCT are aimed at introducing changes from above and subsequently impacting the local level (in our case, Khorog).

Parallels to practical urban planning. Despite the fact that this legal analysis is presented in a separate document, the issues raised, and recommendations provided therein are directly related to the practical part of the project. This is embedded both in the purpose of the Toolkit itself and is directly related to the results of its application. In addition, sections that are directly related to urban planning (e.g. Planning for Adaptation) include an analysis of norms with a view to local application (e.g. street width, population density of cities, etc.).

Spheres requiring resolution have been revealed. Among these, of course are those related to the issues of climate change, which affect both the entire Tajikistan being highly prone to its results, and directly Khorog. One example is the resettlement that the population of Khorog is subjected to in connection with avalanches and landslides. The existing system requires improvement and the LCCT is aimed at improving it, which will have an effect at the local level.

Up-to-date and relaying of information, which became possible through the field mission to Khorog. Standards such as building codes, where the information applicable to the local level is directly outlined, are not accessible online. Furthermore, their applicability in the form of inclusion in the recommendations was tested in place. Thus, the analysis of the document was carried out using the most recent data.

The content of the document meets the project's aim in making Khorog resilient. This is reflected in both institutional and practical areas as well as recommendation provided in five spheres.

Likewise, the legal analysis carried out is directly related to both the local level of urban development and directly responds to the challenges associated with Khorog. It is built on an integrated approach aimed at introducing changes both in the context of the powers of the authorities at the national, regional and local levels, as well as addressing issues that are directly related to urban planning and climate change. Moreover, the approach taken by the LCCT has also revealed legal gaps in climate change issues, the change and / or implementation of which will lead to both compliance with international standards and direct implementation both at national and local levels.

Fig 22. Development along the riverfront, May 2021

8

CONCLUSION

The analysis of Tajik legislation conducted using the Urban Law Module of the UN-Habitat Law and Climate Change Toolkit here, has exposed a number of gaps. This project was conducted to respond to the urgency of the existing problems and their interconnection, as outlined by the existing efforts and statements of the authorities of Tajikistan. The conclusion summarises the points of focus in the legal analysis, and those revealed as requiring attention.

Urban planning is one of two thematic areas on which this module is based. Characteristics of urban planning legislation in Tajikistan were revealed in verticalisation, and a significant level of detachment from other themes or sectors, both in the assigned responsibilities of the authorities and in procedural outlines. The information that was obtained for analysis in the urban planning review of this document was found almost exclusively in sectoral-specific documents, though the LCCT expresses the requirement to take account of information from various thematic areas and industries (primarily climate related legislation). As far as possible, therefore, relevant documents from other sectors and themes have been referenced where relevant. When there was a need to refer to building codes in the assessment, the differentiation between urban planning and climate mitigation/adaptation directives is clearly expressed. Fragmentation of themes between different sectoral legislation has led to the exclusion of urban planning considerations in many national programmes, strategies and action plans, which could jeopardise the region's continued growth and achievement of SDG 11.

Local authorities often lack the capacity to collect and use data and information, and the tools to understand the long-term impacts of urbanisation and growth, which limits their ability to properly plan and implement urban solutions that ensure resource efficiency and future urban resilience. The lack of reliable forecasting to predict necessary infrastructure and resource requirements is likely to contribute to urban sprawl, overconsumption or inefficient use and management of resources. This could also lead to severe environmental impacts, scarcity of natural resources, increased inequality, and lack of access to services for both residents and industries. There is an ongoing need for long-term financing and investment strategies to support forecasting and planning solutions to deal with this.

The second thematic area of focus in this report was climate change. Given country's vulnerability to the potential and demonstrated impacts of climate change, mitigation and adaptation measures must be addressed appropriately, both at the level of goals and targets and at the level of legislative measures. Maximum interconnection of national programmes and strategic documents with the Sustainable Development Goals can be used to align global and national priorities and create mechanisms for targeted funding. Moreover, it is of huge importance to consider climate change in the context of urban planning and development, and "mainstream" all related concerns into physical, spatial, sectoral, and comprehensive development plans.[114]

Use of the LCCT in this analysis revealed that Tajikistan possesses huge potential in the abovementioned legislative spheres. Use of the Toolkit made possible the identification of priority areas for climate law and urban planning regulation review, and potential areas for legislative or regulatory reform. The separation of regulatory systems in urban planning and climate change, requires action to ensure integration of themes in a unified solutions system. The five-module system of the LCCT was used to guide this step-by-step analysis and structure uniform recommendations.

115. p.8 of the Planning for Climate Change. A Strategic, Values-Based Approach for Urban Planners.

9

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