Beledweyne, the largest city of Hishabelle State of Somalia, has constantly suffered from devastating floods. Over the past decade, floods have increased in magnitude and recurrence, reaching alarming levels by 2019, where 68% of the city was flooded.

Students from the Institute for Cooperation in Basic Habitability (ICHaB-ETSAM) and colleagues from UN-Habitat Somalia Programme have jointly developed this working paper. It aims to establish the spatial basis for flood risk analysis and urban resilience of Beledweyne.

ICHaB-ETSAM is an academic institution that belongs to the Universidad Politécnica de Madrid (UPM). Since its foundation in 1995, ICHAB has continuously carried out teaching, research and awareness-raising activities in the field of basic habitability with a special focus upon informal settlements.

This working paper has been developed under Midnimo II (Unity) project - Support for the Attainment of Durable Solutions in Areas Impacted by Displacement and Returns in Galmudug and Hirshabelle States, funded by United Nations Peacebuilding Fund.

This study has been conceived as a first step to explore long-term solutions to make the city of Beledweyne, including its most vulnerable communities, more resilient to floods and other natural hazards.

Comments and further inputs to consolidate this paper are highly appreciated. Please send feedback to: unhabitatsom@un.org
In pre-war Somalia, large-scale irrigation schemes existed along the Juba and Shabelle basins. This irrigation system comprised primary, secondary canals and numerous tertiary canals. Currently, the majority of this infrastructure is not functioning, and the area under irrigation has been significantly reduced.

Somalia economy is predominantly agricultural and it depends highly on water availability, which in turn is reliant on rainfall. There are two types of agriculture in Beledweyne area: Rainfed Agriculture characterized by water harvesting, and Irrigated Agriculture.

Land degradation in Somalia is negatively affecting land productivity.

Sources (links):

Threats (links):
UNHabitat, UNHabitat Somalia
The urban form is totally defined by the course of the river Shabelle. In the central part of the city, surrounded almost entirely by the meanders of the river, is one of the most dense areas characterized by having the main urban services of the city: hospitals, markets and government facilities.

The built-up area in Beledweyne has grown steadily at an average rate of 5% per year over the last fifteen years. This growth has mainly taken place in two urban villages and towards two directions: Howlwadag to the west and southwest, and Hawo Tako to the east and northeast. Most likely the city has grown in these directions by fleeing the north and south areas that are prone to continuous flooding. These two urban villages, Kooshin in the north and Bundoweyn in the south, are not expected to grow much further in the future as they border large areas of crops.

In the last five years, due to the lack of any planning system, a dispersed, organic development has sprawled towards the east, along the road that connects the city center with the trade corridor that goes from Mogadishu to Ethiopia. The fast urbanisation rates of Beledweyne and the lack of proper planning will multiply vulnerability of the urban population, its physical assets and its economy because of the increasing frequency and intensity of natural hazards.

Sources: Beledweyne Urban Profile (Draft). UN-Habitat
MAP 03 - ANALYSIS Historical floods and river breakages

Legend
- Flood-prone area (UNOSOS)
- Flooded area (SWALIM 2018)
- Flooded area (UNOSAT 2019)
- Overflow area
- Open breakage point
- Closed breakage point
- Potential breakage point

Map 03 Historical floods and river breakages analyzes the flooding data of the last few years as well as the points of the Shabelle River overflow. For this purpose, information layers from different sources indicated below have been superimposed.

Historical floods

River breakages

Sources (links):
- FAO SWALIM (historical floods, river breakages 2019)
- UNOSAT (November 2019 flood)
- Humanitarian response: UNICEF, health clusters (OCHA)
Flood exposure is the situation of people, infrastructure, housing, production capacities and other tangible human assets located in flood-prone areas.

MAP 04 - ANALYSIS Flood exposure aims to synthesize the different parameters analyzed in the previous map to spatially categorize Beledweyne in different areas according to their level of exposure to flooding.

Beledweyne town is not only flooded by the river overflows caused by rainwater from the highlands of Ethiopia but also flash floods injecting huge amounts of water into the river. The city also rests in a huge depression between mountains that supports an easy flow of flood water from upstream, descending towards the depression zone in the lower stream.

Reference: MAP 03 - ANALYSIS

Sources (links):
- FAO SWALIM (historical floods, river breakages 2019)
- UNOSAT (November 2019 flood)
- Humanitarian response: UNICEF, health cluster, OCHA
Vulnerability: the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

Vulnerability is multidimensional and cannot be measured simply by analyzing a satellite image.

However, MAP 05 - ANALYSIS Vulnerability attempts to identify two settlement types of Beledweyne that are particularly vulnerable to flooding:

- IDP camps with gender-disaggregated population data and,
- Informal settlements, identified through visual analysis of the density and irregularity level of the settlements as well as housing building quality.

A more detailed analysis of the rest of the factors, including data collected on the ground, is necessary to achieve a more accurate and comprehensive vulnerability diagnosis of Beledweyne.

Reference: Urban villages and clan distribution

Sources (links):
CCCM Cluster 2020 IDP data in Beledweyne, and 2017 information.
MAP 06 - ANALYSIS Flood Risk

Legend
- Very High Risk
- High Risk
- Medium Risk
- Medium - Low Risk

RISK = HAZARD x EXPOSURE x VULNERABILITY

MAP 06 - ANALYSIS Flood Risk aims to analyse the flood risk levels by overlaying the MAP 04 - ANALYSIS Flood exposure and MAP 05 - ANALYSIS Vulnerability.

The map is complemented by the table below which aims to estimate through GIS analysis the population exposed to different levels of risk both in IDP camps and informal settlements.

<table>
<thead>
<tr>
<th>RISK</th>
<th>TOTAL INDIVIDUALS</th>
<th>IDP settlements</th>
<th>Informal settlements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High Risk</td>
<td>18,053</td>
<td>9</td>
<td>1,310 7860 1,671 10,193</td>
</tr>
<tr>
<td>High Risk</td>
<td>70,754</td>
<td>9</td>
<td>3,786 22,716 7,875 48,038</td>
</tr>
</tbody>
</table>

Reference: Overlay of Map4 Exposure + Map3 Vulnerability
TABLE 01 - ANALYSIS Population at Flood Risk

<table>
<thead>
<tr>
<th>NEIGHBOURHOOD</th>
<th>Population at Flood Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOWLUWAD</td>
<td>813</td>
</tr>
<tr>
<td>KOSHIN</td>
<td>813</td>
</tr>
<tr>
<td>HAWO TAKO</td>
<td>813</td>
</tr>
<tr>
<td>Bundowey</td>
<td>813</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,440</td>
</tr>
</tbody>
</table>

**Sources:**

CCCM Cluster data (February 2020)

**Notes:**

- **Very High Risk:** 60%
- **High Risk:** 20%
- **Medium/Low Risk:** 20%

**IDP settlements population at risk by neighborhood**

- **Very High Risk:** 31%
- **High Risk:** 51%
- **Medium/Low Risk:** 18%

**Informal settlements population at risk by neighborhood**

- **Very High Risk:** 39%
- **High Risk:** 53%
- **Medium/Low Risk:** 8%
FLOOD RISK ANALYSIS and URBAN RESILIENCE PLAN, Beledweyne

2. URBAN RESILIENCE PLAN PROPOSAL

The Beledweyne Urban Resilience Plan is a comprehensive plan that presents practical actions to strengthen the flood resilience of the city of Beledweyne.

The proposed actions cover a wide range of initiatives from the territorial scale to the scale of construction detail.

This exercise has been carried out through the analysis of secondary data without direct field validation and is intended to be a first step in exploring long-term solutions to make the city of Beledweyne more resilient to floods.

From this point of analysis, a participatory planning process with the local Government and other stakeholders is needed to identify Beledweyne’s resilience building priorities and then, transform them into bankable projects to mobilise funds form implementation.

Sources
- City Resilience Action Planning Tool (CityRAP), UN-Habitat
- Beledweyne Urban Profile (Draft). Working Paper and Spatial Analyses for Urban Planning Consultations and Durable Solutions for Displacement Crises. UN Habitat
TABLE 02 - RESILIENCE PLAN Actions

\[
\text{RISK} = \text{HAZARD} \times \text{EXPOSURE} \times \text{VULNERABILITY} \div \text{CAPACITY}
\]

(ER = Exposure Reduction / VR = Vulnerability Reduction / CI= Capacity Increase)

<table>
<thead>
<tr>
<th>SCALE</th>
<th>MAP</th>
<th>ACTION</th>
<th>RISK EQUATION</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Territorial</td>
<td>MAP 08a/09b - RESILIENCE PLAN</td>
<td>Irrigation infrastructure improvement</td>
<td>ER</td>
<td>2-8</td>
</tr>
<tr>
<td></td>
<td>Territorial scale</td>
<td>Dam rehabilitation</td>
<td>ER</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water reservoirs construction</td>
<td>VR + CI</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urban and rural wells improvement</td>
<td>VR + CI</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agriculture enhancement</td>
<td>ER</td>
<td>4-8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reforestation</td>
<td>ER</td>
<td>8</td>
</tr>
<tr>
<td>City</td>
<td>MAP 09a/09b - RESILIENCE PLAN River Management</td>
<td>Sandbags</td>
<td>ER</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hesco barriers</td>
<td>ER</td>
<td>0.5-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reintaining walls</td>
<td>ER</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Desilting, Removal of sand and waste accumulation</td>
<td>ER</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MAP 10a/10b - RESILIENCE PLAN Road network and drainage system</td>
<td>Roads improvement</td>
<td>VR + CI</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drainage system improvement</td>
<td>VR + CI</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td>MAP 11a/10b - RESILIENCE PLAN Green infrastructure</td>
<td>Green river buffer zone creation</td>
<td>ER</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green areas creation, Infiltration</td>
<td>ER</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td>MAP 12a/12b - RESILIENCE PLAN Urban planning</td>
<td>Green river buffer zone creation</td>
<td>ER + CI</td>
<td>2-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N0-BUILD zones regulation established</td>
<td>ER + CI</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Households at very high flood risk reintegration at lower flood risk zones</td>
<td>ER</td>
<td>2-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urban planning policies creation</td>
<td>ER + CI</td>
<td>2-5</td>
</tr>
<tr>
<td>Settlement</td>
<td>MAP 13 - RESILIENCE PLAN Neighbourhood upgrading</td>
<td>Neighbourhood upgrading</td>
<td>VR + CI</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improvement of building construction techniques. Building code</td>
<td>VR + CI</td>
<td>1-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improvement of access to safe water (water kiosks)</td>
<td>VR + CI</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improvement of solid waste management</td>
<td>VR + CI</td>
<td>2-5</td>
</tr>
<tr>
<td>Governance</td>
<td>N/A</td>
<td>Increase the organisational capacity of the different stakeholders</td>
<td>CI</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capacity building on Urban Disaster Risk Management</td>
<td>CI</td>
<td>1-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Development of Flood Preparedness Plan</td>
<td>CI</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Community awareness of urban resilience</td>
<td>CI</td>
<td>1-2</td>
</tr>
</tbody>
</table>

Reference Map 12a: RESILIENCE PLAN Urban planning
**MAP 08 - RESILIENCE PLAN**  
Territorial scale

**Legend**
- Roads
- Built-up area
- Urban dug well
- Rural well
- Dam
- Agriculture enhancement
- Reforestation
- Irrigation infrastructure improvement

**URBAN RESILIENCE PLAN. PROPOSALS:**
- Irrigation Canals: restore and improve
- Land improvement + reforestation
- CROP - improve agriculture
- DAM 2019 - in rehabilitation process
- RURAL WELL
- URBAN DUG WELL 2019 (SWALIM)
- BUILD

Better water management at territorial level will achieve improved use of the water and infiltration into the ground, reducing urban flooding. The proposal consists on rehabilitation of existing infrastructures such as dams, irrigation channels, irrigation pumps, wells, as well as the analysis of the need for new infrastructure.

Agriculture enhancement, processes of reforestation and soil improvement is needed to increase the water absorption capacity of the territory surrounding Beledweyne.

These actions will not only have an impact on flood mitigation, but also on food security, displacement reduction and livelihood opportunities of vulnerable people.

**Reference:** Satellite image

**Sources (links):**
- FAO SWALIM (water sources, irrigation canals, dams, and degradation)
FLOOD RISK ANALYSIS and URBAN RESILIENCE PLAN, Beledweyne

**Legend**
- Shabelle River
- Affluent
- Bridge
- Very high flood risk
- Overflow area
- Embankment reinforcement
- Sandbags
- Hesco barriers
- Retaining walls

**Proposals**
- Embankment reinforcement
- Sandbags
- Hesco barriers
- Retaining walls

**River management include proposals according to the river breakages points types:**
- Potential - Sandbags
- Open - Hesco Barriers
- Overflows - embankment reinforcement

*(definition of open overflow and potential on link below)*

**Reference:** MAP 03 - ANALYSIS

**Sources (links):**
- FAO SWALIM (river breakages, river breakages 2019, River management)

---

**MAP 09a - RESILIENCE PLAN River Management**

<table>
<thead>
<tr>
<th>ACTION</th>
<th>RISK EQUATION</th>
<th>TIME (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandbags</td>
<td>ER 0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Hesco barriers</td>
<td>ER 0.5-1</td>
<td>0.5-1</td>
</tr>
<tr>
<td>Retaining walls</td>
<td>ER 1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Desilting. Removal of sand and waste accumulation</td>
<td>ER 2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Confidence: High**

**Map shows the flood prone areas and historical floods in Beledweyne. The map also indicates the river breakages points along the Shabelle River, with proposals for river management such as sandbags, Hesco barriers, retaining walls, and embankment reinforcement.**

**Exposure**
- Very High Exposure
- High Exposure
- Medium Exposure
- Medium Low Exposure
Sandbags for potential river breakages points.
They are used to protect against small currents (two feet deep or less). Fill the bags halfway through, use sand if available; however, any type of soil can serve. To make the sandbags last longer, mix one part cement. Place partially filled bags lengthwise and parallel to the direction of flow, with the open end facing against the flow of water. Tuck in all the smaller flaps, keeping the unfilled portion under the weight of the bag to prevent it from opening. This technique has certain limitations: Sandbags will not completely seal the water passage. They deteriorate when exposed to rain and sun for several months, so if the bags are placed too far in advance, they may not be as effective when needed. If it is required that the bags remain for a long time, the addition of cement can increase their effectiveness.

Hesco Barriers for open river breakages points.
Muti-cellular barrier system manufactured from welded zink-aluminium coated steel wire mesh and joined with vertical, helical-coil joints. The units are lined with a heavy-duty non-woven geotextile. When joined and filled, the system can be used to create barriers of exceptional strength and structural integrity.

Retaining walls for embankment reinforcement.
Take into consideration the conditions of the terrain.

<table>
<thead>
<tr>
<th>ACTION</th>
<th>RISK EQUATION</th>
<th>TIME (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandbags</td>
<td>ER</td>
<td>0.5</td>
</tr>
<tr>
<td>Hesco barriers</td>
<td>ER</td>
<td>0.5-1</td>
</tr>
<tr>
<td>Retaining walls</td>
<td>ER</td>
<td>1-2</td>
</tr>
<tr>
<td>Desilting. Removal of sand and waste accumulation</td>
<td>ER</td>
<td>2</td>
</tr>
</tbody>
</table>

Map 09b - Resilience Plan
River Management
During November 2019 floods, 50% of the total road network in the district was affected and infrastructures such as bridges and culverts were also heavily impacted. MAP 10a - RESILIENCE PLAN Road network and drainage system analyses the road sections that are at high and very high risk of flooding and need pavement and drainage improvement to ensure proper mobility for the inhabitants of Beledweyne.

The road sections length in flood risk within the city of Beledweyne are:
- Primary road at very high risk: 1967 metres.
- Primary road at high risk: 8908 metres.
- Secondary road at very high risk: 2990 metres.
- Secondary at high risk: 7030 metres.

A community engagement approach through cash for work activities for the improvement of road infrastructure can be considered to improve livelihood opportunities for the most vulnerable communities.
According to the Map 10a - RESILIENCE PLAN Road network and drainage system, 7 kms of roads and streets in Beledweyne are at a very high risk of flooding, while more than 16 kms are at high risk. Most of these road sections are flooded every year for several weeks until the water is pumped out.

A more long-term solution would be to improve the drainage of these streets in a sustainable way. To do this, various solutions are suggested depending on the width and type of use of each street.

A detailed topographical assessment, the correct choice of pavement materials, the connection of the drainage systems of the surrounding buildings, and the inclusion of appropriate vegetation for phytoremediation are key to the success and sustainability of a drainage system improvement.

Note: Phytoremediation refers to the use of plants and associated soil microbes to reduce the concentrations or toxic effects of contaminants in the environment. Phytoremediation is a cost-effective environmental restoration alternative to engineering procedures that are usually more destructive to the soil.

Reference Map: 10a Road network and drainage system

Source: nature.com, Daniel Vázquez Paredes, ETSAC
This MAP 11a - RESILIENCE PLAN is based on the Green infrastructure concept: a cost-effective approach to mitigate the impact of floods.

The proposal is to establish different kinds of green zones at different locations to infiltrate water from rain and overflows of the river:

1. **Green river buffer zone** on both sides of the river and its main tributaries with local phytoremediation vegetation or agriculture, without creating a visual barrier. This zone should be connected with the “Green ring” creating one integrated water management system.

2. **Green areas or parks** the two largest green existing areas should be improved increasing their density of vegetation. Drainage system from the streets and roads should end here.

3. **Other future green parks** should be identified and created, and green areas should be incorporated into the streets and roads. These areas should be considered as NO-BUILD ZONES in the local regulations and the local authorities should ensure compliance.

Reference Map: 08 - RESILIENCE PLAN Territorial scale

Links/Sources:
Example of green area in public space connected to drainage network and phytoremediation cleaning system

Example of green area and infiltration system

Reference Map: 11a-RESILIENCE PLAN Green infrastructure

<table>
<thead>
<tr>
<th>ACTION</th>
<th>RISK</th>
<th>TIME (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green river buffer zone creation</td>
<td>ER</td>
<td>4-5</td>
</tr>
<tr>
<td>Green areas creation. Infiltration</td>
<td>ER</td>
<td>1-2</td>
</tr>
</tbody>
</table>

To ensure a successful functioning, the city's drainage system has to be designed in a holistic and integrated manner.

The drainage systems of the streets and roads explained in the MAP 10a and 10b- RESILIENCE PLAN Road network and drainage system must be properly connected to green spaces of infiltration spatially identified in the MAP 11a - RESILIENCE PLAN Green infrastructure.

The use of vegetation is key for solving the challenges of soil degradation as well as improving water infiltration and, therefore, mitigating the impact of flooding in the city.

Reference Map: 11a-RESILIENCE PLAN Green infrastructure

Sources (links):
A sustainable urban development plan for the city of Beledweyne should include short-term urban actions that address urgent challenges while, at the same time, thinking about long-term strategies that guide the city’s growth in a sustainable and resilient way.

One short-term action is to seek solutions for the households that are in areas of very high flood risk at this moment. One option to be explored is the relocation and reintegration of these households to the nearby urban fabric in order to maintain their current livelihoods but located in areas with less exposure to flooding.

Reference Map06: ANALYSIS Flood Risk

**Sources/Links:**
- Verified IDP sites in Beletweyne. February 2020. CCCM Cluster
- Beledweyne Urban Profile. UN Habitat, IOM, Somalia Government.
SITE ELECTION: identification of suitable land avoiding flood-prone areas.

- ACCESSIBILITY
- COASTAL INFRASTRUCTURES
- STABILIZED DIRT ROADS
- SANITATION AND DRAINAGE
- ENERGY

RESERVE PUBLIC SPACE FOR:
- SQUARE
- GARDENS
- AVENUE

URBANIZATION

- Social and religious services
- Community facilities
- Green areas / public spaces
- Telecommunication
- Electricity
- Waste management services
- Water and sanitation services
- Markets
- Administration buildings

Services have different catchment distances according to the type of service, the need for the service and the size of the population but the main services that have to be considered are:

- Flood mitigation elements always in the direction of water flow
- Do not direct water to others
- Avoid locating the access of the plot towards the river
- If the plot has some exposure to flooding, locate the house as far away from the river as possible within the plot
- Make the plots as rectangular as possible avoiding nooks and crannies where water can stagnate
- Demarcate the plot with suitable materials
- Keep the plot clean and well distributed

Water kiosk connected to the water network and operated and maintained by community water committees to provide safe and affordable water to the most vulnerable of both IDP and host communities.

In flood prone areas it is important to have water tanks elevated above the maximum water level during the floods to ensure access to clean and safe water in any situation.

Sources (links):
- Verified IDP sites in Beledweyne, February 2020, CCRM Cluster
- Beledweyne Urban Profile. UN Habitat, IOM, Somalia Government.
According to the Risk Analysis, 1,671 households are living in informal settlements at very high flood risk and 7,875 households at high flood risk. It is not feasible to relocate all these households, almost 60,000 individuals, therefore, alternative neighborhood upgrading actions should be explored to make these communities more resilient to future flooding.

MAP 12c - RESILIENCE PLAN Neighbourhood upgrading aims to analyze a catalogue of improvement proposals from a settlement scale to a building construction scale.

After November 2019 floods, there were 1,995 fully damaged and 6,713 partially damaged houses in Beledweyne. A process of repairing and rebuilding these houses should be carried out following a Build Back Better approach to avoid similar damage in future floods. The house improvement process can be carried out in two phases, starting with those houses located in very high flood risk areas and continuing with those at high risk (See map below).

Flood resilient housing

- Elevated latrines. Latrines can cause serious health problems during floods, so it is important to have elevated latrines and keep them closed and clean.
- Reinforcement of the structural elements of the house, including roof and walls, to prevent it from collapsing under the force of water.
- Rainwater harvesting can provide access to water which can be critical during floods.
- Protect the walls with waterproof materials to prevent the walls from being washed out by water.
- Elevated houses. Build a platform or plinth to raise the floor level of the house above the water level during flooding.
- Slope the plot towards the green area and if there is a drainage system in the street, direct the water from the plot towards it. (See details at MAP 10b - Road network and drainage system)

Similar measures to ensure flood resilience should be considered for public buildings.
MAP 14 - RESILIENCE PLAN Market - Collective centre

It is used as a marketplace during normal times

It becomes a collective centre to provide temporary shelter to the most affected people during the floods.

In addition to all the measures explained before, it is advisable to have also certain buildings identified in advance that can function as a collective center to temporarily shelter the most affected people after the floods.

In places that suffer flooding, public facilities such as schools or sports centres are often used as temporary collective centres. However, it is recommended that schools resume operation as soon as possible since the return of children to school is a clear engine of recovery after a disaster.

For this reason, the identification of possible infrastructures that can function as a collective center is needed. However, in case there are not enough, it is recommended to build elevated infrastructures that can be used as a basic service in normal times, like a marketplace, and to shelter the most vulnerable in times of flooding.

For the definition of the project, due to the changes in location and reconstruction of Beledweyne, it is necessary to adapt public buildings to shelter and to rehabilitate damaged hospitals and clinics. In particular, there shall be proper provision of planked footways and guard-rails to ensure safety and clear and safe access to the site.

Links/Sources:
- UNOPS, [https://www.unops.org/es/](https://www.unops.org/es/)
- PUNTLANDPOST, [https://puntlandpost.net/2017/10/02/Aprender-a-viver-com-as-cheias,-UN-Habitat](https://puntlandpost.net/2017/10/02/Aprender-a-viver-com-as-cheias,-UN-Habitat)