

UNLOCKING SUSTAINABLE AND
INCLUSIVE INFORMAL
SETTLEMENTS TRANSFORMATION

RESEARCH AND ACTION PLAN ON THE GOVERNANCE OF INFORMAL SETTLEMENTS IN PREAH SIHANOUK PROVINCE, CAMBODIA



**Unlocking sustainable and inclusive informal settlements transformation,
Research and action plan on the governance of informal settlements
in Preah Sihanouk province, Cambodia**

First Edition
Copyright@2026

United Nations Human Settlements Programme (UN-Habitat) China Office
Address: 6-1-83, Jianguomenwai Diplomatic Residence Compound
1 Xiushui Street, Chaoyang District, Beijing, China
Tel: + 86 10 85325985
www.unhabitat.org

United Nations Human Settlements Programme (UN-Habitat) Cambodia Office
Address: Building A, Phnom Penh Centre, Corner of Sothearos and Sihanouk Blvd, Phnom Penh, Cambodia
Tel: + 855 17 662 787
www.unhabitat.org

Wuhan Planning & Design Institute
Address: No. 1250 Jinghan Avenue, Wuhan, Hubei, China
Tel: +86 27 82804686
www.wpdi.cn

Disclaimer

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries, or regarding its economic system or degree of development.

The analysis, conclusions and recommendations of this publication do not necessarily reflect the views of the United Nations Human Settlements Programme, its Governing Council or its member states.

Reference in this publication to any specific commercial products, brand names, processes or services, or the use of any trade, firm or corporation name, does not constitute endorsement, recommendation or favouring by UN-Habitat or its officers, nor does such reference constitute an endorsement of UN-Habitat.

Acknowledgements

Project supervisors	Bruno Dercon, Zhenshan Zhang, Laxman Perera
Project manager	Sheng Ying, Vanna SOK
Project Lead	Huan Huang, Yueping Hu
Co-authors	Huan Huang, Yueping Hu, Dongdong Hu, Kailei Wang, Ke Zhang, Yang Liao, Yong Jiang, Weijuan Lv, Vanna SOK, Yibo Luan, Jiaxin Chen, Zhangchang Jin, Li Ma, Yue Zheng, Muxi Zhang, Sensamras Piseth, Jin Yang, Kai Peng, Fang Ma, Juan Meng, Cheng Zhou, Jinqiu Fang
Project support	Preah Sihanouk Provincial Government
Reviewers	Zhenshan Zhang, Muxi Zhang, Laxman Perera

This report has been produced by UN Habitat in collaboration with Wuhan Planning & Design Institute

INTRODUCTION

This report is jointly prepared by Wuhan Planning & Design Institute (WPDI) and the United Nations Human Settlements Programme (UN-Habitat) which presents an in-depth study on the governance conditions and transformative pathways of informal settlements in Preah Sihanouk Province, Cambodia. Against the backdrop of accelerating global urbanization and the severe slum problem, the crisis surrounding informal settlements has grown increasingly acute across Southeast Asia. As a key economic growth engine of Cambodia, Preah Sihanouk Province has been confronted with stark imbalances in spatial justice, severe housing shortages and widening wealth inequality. This research aims to advance the implementation of United Nations Sustainable Development Goal 11 (SDG 11), address the development dilemmas of informal settlements, and provide replicable and sustainable governance models with practical experience for Cambodia and the broader Southeast Asian region.

Adopting multi-source data integration and mixed-methods research approach, this research has selected five representative informal settlements for in-depth investigation. The findings reveal a structural contradiction in the province's informal settlements--fragile livelihood foundations coexist with robust endogenous dynamics. Local residents generally have low education attainment, with over half of households living below the poverty line; land tenure remains unclear, and basic infrastructure, particularly drainage and waste management systems, is severely inadequate. Additionally, local residents have resided in the area for an average of 23 years, boasting a strong sense of community belonging and close social ties, alongside a high level of enthusiasm and willingness to engage in in-situ upgrading and renewal projects. Nevertheless, their aspirations for improved living conditions cannot be translated into tangible actions due to shortages of financial resources, technical support and organizational guidance.

To address the identified governance bottlenecks, this research has proposed a comprehensive solution framework covering five interconnected dimensions: human, residential, support, natural and social sub-systems. The strategy emphasizes: enhancing residents' well-being through rights confirmation and registration as well as the regeneration of public spaces; empowering residents to independently improve living conditions by providing a renovation toolbox; bolstering the weak links in municipal infrastructure and connecting employment resources to revitalize development momentum; adopting nature-based solutions (NbS) and strengthening community resilience against storms and floods through mangrove restoration and ecological ditch construction; and unleashing the "collective governance capacity" by establishing a pluralistic co-governance model to ensure equitable and sustainable governance.

To ensure implementability, the report formulates a phased action plan covering foundational, intermediate, advanced stages, and advocates a progressive implementation approach defined by "targeted entry points, small-scale quality". In the foundation stage, it focuses on risk prevention and control by implementing livelihood guarantee projects such as stormwater corridor construction, water and power connection, and safe roadway upgrading. In the pilot stage, it shifts to quality and capacity building, including functional space improvement, ecological environment renovation and resource platform establishment. In the upgrading stage, it advances governance innovation and sustainable development to revitalize public spaces and foster community self-governance mechanisms. These measures will establish a collaborative governance network that is government-led, market-supported, and resident-centered. This network will drive the sustainable transformation and upgrading of informal settlements from passive subsistence to proactive development.

CONTENTS

CHAPTER

1

GLOBAL GOVERNANCE AND RESEARCH VALUE

1.1 Governance Background and Research Significance	03
1.2 Governance Trends and Research Approach	05

CHAPTER

2

RE-EXAMINING: A SURVEY OF THE EVOLUTION AND DEVELOPMENT OF SETTLEMENTS IN PREAH SIHANOUK PROVINCE, CAMBODIA

2.1 Governance Process and Current Predicaments	09
2.2 Survey Interviews and Problem Diagnosis	11
2.2.1 Selection of research sites	11
2.2.2 Details of survey site	13
2.2.3 Socio-economic attributes of survey respondents	17
2.2.4 Survey of informal settlements	18

CHAPTER

3

GOVERNANCE EXPLORATION: A SUSTAINABLE AND INCLUSIVE STRATEGIC FRAMEWORK AND ACTION PLAN

3.1 “Five-Dimensional Capacity” Development Strategy Framework	25
3.2 “Targeted Entry Points, Small-Scale Quality” Action Plan	27
3.2.1 Fostering endogenous renewal capacity and building a long-term self-governing community	27
3.2.2 Enhance Residents’ Well being and Build a Shared Happy Home	28
3.2.3 Unleashing development dynamics for poverty alleviation and building a resource-sharing community	30
3.2.4 Enhancing natural adaptive capacity and building ecologically resilient human settlements	33
3.2.5 Unleashing the collective power of co-governance and innovating a home for co-governance and shared benefits	36

CHAPTER

4

GUARANTEES FOR ACTION AND GLOBAL IMPLICATIONS

4.1 Action Matrix and Guarantee Mechanism	41
4.2 Implications and Prospects	44
4.2.1 Implications of governance	44
4.2.2 Prospect of transformation	44



CHAPTER

1

GLOBAL GOVERNANCE AND RESEARCH VALUE



1.1 Governance Background and Research Significance

Against the backdrop of rapid global urbanization, housing and urban development face multifaceted challenges. Worldwide, approximately 2.8 billion people lack access to adequate housing, secure land tenure, and basic water supply and sanitation facilities, representing 40%¹. Over the decade of implementing SDG 11.1, which aims to ensure universal access to safe housing and related rights, the global community has devoted extensive efforts to tackling informal settlements, yet challenges remain acute. UN joint assessments project that without effective intervention, the world's slum population will triple² in the coming decades (Global Action Plan: Accelerating Transformation of Informal Settlements and Slums by 2030, p.4). The full delivery of SDG 11 has entered a critical stage, calling for coordinated

action among global partners to set actionable consensus principles and implementation pathways, and advance the sustainable and inclusive transformation of informal settlements.

At the regional level, Southeast Asia has become one of the world's primary regions confronting a deepening crisis of informal settlements. In 2022, over 32% of the world's informal settlement (slum) dwellers, totaling 362 million people, resided in Eastern and South-Eastern Asia, with an average annual growth rate of 3.1% (Figure 1.1). Cities across Southeast Asia are advancing the regularization and upgrading initiatives in the hope of solving the informal settlements issues. While several countries have gradually developed national-level policies and plans, such as Vietnam's Social Housing Program and

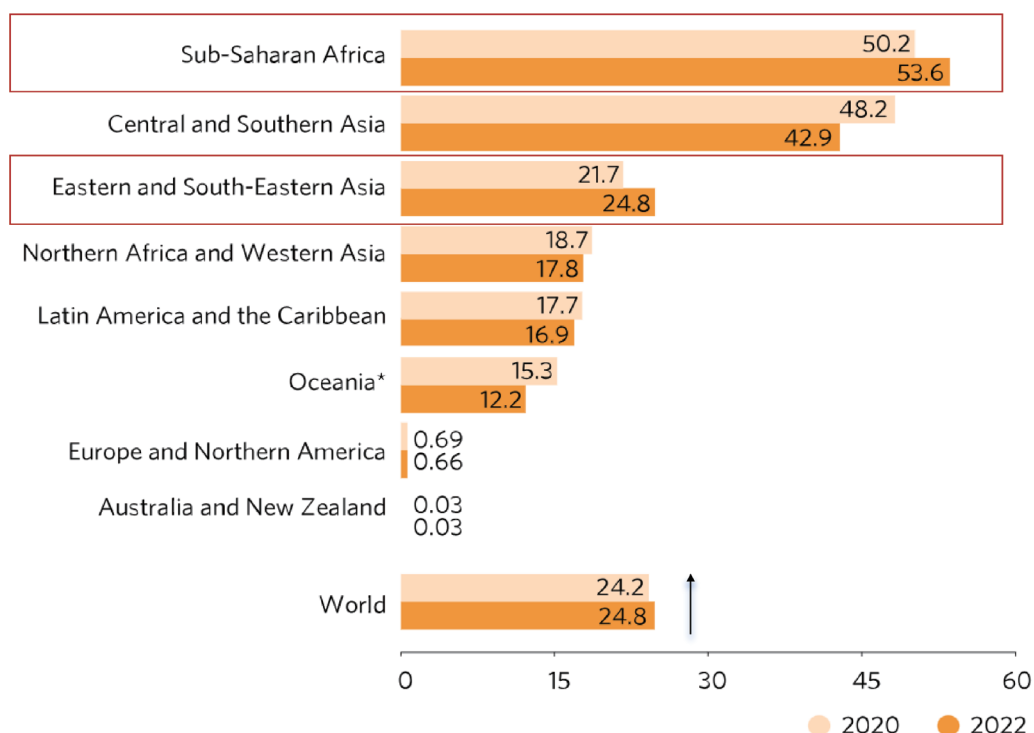


Figure 1.1 Proportion of Urban Slum Population Worldwide (%) in 2020 and 2022
Excluding Australia and New Zealand (Source: <https://unstats.un.org/sdgs/report/2024/Goal-11/>)

Nepal's Urban Development and Building Construction Project the overall implementation has lagged behind targets and been hindered by high implementation costs.

Cambodia epitomizes the key governance challenge facing informal settlement upgrading in Southeast Asia. Over the past two decades, the country has undergone rapid urbanization: its urbanization rate has surged to 56.23%. As one of Cambodia's opening-up windows, Preah Sihanouk Province boasts the highest per capita income in the country, attracting a massive influx of population (Figure 1.2). Nevertheless, under a foreign investment-driven development model, the rapid and extensive expansion of built-up urban areas has exacerbated imbalances in social equity and spatial justice. Although Announcement No. 03 was issued to address the illegal occupation of state-owned land, informal settlement governance has made limited progress and remains at an early stage. By the year 2020, 12.6% of households in Preah Sihanouk Province still lived in informal settlements.

To further draw on Cambodia as a field case and develop replicable solutions to the development challenges facing informal settlements in Southeast Asia, Wuhan Planning & Design Institute (WPDII) was commissioned by the United Nations Human Settlements Programme (UN-Habitat) to jointly conduct research on informal settlement governance and formulate a dedicated action plan for Preah Sihanouk Province, Cambodia. The collaboration was carried out in partnership with the UN-Habitat Beijing Office, the UN-Habitat Cambodia Office, and the Preah Sihanouk Provincial Administration. This pilot initiative seeks to develop a practical governance pathway for informal settlements in line with Cambodia's national development priorities. It aims to support Cambodia's vision of achieving upper-middle-income country status by 2030, strengthen empirical research on urban informal settlement governance, and establish an evidence-based urban governance system to inform targeted policy interventions. At the same time, it showcases the localized implementation of the Sustainable Development Goals and addresses the core development dilemmas of informal settlements.

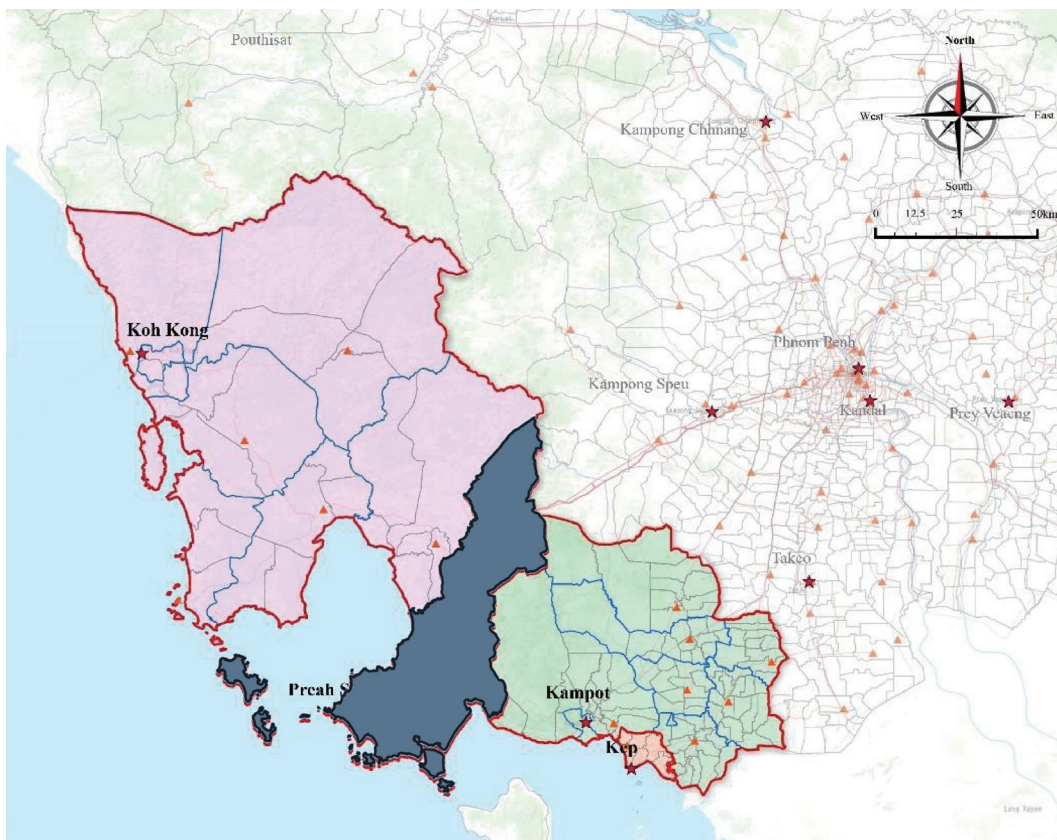


Figure 1.2 Location of Preah Sihanouk Province

1.2 Governance Trends and Research Approach

The study of informal settlements constitutes an important branch of research on urban informality. Early scholarship regarded informality as a form of “residual resettlement” resulting from insufficient absorption capacity of the formal modern sector. It was not until the 1980s that it gradually evolved into a core research theme concerning cities in the Global South. Sociologist Saskia Sassen further divided informality into two dimensions: the informal economy and informal human settlements³, which formally established the academic status of research on informal settlements.

Against the backdrop of global urban expansion over the past three decades, informal settlements have evolved into diverse typologies including slums, squatter settlements, land rental temporary housing, urban villages, and informal settlements. Their connotations and denotations have undergone tremendous changes (Figure 1.3). Academic

research has moved beyond the binary opposition of “formality and informality”. Scholars no longer simply attribute such settlements to a “culture of poverty” or label them as “marginalized spaces”. Instead, greater attention is paid to their complexity and adaptability, with the research focus shifting from etiological analysis to governance-oriented research⁴. In parallel, the United Nations Human Settlements Programme (UN-Habitat)’s Global Action Plan (GAP) advocates adopting effective and inclusive governance, alongside a complementary and coordinated strategic planning framework, to support the comprehensive improvement and in-situ upgrading of informal settlements.

Traditional engineering-led upgrading and governance is prone to falling into the problems of “aestheticization of poverty” and “depoliticization”. Meanwhile, policy-dominated governance models often yield sluggish results due to departmental

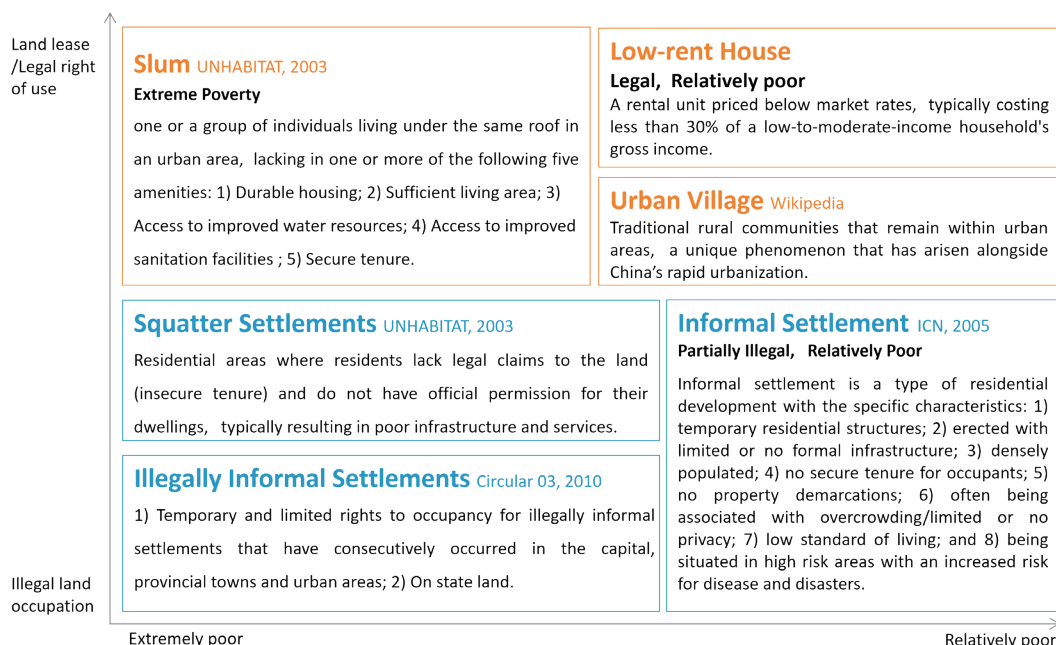


Figure 1.3 Connotation and Characteristics of the Concept of Informal Settlements

3. Urban Think Tank. Informal City: Caracas case[M]. Prestel, 2005: 39.

4. Inclusive Urban Renewal: Governance of Informal Residential Spaces, Chen Yulin.

fragmentation, complex land ownership, and excessively long implementation chains. The comprehensive governance model emphasizes coordinating space, policies and implementation through sustainable and inclusive governance. For instance, São Paulo, Brazil, has adopted Special Zones of Social Interest (ZEIS), following a governance approach that prioritizes environmental improvement before land tenure confirmation and emphasizes community co-governance. This approach has enabled coordinated improvements in infrastructure, public services, and residents' quality of life. Wuhan's urban renewal adheres to a systematic coordination mechanism that prioritizes "assessment before action". It embeds a sustainable operation framework featuring government guidance, market operation and public participation, avoiding large-scale demolition and reconstruction and preventing vanity projects that only renovate buildings without improving residents' real livelihoods.

This research adopts a comprehensive perspective. Based on the Demand for Good Governance (DFGG) model⁵ proposed by the World Bank in its

1992 report *Governance and Development*, it integrates top-down governance mechanisms (planning) with dynamic community-led local initiatives (demand) to promote balanced coexistence between governance stakeholders and community forces. Placing informal settlement governance within the integrated strategic framework of the Five-Dimensional Capabilities, well-being capability, endogenous capability, development capability, adaptive capability, and collective capability, this research develops a strategy-oriented Demand for Good Governance framework model (Strategy-DFGG), and establishes a closed-loop governance action system featuring "Promote-Mediate-Respond-Monitor" (Figure 1.4). Methodologically, the research adopts multi-source data fusion and a mixed-methods approach, combining social surveys, policy analysis, participatory action research, and other tools. Taking typical settlements in Preah Sihanouk Province as pilot sites, it proposes evidence-based improvement and iterative optimization of governance plans through small-scale empirical practice, so as to ultimately elevate the multi-dimensional governance performance.

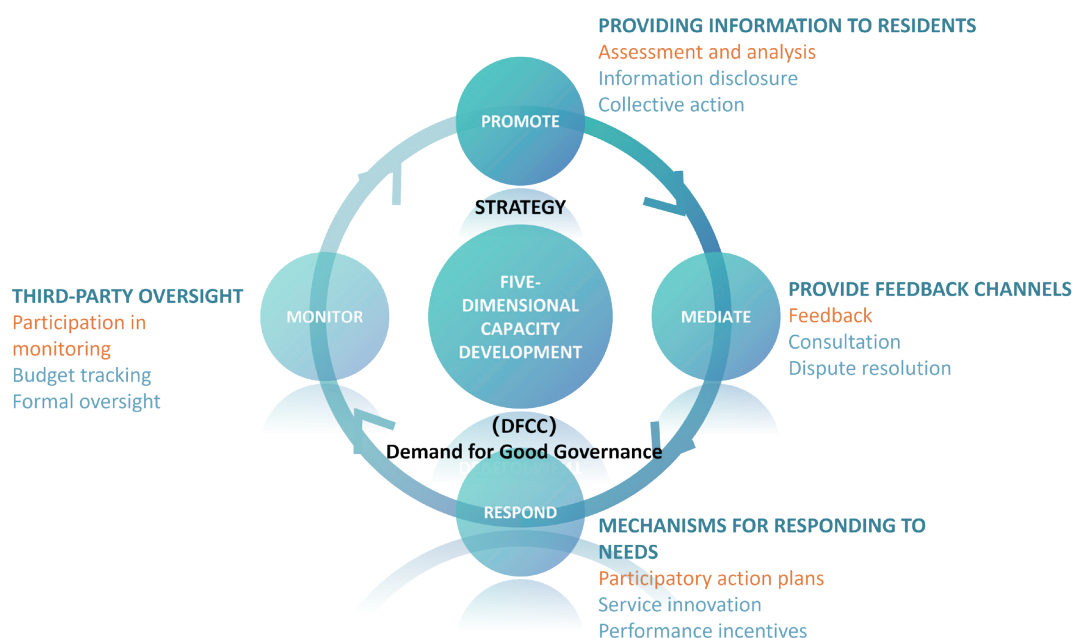


Figure 1.4 Demand for Good Governance Framework (Strategy-DFGG) under the Guidance of the Five-Dimensional Capability Development Strategy

5. Bargawa, V.; Cutler, K.; Ritchie, D. Stimulating the Demand for Good Governance; Partnership for Transparency Fund: Washington, D.C., USA, 2011; Available online: <https://ptfund.org/wp-content/uploads/2018/07/PTF-DFGG-Final-Report.pdf> (Accessed on 13 December, 2025).



CHAPTER

RE-EXAMINING: A SURVEY OF THE EVOLUTION AND DEVELOPMENT OF SETTLEMENTS IN PREAH SIHANOUK PROVINCE, CAMBODIA

2



2.1 Governance Process and Current Predicaments

The evolution of informal settlements in Preah Sihanouk Province is deeply embedded in the special context of Cambodia's post-war national reconstruction, shaped by the forced deurbanization under the Khmer Rouge, disordered land management, and capital-driven rapid urbanization. Since the enactment of the Land Law in 1992, which established the principle of "recognition of de facto occupation", Cambodia has gradually improved its institutional system of governance (Figure 2.1). At present, relying on international assistance, Cambodia has explored an inclusive and incremental governance model of in-situ upgrading, promoting

the transformation of informal settlements from urban peripheries toward organic integration with the city. Nevertheless, its governance is still trapped by deep-seated structural contradictions. A prominent mismatch has emerged between policy goals that favor in-situ upgrading or monetary compensation and the practical conditions required for implementation, including inadequate resource support, elite-led development logic, and strong market-driven forces. This mismatch has become a core bottleneck restricting governance effectiveness. These contradictions are specifically manifested in four major dilemmas:



Figure 2.1 Historical Evolution of Governance Policies

Dilemma 1: Structural conflict between land legalization and market profit-seeking.

Although policies including Announcement No. 03 provide channels for the legalization of land rights, capital tends to acquire land for large-scale project development driven by high land prices. Forced land transfer under such market logic displaces original residents to urban fringes, depriving them of livelihood sources and access to public services.

Dilemma 2: Rent-seeking and governance failure caused by ambiguous regulatory boundaries.

The boundary between state-owned public land (ineligible for tenure confirmation) and state-owned private land (eligible for tenure confirmation) is often blurred. When authorities intend to carry out evictions, valuable residential enclaves are arbitrarily classified as state-owned public land. Such legal ambiguity often creates room for informal connections and patronage networks to operate, rendering formal legal procedures ineffective in grassroots governance.

Dilemma 3: Lack of grassroots discourse power under a centralized system.

Despite policy advocacy for community participation and local planning, municipal governments are constrained by limited autonomy and essentially act as the terminal executor of state will. This top-down decision-making model often ignores residents' demands. When facing development projects that threaten their settlements, communities lack effective bargaining power and institutionalized channels for voicing their concerns.

Dilemma 4: Escalating governance difficulty triggered by overlapping complex risks.

Informal settlements are universally exposed to multiple interwoven risks, including disaster hazards, peripheral location, inadequate infrastructure, and socioeconomic vulnerability. Lacking cross-departmental coordination mechanisms, existing governance policies cannot address such compound systemic crises, leaving risk governance in a long-term fragmented state.

2.2 Survey Interviews and Problem Diagnosis

2.2.1 Selection of research sites

According to the 2025 provincial survey data on informal settlements, there are 59 informal settlement sites in Preah Sihanouk Province, covering 4,867 households and 7,305 families. Spatially, these settlements present a highly concentrated distribution pattern. Specifically, 71% are located in Sihanoukville City, while the rest are scattered across Stung Hav District (17.9%), Prey Nop District (7%), and Kampong Som City (4.1%) (Figure 2.2).

Informal settlements in Preah Sihanouk Province are generally small in scale. Nearly half of the settlements (45.8%) have no more than 10 households. The largest settlement, located in the coastal area of Preah Sihanouk, contains 1,158 households. In addition, 14 micro settlements with only 1 to 2 households are scattered alongside ditches, tidal flats, streams, ponds and other water bodies in rural areas (Figure 2.3). Overall, informal settlements within Preah Sihanouk urban area are

relatively large in scale, followed by those in Stung Hav District near industrial parks and port areas. Settlements in Prey Nop District and Kampong Som City are noticeably smaller. In terms of location, informal settlements are highly distributed along coastlines, rivers and water channels, as well as major transportation corridors including railways and highways. Based on the provincial census data of informal settlements, this research establishes the following selection criteria to accurately identify gathering areas of the most vulnerable groups:

- (1) The settlement is situated on public or private land in environmentally or physically unsuitable zones, including areas adjacent to railways, beaches, road pavements, canals and other high-risk or unfit locations.
- (2) The community has a minimum of 30 to 50 households.
- (3) The settlement is characterized by substandard

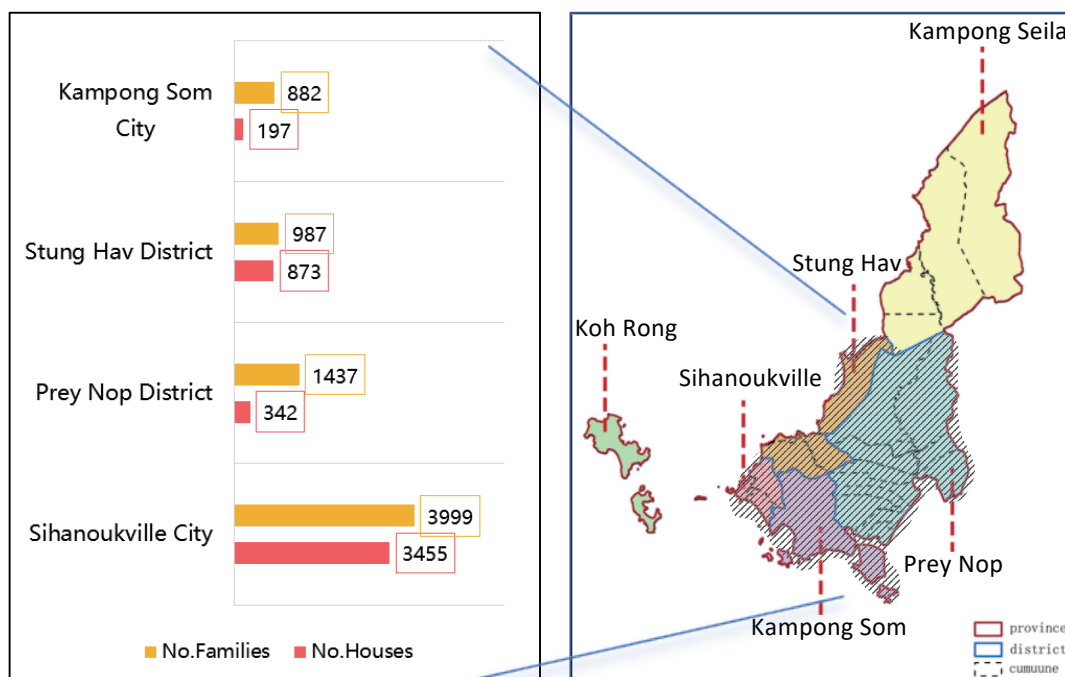


Figure 2.2 Spatial Distribution of Informal Settlement Scale by City and District

housing conditions and high population density.

(4) The community lacks adequate infrastructure, such as drainage systems, paved roads, electricity supply, water supply, sanitary toilet facilities and other infrastructure.

(5) The community has no access to basic services, such as solid waste collection and management, public security and administrative services.

(6) Residents are mainly engaged in factory work, fishing, construction, motorcycle taxi and tuk-tuk driving, domestic work, laundry services, catering, and small household-based workshops.

Based on the above criteria, 5 typical survey sites were finally selected from 59 informal settlements (Figure 2.4) as the objects for in-depth research.

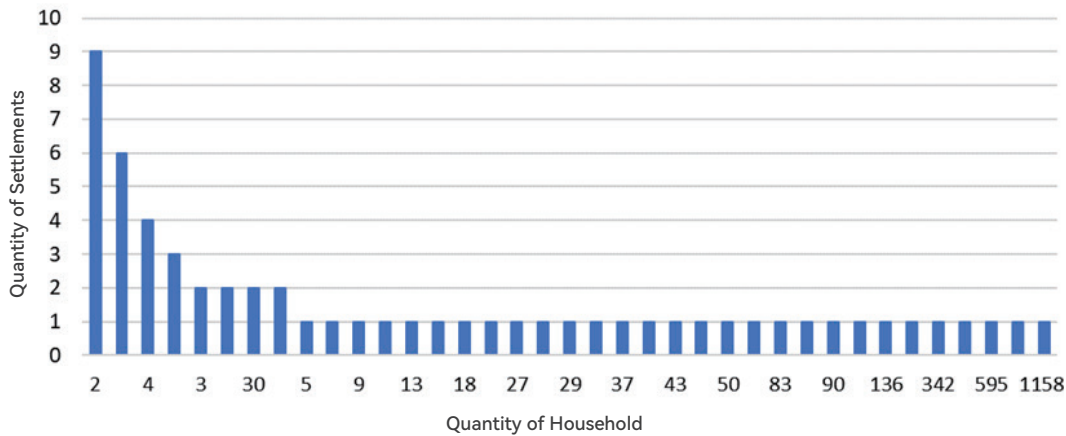


Figure 2.3 Relationship between settlement quantity and household scale

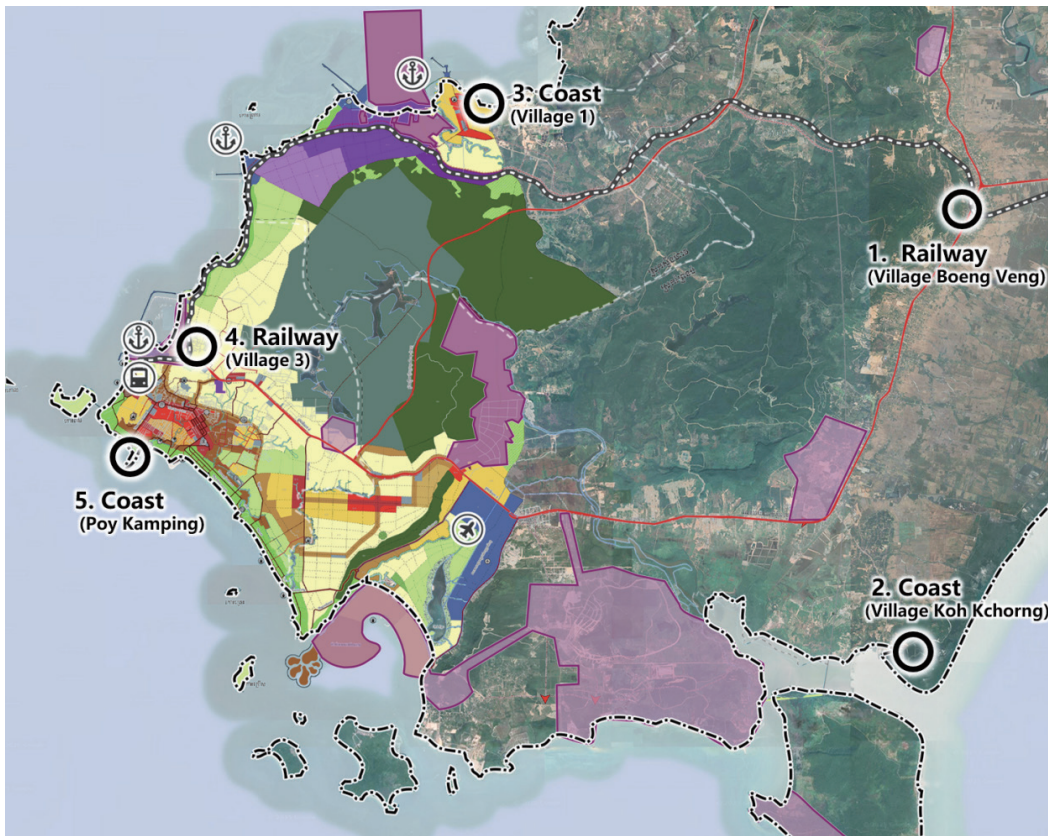


Figure 2.4 Location Map of the Five Survey Sites in Preah Sihanouk Province

2.2.2 Details of survey site

This study selected five survey sites, all of whose informal settlements have been established for more than 30 years with relatively stable development. The current situation, land use scale, number of buildings, resident population and other details of each survey site are as follows:

(1) Survey Site 1 Railway (Village Boeng Veng)

The settlement is located in the central area of Prey Nop District, spanning Village Boeng Veng of Veal Rinh Commune and Village Samrong Kraom of Samrong Commune. It stretches approximately 30m along both sides of the railway in a long and narrow strip, occupying public land along the

railway. To its east are National Highway 3, National Highway 4 and Veal Rinh Market, the largest market in the district, where commercial activities and pedestrian traffic are highly concentrated, resulting in strong location accessibility. Frequent railway freight transportation has significantly affected the surrounding settlement in terms of noise disturbance and cross-track traffic safety. The settlement was founded in the 1990s, when the railway served as a critical corridor for cargo transportation and timber trade. With the construction of the market, a large number of workers migrated here, and a social structure of the informal settlement centered on freight and related service activities gradually took shape and has remained intact to this day.

SN	City (District)	Name of survey site	Site area (ha)	Number of buildings (bldg.)	Number of residents (pers.)	Type of residential area
1	Prey Nop District	Railway (Village Boeng Veng)	5.36	122	610	Railway-side
2	Kampong Som City	Coast (Village Koh Kchorng)	12.01	400	2576	Coastal
3	Stung Hav District	Coast (Village 1)	9.338	300	2000	Coastal
4	Sihanoukville City	Railway (Village 3)	1.74	136	675	Railway-side
5		Coast (Poy Kamping)	2.92	736	3150	Coastal
Total			31.41	1694	9011	—

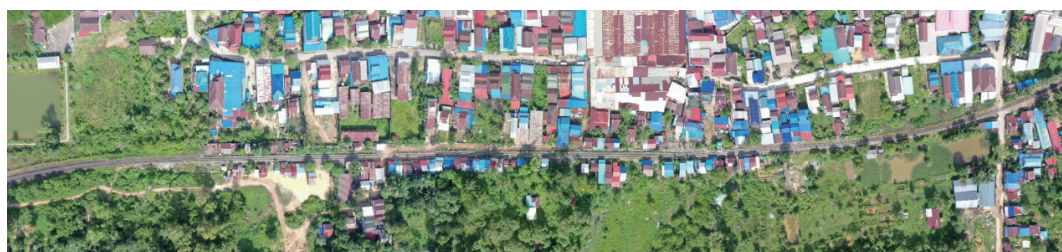


Figure 2.5 Satellite Image of Survey Site 1 (Railway, Village Boneng Veng)



Figure 2.6 Current Situation Photo of Survey Site 1 (Railway, Village Boneng Veng)

(2) Survey Site 2: Coast (Village Koh Kchorng)

The settlement is located in the estuarine area of the eastern coastal zone of Kampong Som City, extending to Village Koh Kchorng of Sangkat Ou Chrov Commune, and occupies public coastal land. Situated at the river estuary, the settlement is bordered by a large expanse of mangroves to the south and existing village roads to the north. The buildings in the settlement are stilted structures built over water to resist inundation from river tides. The river channel in the area is narrow, making it difficult to extend infrastructure coverage, yet the area boasts high fishery and ecological values. The settlement was formed in the 1990s, when residents migrated here to make a living by fishing, and the number of houses has

remained stable for many years.

(3) Survey Site 3: Coast (Village 1)

The settlement is located in the central area of Stung Hav District, adjacent to the coastal oil and gas terminal, and occupies public coastal land. Large-scale supporting facilities in the surrounding area, such as markets, schools and hospitals, are relatively complete and all within walking distance. The houses in the settlement are built on stilts over water, and residents are mainly engaged in fishing, factory work, motorized taxi driving, street food vending and general labor. The settlement was founded in the 1980s, when people settled here to make a living by fishing, and the number of houses has remained stable for many years.



Figure 2.7 Satellite Image of Survey Site 2 (Coast, Village Koh Kchorng)



Figure 2.8 Current Situation Photo of Survey Site 2 (Coast, Village Koh Kchorng)

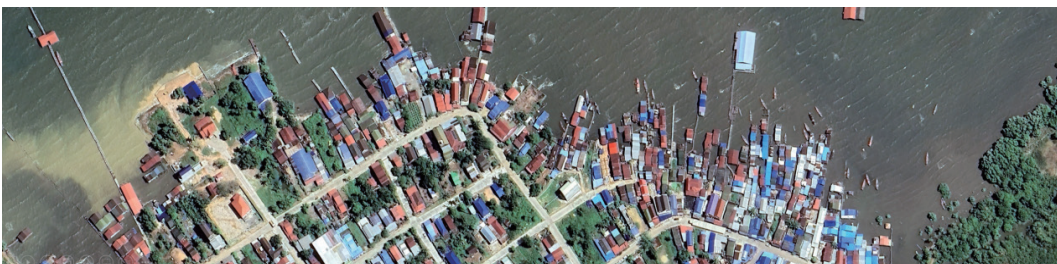


Figure 2.9 Satellite Image of Survey Site 3 (Village 1)



Figure 2.10 Current Situation Photo of Survey Site 3 (Village 1)

(4) Survey Site 4: Railway (Village 3)

This settlement is located in a narrow strip 30m on either side of the port access railway of Sihanoukville Free Port, Sihanoukville City. The space on both sides of the railway is confined and constitutes public land along the railway corridor. The settlement borders the operational zone of Sihanoukville Free Port to the south, with adjacent port-related facilities including packaging centers,

logistics centers and container yards, characterized by a high concentration of freight operations and port-linked industrial activities. Established in the 1980s, the settlement has gradually evolved into an informal settlement owing to its convenient proximity to the city center and tourist attractions, which facilitated residents' daily livelihoods and economic activities. The number of dwelling units in the settlement has remained stable over the years.

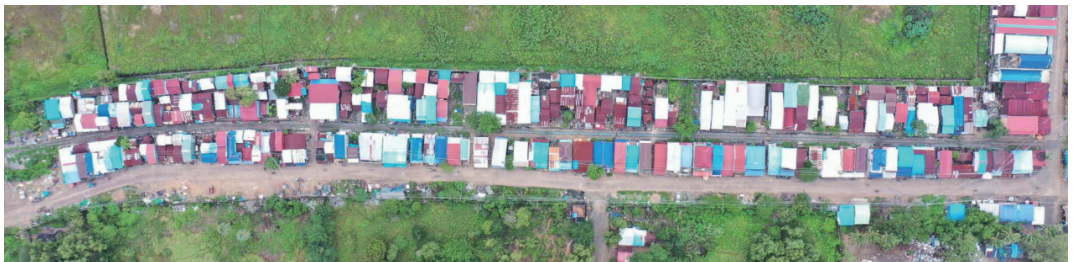


Figure 2.11 Satellite Image of Survey Site 4: Railway (Village 3)



Figure 2.12 Current Situation Photo of Survey Site 4: Railway (Village 3)

(5) Survey Site 5: Coast (Poy Kamping)

The settlement is located in the central coastal business and tourism district of Sihanoukville City, adjacent to abandoned unfinished buildings, and is situated on coastal public land. To the north of the settlement are large-scale commercial facilities such as hotels, shopping malls and casinos, with a high level of commercial vitality. All

real estate projects surrounding the settlement have stalled, leading to an inadequate regional road transport system and considerable inconvenience to residents' daily lives. The settlement was established in the 1980s. In the past, most residents were engaged in fishing, while at present, the majority are employed in the city center.



Figure 2.13 Satellite Imagery of Survey Site 5: Coast (Poy Kamping)



Figure 2.14 Current Situation Photo of Survey Site 5: Coast (Poy Kamping)

2.2.3 Socio-economic attributes of survey respondents

This research adopts a mixed-method approach, combining key informant interviews and household questionnaire surveys to ensure the rigor and representativeness of the data. The research questionnaire was jointly designed by the UN-Habitat Cambodia Office and WPD. After multiple rounds of discussion and consultation with stakeholders, it was revised and deployed for digital data collection via the Kobotoolbox platform. Field investigations were conducted from 13 to 16 October, 2025, with on-site implementation assisted by a trained university research team. A total of 14 key informant interviews were completed, covering township, district, provincial and national government departments as well as relevant NGOs. Meanwhile, 208 valid household questionnaires were collected through random sampling.

The household survey respondents included household heads, primary income earners and their spouses, with the aim of understanding key decision-makers within households. Of the respondents, 75% were female and 25% were male. These

residents represent important community laborers, as the majority are adults aged between 25 and 60 years old, and 89% are married. However, low educational attainment remains a major constraint: 27% of respondents are illiterate, and 50% have completed only primary education. This limited educational background often restricts their access to stable and well-paid employment opportunities, collectively highlighting the socio-economic challenges faced by residents of informal settlements in Preah Sihanouk Province in terms of livelihood choices and living conditions. The average household consists of 5.1 members, with single-person households (58%) and two-generation households (27%) forming the dominant household structures. The average monthly income is 1,475,337 Riel (approximately USD 369), and the average monthly expenditure is 1,154,615 Riel (approximately USD 289), leaving a modest and unstable monthly savings of USD 80. In addition, the per capita daily income is approximately 7,546 Riel. According to the Cambodia Socio-Economic Survey (CSES) 2019-2020, the national minimum subsistence standard set by the Royal Government of Cambodia is 10,951 Riel (USD 2.74) per person per day, and 63% of residents are living below the poverty line (Table 2.1).

Table 2.1 Socio-economic Attributes of Sampled Residents

Variable	Percentage (%)	Variable	Percentage (%)
Position of respondent in household		Educational attainment	
Head of household	65.9%	Illiterate	27.4%
Spouse of household head	2.4%	Primary education	50.5%
Main income earner	31.7%	Junior secondary education	15.4%
Gender		Senior secondary education	5.3%
Male	25%	Bachelor's degree	1.4%
Female	75%	Household structure	
Age		Living alone	57.7%
20-30	8.7%	Two-generation household	26.9%
30-40	21.6%	Three-generation household	13.5%
40-50	28.3%	Four-generation household	1.9%
50-60	22.5%	Average household size (persons)	5.1
Above 60	18.8%	Average monthly income (Riel)	147533(USD 369)
Marital status		Average daily expenditure (Riel)	115462(USD 289)
Single	1.4%	Per capita daily income (Riel)	7546(USD 1.88)
Married	89.4%		

2.2.4 Survey of informal settlements

Key informant interviews were conducted to identify resource advantages and governance willingness. In view of the current situation that the top-level central policy design is difficult to be implemented at the local level and local resources are scarce, provincial authorities have defined three core directions for future governance. **First**, the government should actively seek assistance from external partners, mobilize charitable donations and social investment, raise the necessary resources for in-situ upgrading or resettlement, and jointly formulate forward-looking strategic plans for the surveyed sites. **Second**, it should submit relevant plans to the central government to secure policy support, promote the inclusion of informal settlements in the overall housing development plan, and ensure coherent policy implementation from the central to the local level. **Third**, priority should be given to in-situ upgrading, with a focus on improving housing quality and core infrastructure, systematically addressing environmental and sanitation problems, providing livelihood skills training for residents, and exploring the social land concession scheme.

Household questionnaire surveys were administered to clarify residents' development evaluation and governance priorities. Based on questionnaire data and indicators, an evaluation and monitoring system for the development feedback of informal settlements was constructed, covering 5 dimen-

sions and 10 core indicators (Table 2.2). The system is used to comprehensively assess the current development level and dynamic changes during the upgrading process of informal settlements. Combined with the average overall indicator performance in the table, the system identifies development gaps and potential driving forces in each dimension, providing a basis for targeted policy formulation. The evaluation and indicators can be dynamically updated and improved in follow-up work in light of the upgrading and development needs of informal settlements.

The overall development status is characterized by the coexistence of weak livelihood foundations and robust endogenous dynamics. The survey data clearly delineates the unbalanced development landscape of informal settlements. On one hand, residential rights, housing conditions and economic resilience remain prominent constraints—over half of households rely on low-income support (ID Poor proportion: 53.9%), an extremely low full property rights ownership rate (2%) and crowded living spaces (15.2m² per capita), coupled with insufficient coverage of basic public services (average achievement rate: 68.5%), which directly undermine residents' quality of life and sense of security. On the other hand, the communities harbor valuable initiative and social cohesion—residents demonstrate a strong permanent residency willingness (86.6%), high demand for habitat improvement (88%), close neighborhood ties (cohesion rate exceeding 60%) and strong public participation willingness (participation rate: 65.3%), which constitute precious social capital for community self-renewal (Figure 2.15).

Table 2.2 Indicator System for Development Evaluation and Monitoring of Informal Settlements

Analysis Dimensions	Development Evaluation and Feedback Indicators	
Well-being and livelihood rights	1	Proportion of ID Poor households (%)
	2	Proportion of full property rights holders (%)
Community endogenous dynamics	3	Residents' permanent residency willingness (%)
	4	Residents' settlement improvement willingness (%)
Economic and social potential	5	Proportion of non-daily low-wage employment (%)
	6	Ratio of household savings to income (%)
Human settlements environmental quality	7	Per capita living space (m ² /person)
	8	Average achievement rate of five categories of basic services (%)
Social collaboration networks	9	Neighborhood cohesion (satisfaction level)
	10	Participation rate in community improvement plans (%)

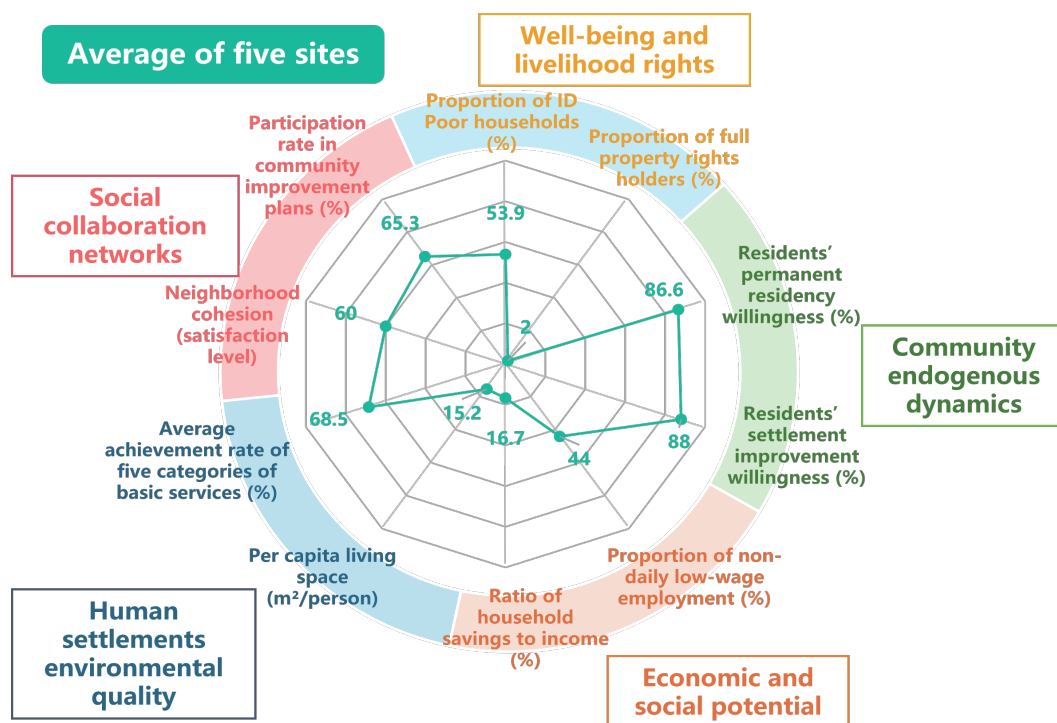


Figure 2.15 Radar Chart of Overall Development Evaluation

Based on a comprehensive analysis of multi-dimensional indicators, the surveyed sites demonstrate differentiated development characteristics and governance challenges. Collectively, this reflects the complex landscape of informal settlements shaped by the interplay of natural conditions, locational endowments, social structures and governance foundations. Specific evaluations are as follows:

(1) Survey Site 1: Strong Collaborative Advantage, Structural Deficits in Endogenous Community Dynamics

This site underperforms in the dimensions of Well-being and Livelihood Rights (ID Poor proportion: 63.2%) and Human Settlements Environmental Quality (per capita living space: 9.4m², basic service achievement rate: 51.6%), reflecting pressures in basic livelihood security and housing conditions. The community suffers from several critical infrastructure deficiencies. Survey data indicate that 15.8% of households experience an unstable water supply, reflecting the absence of a reliable water supply system. In addition, the lack of a waste transfer system has resulted in waste accumulation, posing serious hygiene and safety risks to residents. The area's proximity to mountainous highlands also

creates drainage-related safety hazards during the rainy season. These problems are further worsened by stagnant rainwater and waste pollution, leading to poor living conditions.

This site excels in Social Collaboration Networks, with a neighborhood cohesion rate of 84.1% and a community improvement plan participation rate of 78.9%, demonstrating a solid foundation for collective action and public engagement. Notably, the community shows structural weaknesses in its endogenous development dynamics, with only 36.8% of residents willing to stay permanently. This indicates that external factors, such as railway noise and public security conditions, constrain residents' willingness to remain in the settlement. Comprehensive environmental remediation and service upgrading are urgently needed to unlock sustainable endogenous development momentum (Figure 2.16).

(2) Survey Site 2: Significant socio-economic potential, yet persistent deficits in livelihood rights and well-being

This site boasts prominent development potential, outperforming the average level in the Economic and Social Potential dimension (non-daily low-wage employment proportion: 46.7%, household savings-to-income ratio: 43.6%) and delivering relatively sound

Human Settlements Environmental Quality (per capita space: 27.2m², basic service achievement rate: 68%), except for the severe lack of water supply and drainage infrastructure. Surveys confirm the near absence of an organized drainage system; approximately 6.7% of households report unstable water

supply. The site has significant gaps in Well-being and Livelihood Rights (full property rights ownership rate: 0%) and a relatively low participation rate in Social Collaboration Networks (60%), restricting the effectiveness of co-construction and co-governance (Figure 2.17).

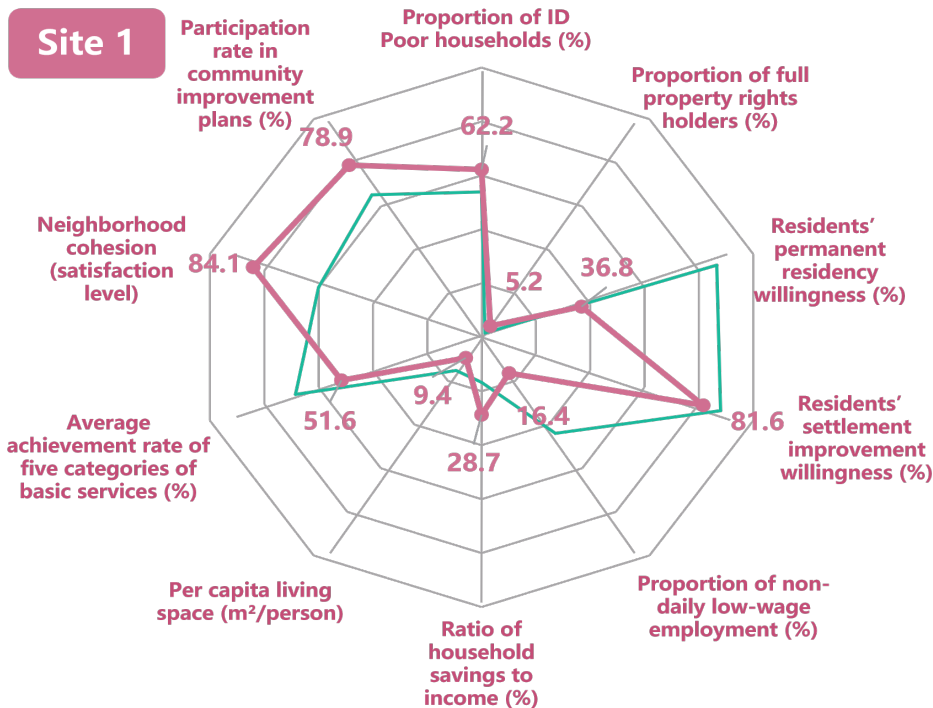


Figure 2.16 Radar Chart of Development Evaluation for Site 1

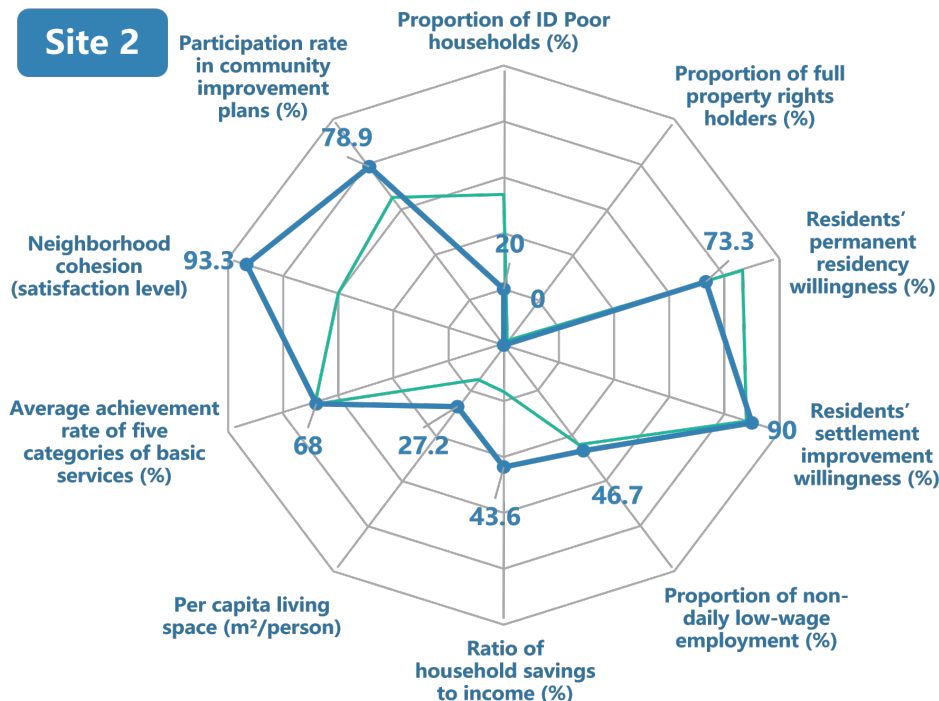


Figure 2.17 Radar Chart of Development Evaluation for Site 2

(3) Survey Site 3: Sound living environment, yet socio-economic potential awaiting urgent enhancement

This site features outstanding ecological value, with strong performance in Human Settlements Environmental Quality (basic service achievement rate: 74.4%) and Community Endogenous Dynamics (permanent residency willingness: 78%, improvement willingness: 89%). Compared with other survey sites, it has a relatively complete infrastructure system with stable water and power supply; the core deficiency is the lack of a drainage system, with 96% of households reporting no organized drainage facilities. However, it presents marked weaknesses in Economic and Social Potential (household savings-to-income ratio: merely 1.5%) and insufficient Well-being and Livelihood Rights security (ID Poor proportion: 60%), reflecting a misalignment between economic development and livelihood protection (Figure 2.18).

(4) Survey Site 4: Development across dimensions remains uneven, and systemic resilience requires strengthening

This site has distinct locational advantages, with moderate performance in Human Settlements

Environmental Quality (basic service achievement rate: 74.3%) and Economic and Social Potential (non-daily low-wage employment proportion: 41.2%). In terms of infrastructure, both water and power supply remain unstable – survey data shows 2.0% and 2.9% of households respectively report unstable power supply. The site has weak Community Endogenous Dynamics (permanent residency willingness: 51.9%) and inadequate Well-being and Livelihood Rights protection (full property rights ownership rate: 0.9%), with unbalanced cross-dimensional development and an urgent need to strengthen overall systemic resilience (Figure 2.19).

(5) Survey Site 5: Confronted with intertwined multi-dimensional challenges, a systemic approach to governance is imperative

This site is the most complex in development context. While it has a foundational advantage in Social Collaboration Networks (neighborhood cohesion rate: 86.3%) and Community Endogenous Dynamics (improvement willingness: 86.4%), it faces challenges across multiple core dimensions: Well-being and Livelihood Rights (full property rights ownership rate: 0%), Economic and Social Potential (household savings-to-income ratio: 9%) and Human Settlements

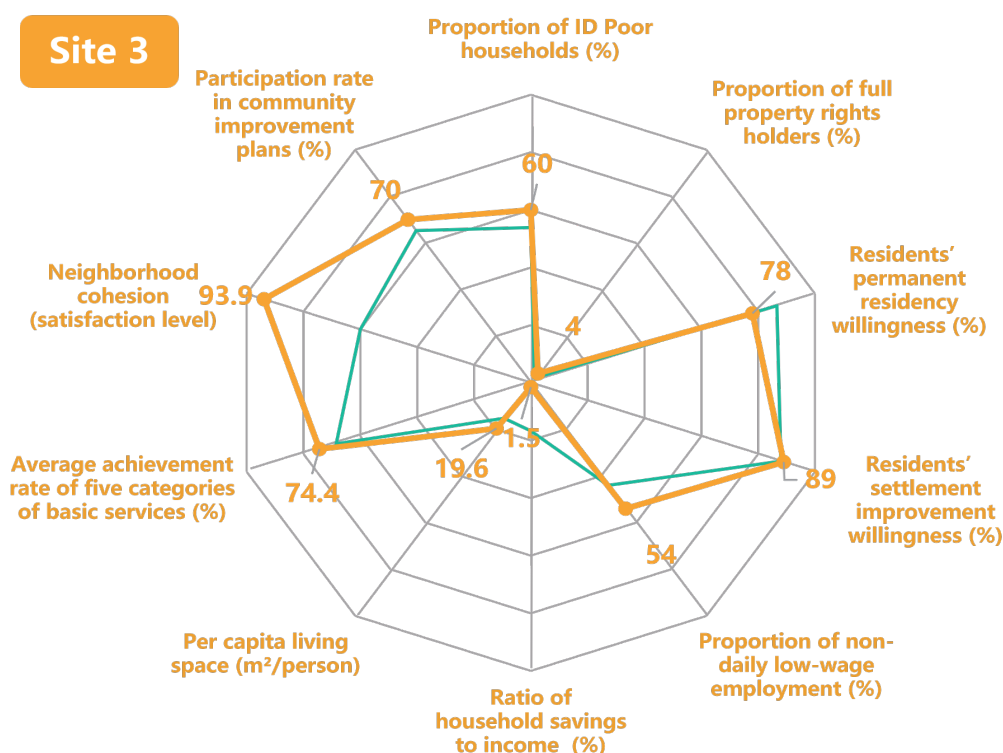


Figure 2.18 Radar Chart of Development Evaluation for Site 3

Environmental Quality (per capita space: 15.6m²). Although it has a relatively stable water and power supply infrastructure compared with other sites, it

suffers from a critical lack of drainage systems, with almost no organized drainage facilities on-site (Figure 2.20).

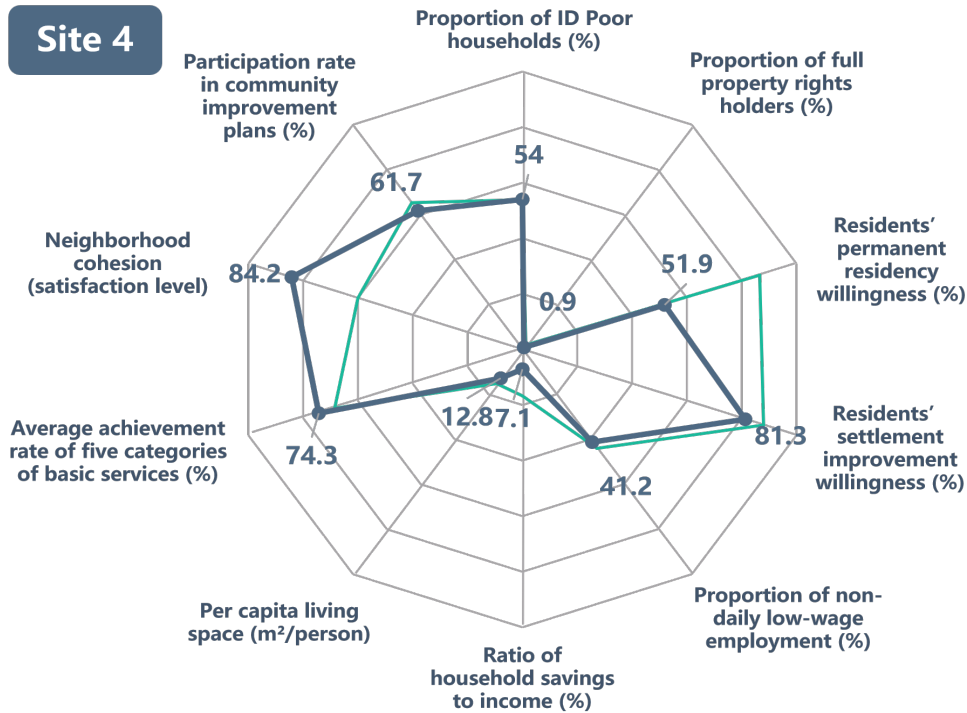


Figure 2.19 Radar Chart of Development Evaluation for Site 4

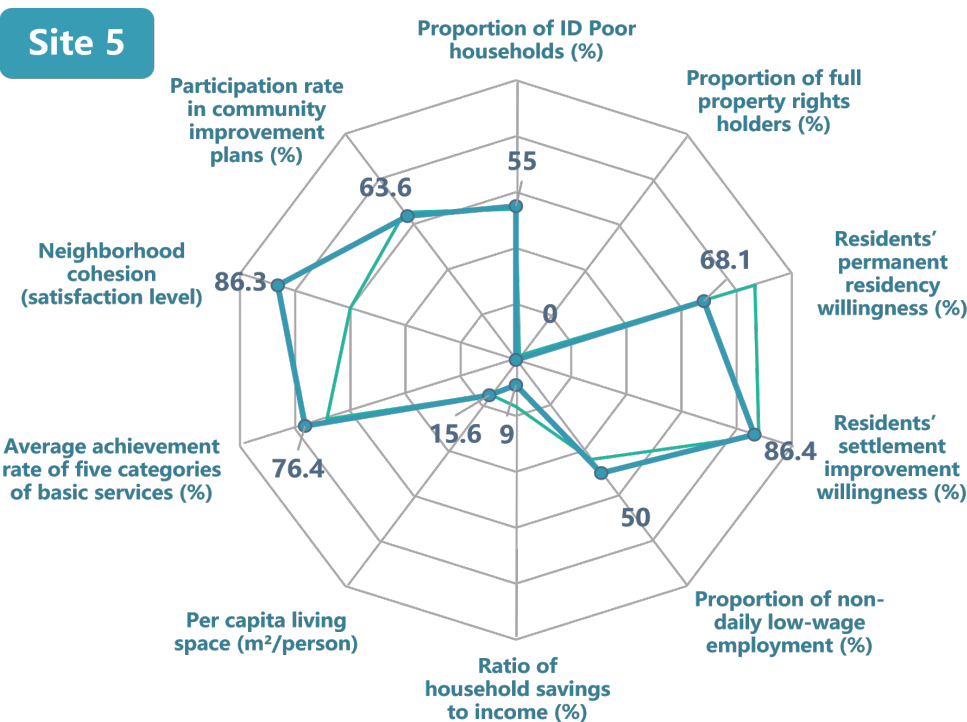


Figure 2.20 Radar Chart of Development Evaluation for Site 5



CHAPTER

3

GOVERNANCE EXPLORATION: A SUSTAINABLE AND INCLUSIVE STRATEGIC FRAMEWORK AND ACTION PLAN



3.1 “Five -Dimensional Capacity” Development Strategy Framework

This research integrates the theories of human settlement science, organic renewal, and Nature-based Solutions (NbS) to establish a multi-theoretical supporting system for the governance of informal settlements. First, the theory of human settlement science regards settlements as a giant system coupled with natural, humanistic, social, residential and supporting subsystems. It aims to achieve multi-dimensional sustainable development of human settlements through systematic coordination. Second, the organic renewal theory emphasizes respecting the spontaneously formed spatial texture of settlements. It recommends adopting “acupuncture-style” micro-renewal instead of large-scale demolition and reconstruction, so as to improve environmental safety while preserving low-cost livelihood spaces. Finally, Nature-based Solutions (NbS) enhance settlement resilience by leveraging ecological processes, providing a low-cost and highly adaptive collaborative pathway for the governance of ecologically sensitive areas.

This framework is designed in response to the survey findings on informal settlements in Preah Sihanouk Province. These settlements are charac-

terized by weak livelihood foundations but strong endogenous dynamics, as well as differentiated development challenges. The framework is guided by the core values of the three major UN initiatives, including spatial justice, social inclusion, environmental resilience, and economic prosperity, and integrates the systematic perspective of Human Settlements Science. The framework is built around five interconnected pillars. First, it protects residents’ basic rights and safeguards the fundamental baseline of community life. Second, it improves living conditions through small-scale renewal interventions. Third, it strengthens local initiative by bringing in social resources. Fourth, it consolidates the foundation for development by addressing infrastructure deficits. Finally, it supports the long-term sustainability of governance outcomes through multi-stakeholder co-governance. Guided by this logic, the “Five Capacities” Development Strategy Framework is constructed to cover the five interrelated sub-systems of human, residential, support, natural, and social dimensions, with the overarching goal of realizing the transformative leap from “survival” to “development” (Figure 3.1).

The specific composition of the framework is as



Figure 3.1 Strategy Framework

follows:

The Human Sub-system enhances residents' well-being through empowerment. By safeguarding housing rights and endowing space-sharing rights, residents are transformed into active participants in governance. Ultimately, through rights protection and spatial empowerment, it aims to substantially improve residents' sense of belonging, dignity, and happiness.

The Residential Sub-system fosters endogenous transformation capacity through planning. By implementing planning guidance at the overall coordination level and modular support for reconstruction at the implementation level, it addresses the challenges of substandard housing quality and unregulated transformation in informal settlements. This enables residents to proactively improve their living conditions with the necessary capabilities and resources under planning guidance and with technic support.

The Support Sub-system activates poverty alleviation and development capacity through collaboration. By improving the urban infrastructure system and integrating social resource

systems, it aims to unlock residents' potential to gradually escape poverty, create employment opportunities, expand livelihood sources, and lay the foundation for economic self-reliance.

The Natural Sub-system strengthens natural adaptability through nature-based approaches. In response to the high-risk reality that informal communities are often located in ecologically sensitive areas, Nature-based Solutions (NbS) are adopted to enhance community resilience against climate risks and promote harmonious coexistence between humans and nature.

The Social Sub-system unleashes collective co-governance capacity through co-governance mechanisms. Serving as the overarching governance guarantee integrating all the aforementioned subsystems, it establishes a full-cycle multi-stakeholder co-governance approach covering "needs assessment, planning formulation, and implementation governance". This unites scattered individuals into an action-oriented and responsible governance community, ensuring the fairness and sustainability of governance outcomes.

3.2 “Targeted Entry Points, Small-Scale Quality” Action Plan

To effectively enhance the efficacy of community governance, the action plan approaches the task through the lens of strengthening “Five Capacities”, while strictly adhering to the following four implementation principles: (1) Necessity: Rights-based and development-oriented. Facility upgrading should be regarded as an essential obligation to safeguard residents’ basic right to housing and right to development. (2) Urgency: Risk prioritization and progressive advancement. In highly vulnerable risk domains, such as climate adaptation and public health, progressive governance should be adopted, ranging from emergency response to long-term resilience building. (3) Consensus: Multi-stakeholder governance and locally led development. Community negotiation and multi-stakeholder collaboration mechanisms should be strengthened to enhance the legitimacy, community acceptance, and sustainability of planning solutions. (4) Affordability: Resource optimization and phased investment. Priority should be given to “small-scale quality” livelihood projects, with phased investment used to promote gradual community improvement.

3.2.1 Fostering endogenous renewal capacity and building a long-term self-governing community

Action 1: Functional Space Improvement Initiative

(1) Action objectives

This initiative adopts a toolkit to promote micro-scale spatial renovation. It guides residents’ spontaneous and scattered self-repair and self-construction activities in the settlement into organized, designed and collaborative improvements. While respecting the existing spatial pattern and social customs, it meets residents’ personalized demands for housing functions and

supports daily life and small-scale livelihood activities. It responds to Core Strategy II in the residential dimension: providing an accessible, affordable self-renovation toolkit.

(2) Action rationale

This initiative responds to the spatial dilemmas under the high-density collage form of informal settlements and residents’ strong demand for housing space upgrading. Taking Survey Site 5 Coast (Poy Kamping) as an example, buildings are densely arranged with almost no traditional buffer spaces. Daily activity space is limited, restricting the development of small-scale livelihood activities.

(3) Action plan

This initiative takes Survey Site 5 Coast (Poy Kamping) as a demonstration pilot. Based on an analysis of existing spatial usage, informal business types, family structures, livelihood facility demands (storage, display and production spaces), and residents’ functional needs, an open-source, modular, low-cost and user-friendly Vitality Interface Toolkit (Table 3.1) is compiled for vertical spaces and street frontages, integrating materials, techniques and design guidelines. It consists of a livelihood support module and a function enhancement module, enabling residents to carry out renovations independently or with simple technical guidance.

Techniques and materials in the toolkit prioritize locally available, low-cost and recyclable options. All renovation solutions are simple to implement without sophisticated machinery or professional expertise. The livelihood support module includes modular movable display racks, foldable workbenches, ventilated storage cabinets and retractable awnings. The function enhancement module comprises flexible partitions (sliding or roller shutter type), daylighting and ventilation windows, elevated storage lofts and wall-mounted storage shelves.

Table 3.1 Examples of the Vitality Interface Toolkit

Category	Purpose	Tools
Livelihood support module	To transform the street-facing side of residential space into a multi-functional commercial interface and support small and micro livelihoods.	Height-adjustable display rack / workbench: designed for households operating businesses in front of their houses, supporting various commercial activities such as catering, tailoring and retail.
	To improve semi-public spaces at the front or side of dwellings, providing shading, social interaction and space for simple daily activities.	Bamboo or waterproof fabric awning: offers shade for commercial operations and neighborhood communication.
		Three-dimensional shelf system: suitable for retail households with highly cramped indoor spaces; it makes full use of the vertical height from wall to ceiling and integrates storage, display and sales functions.
Function enhancement module	To increase storage capacity in limited spaces and improve the quality of living and production environments.	Lightweight timber frame system: facilitates the construction of attics, mezzanines and wall-mounted storage structures, freeing up ground-level space for daily activities, storage and small businesses.
		Vertical wall storage system: consisting of hooks, mesh panels and partition boards made of simple materials to maximize the utilization of wall space.

3.2.2 Enhance Residents' Well being and Build a Shared Happy Home

Action 2: Public Space Renovation Initiative

(1) Action objectives

This initiative adopts acupuncture-style micro space interventions to turn negative leftover spaces within the settlement into positive community assets. It aims to expand public activity spaces, strengthen community cohesion, and heighten residents' sense of belonging and identity through culturally distinctive design, thereby achieving a transition from spatial mending to community confidence building. This initiative responds to Core Strategy II of the humanistic dimension: reshaping interpersonal communication and mutual respect, and tapping marginal spaces to revitalize community vitality.

(2) Action rationale

This initiative is formulated to eliminate potential safety hazards and respond to residents' strong aspiration for improved public spaces. Taking Survey Site 1 Railway (Village Boeng Veng) as an example, the settlement sprawls along the railway with extremely high building density and lacks

formal public gathering spaces. Residents have to socialize in dangerous gaps alongside the railway tracks. Nevertheless, local residents commonly plant flowers and other greenery around their houses, and hold a strong desire to upgrade public interaction spaces and the overall community environment.

(3) Action plan

This initiative focuses on demonstrative renovation at Survey Site 1 Railway (Village Boeng Veng). Taking residents' spontaneous greening practices as the starting point for community participation, prioritizing safety as the fundamental premise, and creating locally featured public nodes as the core goal, it transforms passive leftover spaces into positive assets that facilitate social interaction and strengthen communal identity.

Four specific measures are proposed. First, revitalize the buffer zone along the railway by installing movable planters and benches to create safe pocket spaces (Figure 3.2). Second, optimize alleyways and spaces around residential buildings by installing foldable tables and vertical greening facilities to improve living conditions and the social environment. Third, activate idle marginal spaces within the community by clearing waste and setting up enclosures to provide recreational and leisure areas for

children and the elderly (Figure 3.3). Fourth, design cultural identity markers by inviting residents to paint traditional patterns and village stories on community

surfaces and designing distinctive house number plates for each household to strengthen their sense of belonging.



Figure 3.2 Schematic Diagram of Revitalizing the Railway Buffer Zone



Figure 3.3 Schematic Diagram of Renovation Case⁶

6. Reference case: Micro-renewal of “Zhanqian Huajie” Community in Wuhan-Using old bricks and tiles to build flower beds, encouraging residents to adopt and plant, and beautifying the environment at low cost.

3.2.3 Unleashing development dynamics for poverty alleviation and building a resource-sharing community

Action 3: Resource Platform Development Initiative

(1) Action objectives

This Initiative aims to break the “information silos” and “service vacuum” plaguing informal settlements, and establish a service center integrating public service administration, vocational skills training and livelihood support. It seeks to unleash community endogenous dynamics and interrupt the intergenerational transmission of poverty. Aligned with Core Strategy 2 under the Support dimension, this measure focuses on unleashing endogenous dynamics by strengthening economic, financial, and other soft infrastructure support. In doing so, it helps reduce settlement vulnerability and sustain long-term governance outcomes.

(2) Action rationale

The formulation of this Initiative targets the capacity gaps and information barriers faced by residents of informal settlements. Households in these settlements generally live in poverty, lack access to relevant information channels, and have insufficient awareness of long-term planning in health, education, safety and other fields. Despite their proximity to employment opportunities, residents remain caught in a persistent poverty trap due to the absence of effective job-matching mechanisms and skills training.

(3) Action plan

A community-embedded, trust-based and empowerment-oriented “one-stop” service team will be established to proactively deliver public services, market opportunities and development knowledge to residents’ households. The core objective is to build a sustainable endogenous support system, assist residents in identifying and leveraging their geographical locational advantages, and gradually lift them out of poverty through capacity enhancement and resource linkage. This initiative is composed of four core components. The first is the establishment of a

“1+2+N” service team. A tripartite governance framework will be developed in which local authorities take the lead and grant authorization, NGOs offer professional support, and community volunteers and residents carry out grassroots implementation. Second, a service delivery model will be optimized. Leveraging permanent liaison stations, door-to-door services, mobile workshops and tailored support are provided to ensure targeted resource allocation to densely populated and information-isolated households.

Third, core service contents will be clarified. Focus is laid on popularizing health, education and financial literacy knowledge, while skills training, employment brokerage and entrepreneurship support are offered. One-stop public services and disaster prevention training are also provided to comprehensively improve residents’ social adaptability and poverty resilience.

Action 4: Public Water and Electricity Access Initiative

(1) Action objectives

This initiative adopts an integrated policy-and-technology approach to upgrade water and electricity supply systems in informal settlements. It aims to diversify sources of electricity and piped water through low-cost technical interventions, improve the reliability of water and electricity services to meet residents’ basic living needs, and support the connection of informal settlements to municipal water and power grids through policy measures. This Initiative aligns with Core strategy 1 of the Support Sub-system-upgrading municipal infrastructure, improving mobility and transport conditions, and addressing the most basic safety, health and functional challenges of informal settlements.

(2) Action rationale

This Initiative is formulated in response to the unstable water and electricity supply in informal settlements and residents’ aspirations for improved utility services, with a view to achieving equitable access to basic water and power resources for all residents. Households in informal settlements generally suffer from erratic drinking water and electricity supply: residents are forced to dig wells or obtain tap water illegally from formal settlements, while power outages occur seasonally. As access to

water and electricity constitutes a basic livelihood necessity, a comprehensive upgrade of service levels and continuous improvement of infrastructure resilience are imperative.

(3) Action plan

Flexible and innovative technical solutions will be adopted to weave lifeline services (water, electricity and other essential utilities) into the existing fabric of the settlements. Three specific measures are proposed in this action. First, water and electricity networks will be laid synchronously with the improvement of settlement roads to connect to the municipal utility grid system. Second, on-site wells will be constructed to augment tap water supply in line with local conditions. Third, solar power systems will be introduced leveraging favorable solar

irradiance conditions.

Improved water and electricity supply will enhance human settlement quality while improving lighting and safety across the settlements. The drinking water supply component will be piloted at Survey Site 3: Coast (Village 1) where a community-wide water supply network is established to upgrade the level of basic supporting facilities in the community by constructing water supply pipelines along roads (Figure 3.4). The solar power supply component will be piloted at Survey Site 4: Railway (Village 3) where the community's energy supply is improved and residents' electricity costs are reduced by constructing a distributed photovoltaic power supply system (Figure 3.5).



Figure 3.4 Schematic Diagram of Tap Water Supply System



Figure 3.5 Schematic of Solar Photovoltaic Panels and Solar Street Lamps

Action 5: Road Space Upgrading Initiative

(1) Action objectives

This initiative aims to address gaps in the existing infrastructure, and develop a functional, safe, accessible and sustainable internal road network. Through the implementation of a series of interventions including boardwalk network development, road surface hardening and greenway retrofitting, the convenience and safety of residents' daily mobility will be tangibly improved. It will also strengthen connectivity between informal settlements and urban arterial road networks and public transport nodes, thereby breaking the physical segregation between informal settlements and mainstream urban functions. Beyond resolving basic mobility challenges, this process seeks to expand residents' opportunities for social participation and economic inclusion, laying a solid foundation for the transformation of informal settlements into liveable and resilient communities.

(2) Action rationale

This initiative is established in response to the urgent demand of residents for road upgrading and renovation. Waterfront stilted boardwalk zones: Residents primarily travel by simple plank paths. Existing boardwalks are mostly isolated linear structures with poor interconnectivity, vulnerable to damage and pose collapse risks, failing to meet basic needs for daily mobility, emergency evacuation and rescue operations. In railway-side zones, residents navigate narrow spaces along railway verges. Roads are mostly unpaved earthen tracks, with mixed pedestrian-vehicular traffic and proximity to railway

tracks. This creates concurrent risks of traffic accidents and railway safety incidents. These transport constraints not only hinder residents' access to basic services such as employment, education and healthcare, but also deepen their spatial and social marginalization.

(3) Action plan

To develop a highly connected, safe and sustainable mobility corridor system, the following four specific interventions are proposed for Survey Site 3: Coast (Village 1) and Survey Site 1: Railway (Village Boeng Veng): First, establish an interconnected boardwalk network by adding vertical and horizontal links to form a loop-based system. Main passages should be at least 1.5 meters wide, and branch passages at least 0.7 meters wide, improving traffic efficiency and disaster resilience (Figure 3.6). Second, reinforce the boardwalks using corrosion-resistant and durable materials. Strengthen pile foundations and supporting structures, and install guardrails along waterside sections and turning points to prevent safety accidents.

Third, harden earthen main roads to reduce mud on rainy days and dust on sunny days, while improving travel comfort and lowering maintenance costs (Figure 3.7). Fourth, renovate greenways by using idle land and waterfront areas to create pedestrian and non-motorized corridors, with greenery, lighting, and rest areas added for public interaction. Together, these measures will improve the accessibility and safety of the area's internal "capillary traffic network" and support residents' livelihood improvement and long-term development.



Figure 3.6 Schematic Diagram of Internal and External Road Network Renovation in Informal Settlements



Figure 3.7 Schematic Diagram of Road Surface Hardening and Greenway Retrofitting for Railway-Side Spaces

3.2.4 Enhancing natural adaptive capacity and building ecologically resilient human settlements

Action 6: Stormwater and Flood Disaster Risk Reduction and Mitigation Actions

(1) Action objectives

This action aims to explore a new model for stormwater and flood-resilient development in informal settlements. It adopts context-adaptive and ecologically based approaches to divert stormwater and establish dedicated stormwater runoff drainage corridors, ensuring “no waterlogging under light rainfall and minimal urban flooding under heavy rainfall”. It will comprehensively upgrade the community’s capacity for prevention, response and recovery from multiple climate-related hazards; significantly strengthen the overall climate resilience of the community; safeguard human lives, property and basic livelihood stability; and achieve the transformation from passive disaster resistance to proactive disaster prevention.

(2) Action rationale

This action is developed in response to the perennial disturbance of rainfall-induced waterlogging and the urgent demand of residents for improved drainage systems. Most informal settlements in Cambodia are located in low-lying areas and generally lack formal drainage systems and stormwater harvesting facilities. These settlements feature dense and

unplanned built environments, where drainage channels are frequently clogged, further blocking natural drainage paths and exacerbating flood risks. As climate change intensifies and extreme rainfall events become more frequent, the limited coping capacity of informal settlements has further exposed their vulnerability to drainage failures and flood risks. Meanwhile, flooding often causes septic tank overflows and waste scattering, polluting the living environment, increasing the risk of waterborne infectious diseases, and imposing severe impacts on the livelihoods and health of residents in informal settlements.

(3) Action plan

To improve resilience to rainstorm-induced waterlogging, this initiative proposes three specific measures, using Survey Site 1–Railway, Village Boeng Veng–as an example. This initiative puts forward the following three specific measures: First, construction of the rainstorm and flood resilience system. Following the ecological concept of “source reduction, process control and systematic governance”, and combining the natural vertical terrain conditions of the site, low-impact development technologies such as infiltration, retention, storage, purification, utilization and drainage are systematically adopted. Scattered green spaces, marginal plots and narrow passages within the residential area are transformed into multi-functional sponge bodies. Building on these interventions, a multi-level ecological drainage corridor system closely integrated with terrain, transportation networks and residential spaces is established (Figure 3.8, Figure 3.9). This network enables

more effective stormwater runoff management and supports the collection, storage, and reuse of rainwater.

Second, improvement of housing resilience under extreme climate conditions. Low-cost technical measures including technical training and demonstration roof reinforcement are promoted, and community mutual-aid groups are set up to give priority to assisting vulnerable households such as the elderly living alone and families with disabilities in completing renova-

tion works. Third, capacity building for early warning and emergency response in residential areas. A multi-channel early warning communication network is established to ensure timely delivery of warning information to every household. A comprehensive emergency plan is formulated to clarify evacuation routes and shelters, with regular emergency drills organized. Material reserve depots are set up at safe locations to stock emergency supplies such as emergency lighting and first-aid kits, consolidating the foundation of community disaster prevention and mitigation.



Figure 3.8 Schematic Layout of Ecological Drainage Corridors



Figure 3.9 Schematic Diagram of Ecological Ditch Renovation

Action 7: Ecological Environment Improvement Actions

(1) Action objectives

This action aims to explore a new model for collaborative ecological governance of informal waterfront settlements. Through ecology-based governance approaches, this measure promotes integrated regional environmental improvement by reducing water and solid waste pollution, improving the human settlement environment and public health conditions, and ensuring the effective collection and treatment of wastewater. It also strengthens the orderly management of solid waste and maintains safe, unobstructed drainage corridors.

(2) Action rationale

This action is formulated to address the impacts of environmental sanitation conditions on the health, well-being and quality of life of settlement residents. Informal settlements in coastal areas of Cambodia generally lack drainage pipeline networks and solid waste collection systems. The direct discharge of domestic wastewater and solid

waste into the environment has led to continuous degradation of the human settlement environment and the ecological status of adjacent water bodies, posing persistent threats to residents' health and the surrounding ecological environment.

(3) Action plan

Guided by the core principles of "source reduction, in-process purification, systematic restoration, and land-sea integrated coordination," this plan addresses direct wastewater discharge, waste accumulation, silt blockage, and water degradation in informal settlements. It develops systematic governance measures ranging from pollution control to ecological restoration, achieving the coordinated improvement of human settlements and the aquatic ecological environment (Figures 3.10 and 3.11). This initiative proposes four specific measures: establishing an ecological multi-level sewage purification system, creating eco-friendly waterfront spaces with good water quality, implementing a whole-process solid waste management model, and constructing naturally resilient rainwater drainage corridors.

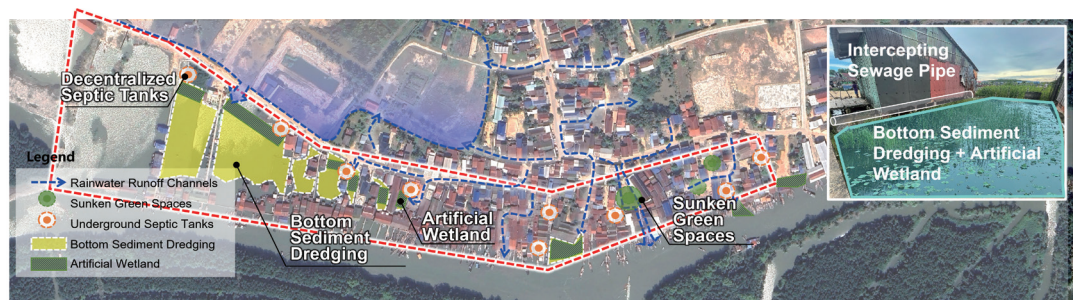


Figure 3.10 Schematic Layout of Ecological Environment Improvement Facilities

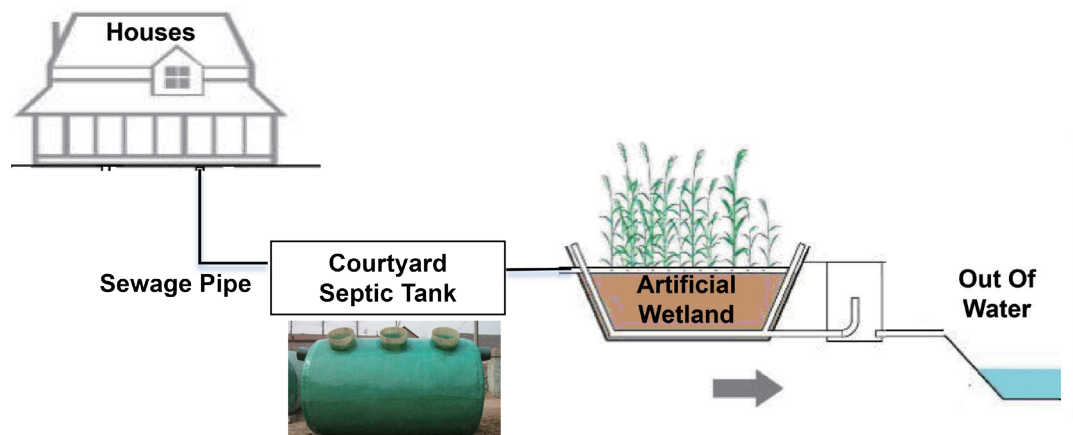


Figure 3.11 Schematic Diagram of Multi-Level Wastewater Purification System

3.2.5 Unleashing the collective power of co-governance and innovating a home for co-governance and shared benefits

Action 8: Community Planner Empowerment Initiative

(1) Action objectives

This initiative aims to enhance grassroots governance capacity and strengthen the enabling role of community planners in integrating multi-stakeholder resources, building negotiation platforms, and promoting public participation. It will cultivate local core talents for the community to achieve independent decision-making, long-term management and spatial upgrading, in response to Core strategy 2-Social dimension.

(2) Action rationale

This initiative is developed in response to residents' strong willingness to participate and their profound expectation for government-community collaboration. 80% of residents believe that

"government and community support and cooperation" is the key to the success of renovation. The current challenge is the lack of effective community organizations. Residents remain fragmented and therefore need institutional support to become better organized.

(3) Action plan

This initiative will implement the community planner system to explore a new governance path that empowers grassroots communities with professional expertise and promotes the sustainable development of informal settlements through multi-stakeholder collaboration. The specific implementation plan is as follows: Establishment of the operational mechanism. Led by municipal and district planning authorities, a recruitment and appointment program for community planners is jointly launched in collaboration with local communities. Stable pairing relationships are established between communities and community planners. Planners may be assigned by municipal and district planning authorities, recruited for communities by international organizations, or selected from within the local community. This forms a 1+N collaborative working network centered on community planners.

BOX: Case Study of Empowering Old Community Governance through "Targeted Entry Points and Co-Participation" (Huaqing Community, Wuhan, China)

The City of Wuhan promoted the responsible planner system through "co-construction and co-creation" practices, exploring a new governance path that empowers grassroots with professional strength and promotes the sustainable development of old communities through multi-stakeholder co-governance.

1. Building a multi-stakeholder collaborative responsible planner team

Led by Wuhan Urban Planning and Design Institute, a team with diverse backgrounds including planners, architects and landscape architects was publicly recruited. It established stable service relationships with sub-districts

through "paired sinking", laying the foundation for in-depth community engagement.

2. Adopting accompaniment-oriented and platform-based working methods

Responsible planners abandon the traditional approach of "planning on behalf of residents". Through field surveys, resident meetings, open days and other activities, they build multi-stakeholder communication platforms, accurately identify pain points, transform residents' needs into "micro-renovation" topics, and promote the formation of systematic renewal plans such as "Planing Li" (Figure 3.12).



Figure 3.12 Schematic Diagram of "Planing Li Block" in Huaqing Community

3. Promoting multi-stakeholder public participation with a people-centered approach

Community forums and community open days were adopted to involve community residents in planning and design. Focusing on the comprehensive improvement of ecological, commercial, cultural and other systems with the joint participation of multiple stakeholders, the transformation of planning from blueprint design to whole-cycle community governance has been realized. (Figure 3.13).

4. Focusing on community capacity building

and sustainable governance

With a focus on nurturing endogenous community forces during project implementation, by assisting in the establishment of residents' self-management groups, they promote the establishment of long-term maintenance mechanisms. Meanwhile, the team actively communicates with government departments to incorporate community planning into implementation plans, enhance project feasibility, and achieve the leap from spatial renewal to governance capacity improvement (Figure 3.14).



Figure 3.13 Meetings with Huaqing Community Residents' Self-Management Groups and Responsible Planners



Figure 3.14 Comparison Before and After Renovation

5. Forming promotable governance experience and insights

The practice of Huaqing Community shows that the responsible planner system emphasizes the integration of professional expertise and public opinion, enhances the quality of living

environment, and empowers grassroots governance. Attaching equal importance to renewal and governance, it serves as an effective path to promote the high-quality development of old residential communities.



CHAPTER

4

GUARANTEES FOR ACTION AND GLOBAL IMPLICATIONS



4.1 Action Matrix and Guarantee Mechanism

Guided by an evolutionary logic of “Safety First, Quality Enhancement Second, Governance Consolidation Last”, we construct an action matrix characterized by layered coordination and progressive transition. By translating macro-level objectives into specific project packages and

quantifiable metrics, renovation tasks are precisely cascaded down to every residential community, thereby ensuring that “intervention by targeted entry points” projects yield tangible and positive governance outcomes.

Table 4.1 Phased Action Matrix

Phased objectives			Action modalities	Action plan	Monitoring indicators
Phased actions	Foundational stage (1-2 years)	Basic provision and risk prevention & control	International aid and support modality (See Column 2)+Government-led implementation	Development capacity: Access to public water and electricity (Action 4) Safe accessibility (Action 5) Resilience capacity: Stormwater and flood control (Action 6)	Average achievement rate of five categories of basic services (%) Participation rate in community improvement plans (%) Resident willingness to reside permanently (%)
	Intermediate stage (2-4 years)	Quality improvement and capacity development	“Co-design, co-benefit and co-responsibility modality” (See Column 2)+Community collaborative implementation	Endogenous capacity: Functional spaces (Action 1) Development capacity: Resource platform (Action 3) Resilience capacity: Environmental governance (Action 7)	Proportion of full property right holders (%) Resident willingness to upgrade settlements (%) Per capita floor area (m ² / person)
	Advanced stage (4-6 years)	Sustainable development and governance innovation	Low-profit sustainable modality (See Column 2)+Community self-governance	Well-being capacity: Public spaces (Action 2) Collective capacity: Governance mechanisms (Action 8) Economic activities Cultural Identity	Cohesion of neighborhood relations (satisfaction level) Proportion of non-daily low-wage employment (%) Proportion of household savings in total income (%) Proportion of households with ID poor (%)

BOX 1: Cases of Action Models

1. “Co-planning, co-sharing, co-bearing” Model (Guangzhou, China-Community renewal practice)

A community collaboration mechanism of “Co-planning, co-sharing, co-bearing” has been established:

(1) Co-planning: Residents participate in the planning and decision-making process by voting on proposed schemes, submitting project proposals, and expressing their needs.

(2) Co-sharing: Society and the community form a mutually beneficial alliance to share the fruits of renovation in terms of regional economic development, industrial upgrading, and public space improvement.

(3) Co-bearing: On the basis of clarifying the division of powers, responsibilities and interests, property owners share the renovation funds in different proportions, giving full play

to their subjective initiative and enhancing the sustainable motivation for community renovation.

2. Low-profit sustainable model (Jinsong Community model, Wuhan, China)

Through the collaboration of three parties—enterprises, government, and residents—a model of “Basic guarantee + service operation + benefit sharing” has been constructed. The government invests in infrastructure (pipeline networks, barrier-free facilities, etc.) through fiscal funds; Vision Group (enterprise) is responsible for the renewal of public service facilities (canteens, health stations, etc.) and property services. Meanwhile, it achieves stable returns with rental income from existing space as the core (accounting for 46%), combined with diversified income sources to recover investment within 10 years. Only 2%–3% of the operating area is used to avoid excessive commercialization; Residents select property services through voting, enjoy services on a “try-before-you-buy” basis, and can participate in housing replacement and

rental. This model not only realizes housing renovation and community environment upgrading but also balances demand, efficiency and sustainability through the people-centered renovation logic (Figure 4.1).

The “Jinsong Model” is an innovative investment and financing mechanism for community renewal. Centered on “low-profit sustainability”, it attracts social capital to participate in renewal and property management, endows enterprises with the right to renovate and operate inefficient space, and secures stable cash flow through space operation, parking fees, property fees, and elderly care industries. On the investment side, special loans are obtained through the mortgage of operating rights. Enterprises only need 20% of their own funds, with 80% of the funds turnover through loans to ensure long-term operation. The renovation covers both hardware and software improvements: supplementing convenient functions, strengthening soft services, and targeting community needs to make the renewal more in-depth, precise and human-centered (Figure 4.2).



Figure 4.1 Layout Ratio of Service Formats in Jinsong Model

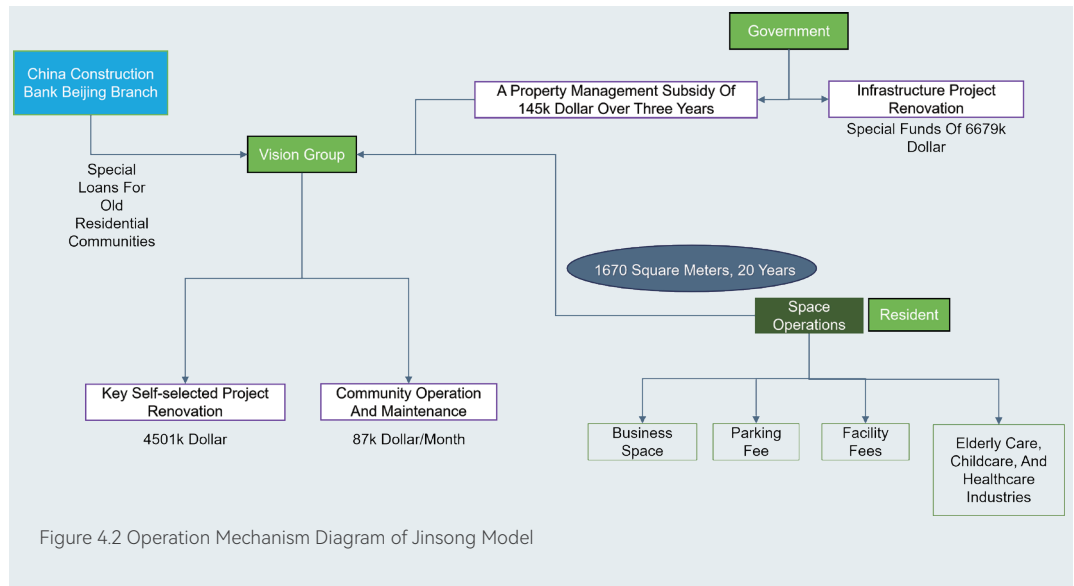


Figure 4.2 Operation Mechanism Diagram of Jinsong Model

Organizational support. A closed-loop organizational model shall be established, featuring planning coordination, multi-stakeholder collaboration and technical-driven mechanisms, providing systematic support and dynamic impetus for the renewal of informal settlements in Preah Sihanouk Province. With the “5C Working Method” (Communications, Change, Conflict, Creativity, and Coaching) as the core of collaboration, this model deeply integrates multi-stakeholders including the Cambodian government, international organizations, social groups and community residents, building a multi-governance structure with clear responsibilities and efficient linkage. At the technical level, it imple-

ments a closed-loop path from research, formulation, implementation to evaluation, promoting the integration of Chinese standards, Wuhan experience and local realities to form a complete and sustainable technical chain. At the implementation level, the model relies on a full-process support mechanism covering project planning, financial support, technical guidance, and public participation. It strengthens systematic governance capacity in informal settlement renewal by addressing urgent housing, facility, and environmental issues while building long-term development momentum for Preah Sihanouk Province through institutional improvement, technological support, and social participation (Figure 4.3).



Figure 4.3 Action Organizational Support under Planning Coordination

4.2 Implications and Prospects

4.2.1 Implications of governance

Drawing on China's experience, and integrating local realities in Cambodia, this study develops a replicable and scalable pragmatic incremental governance paradigm for informal settlements. It delivers three core implications for Southeast Asia and other Global South countries:

Implication 1: Restructuring governance logic, from “eviction-replacement” to “inclusion-symbiosis”

Traditional governance is often trapped in the binary dilemma of clearance or large-scale demolition. This research adopts a pragmatic approach of setting aside land titling disputes, prioritizing in-situ upgrading and on-site intervention. Practice has shown that recognizing the objective existence of informality and residents' agency is key to breaking the governance deadlock. By applying the Five Capacities development framework—well-being, endogenous capacity, development capacity, adaptive capacity, and collective capacity, top-down planning control is effectively integrated with bottom-up community demands. Settlement resilience is enhanced without confronting complex tenure issues, offering a new logical paradigm for the global transition of informal settlements from passive survival to proactive development.

Implication 2: Anchoring technical pathways, nature-based solutions (NbS) and acupuncture-style low-cost micro-renewal

Given the problems of inadequate infrastructure and limited funding, this research does not support costly large-scale demolition and reconstruction. Instead, it adopts low-tech, low-carbon, low-cost approaches such as ecological ditches, distributed photovoltaics, and modular toolkits. Such acupuncture-style intervention not only lowers implementation costs but also preserves original social networks and low-cost livelihood spaces within communities. It provides a highly adaptable technical blueprint for urban renewal in ecologically sensitive areas across developing countries.

Implication 3: Breakthrough in implementation

mechanisms, hierarchical collaboration and incremental action matrix

The research constructs an action matrix featuring “hierarchical collaboration and phased transition”. In the short term, international aid and government leadership rapidly make up infrastructure shortages. In the medium to long term, the mechanism of “co-creation, sharing, and shared responsibility” bridges policy gaps through community collaboration, supported by low-profit sustainable models and community self-governance. In the long run, the Social Land Concession (SLC) scheme further stimulates community self-development capacity. This mechanism effectively balances multi-stakeholder interests and provides operable implementation pathways for settlements at different development stages.

4.2.2 Prospect of transformation

Different from Latin America's path of costly legal land titling and Singapore's approach of eliminating informal settlements via public housing, this research is grounded in Cambodia's reality of weak institutions and strong capital. Setting aside disputes over land titling, it establishes a pragmatic governance logic of prioritizing in-situ upgrading and action intervention. Looking ahead, practices in Sihanoukville are expected to evolve from isolated project implementation toward systematic governance reform under the guidance of the Five Capacities framework. The focus should shift from project delivery to institutional consolidation, particularly promoting the implementation of the Social Land Concession (SLC) scheme and the formulation of community self-governance regulations. This will enable informal settlements to achieve a sustainable transition from passive survival to proactive development. The exploration in Sihanoukville is not merely a local governance practice in Cambodia, but also a Cambodian paradigm for advancing sustainable and inclusive governance of informal settlements. It demonstrates a viable alternative to the world: even in the most marginalized and vulnerable areas, resilient, humane, and dignified human habitats can be built through respect, inclusion, empowerment, and collaboration.

