

Towards a Sustainable and Water-Sensitive Krong Kratié, Cambodia.

Baseline Assessment

Findings and Strategy Development Annexes

September 2023



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About the PolyUrbanWaters Project and this report

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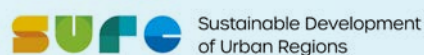
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Towards a Sustainable and Water-Sensitive Krong Kratié, Cambodia.

Executive Summary of
Baseline Assessment
Annexes

September 2023

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Annex I.

Overview of Distribution of Population and Densities in Different Sangkats

Sangkat	Village	Population (2020)	Area (km ²)	Density (population/km ²)
Koh Trong		1860	14,97	124,25
	Kbal Koh	970	10,53	92,12
	Chong Koh	890	4,44	200,45
Kra Kor		4189	14,81	282,85
	Kra Kor	3066	6,32	485,13
	Toul Monorom	1123	8,49	132,27
Kratie		6475	4,34	1491,94
	Daun Chraom	1528	0,44	3472,73
	Kratie	1540	0,51	3019,61
	Phsar Veng	666	0,82	812,20
	Trapang Pring	1709	0,5	3418,00
	Wat	1032	2,07	498,55
O'Russey		13111	32,47	403,79
	Kantreung	1074	2,65	405,28
	Kapo	2901	15,64	185,49
	O'Russey Ti Mouy	2565	1,11	2310,81
	O'Russey Ti P	2831	4,82	587,34
	Srae Sdao	3740	8,25	453,33
Roka Kandal		6208	24,83	250,02
	Ti Mouy	2976	16,53	180,04
	Ti Pi	3232	8,3	389,40
Total	Krong Kratie	31843	91,42	348,32

Table 1. Distribution of Population and Densities in Different Sangkats
(Source: National Institute of Statistics (NIS), 2020)

Annex II.

Drivers

Figure 1. Main Occupations in Kratié Municipality in 2020 (Source: Commune Database (CDB). 2020)

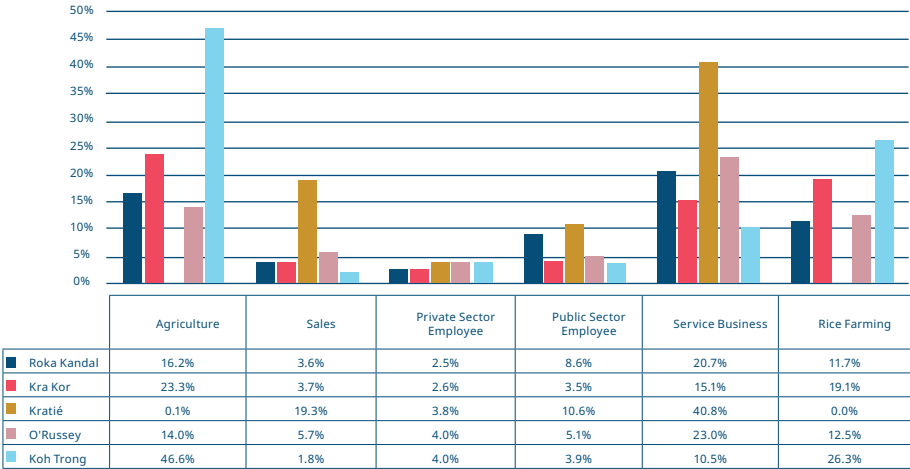


Figure 2. Fishing as Primary Occupation in Kratie. Males and Females over 17 Fishing Primary Occupation (Source: Commune Database (CDB). 2020)

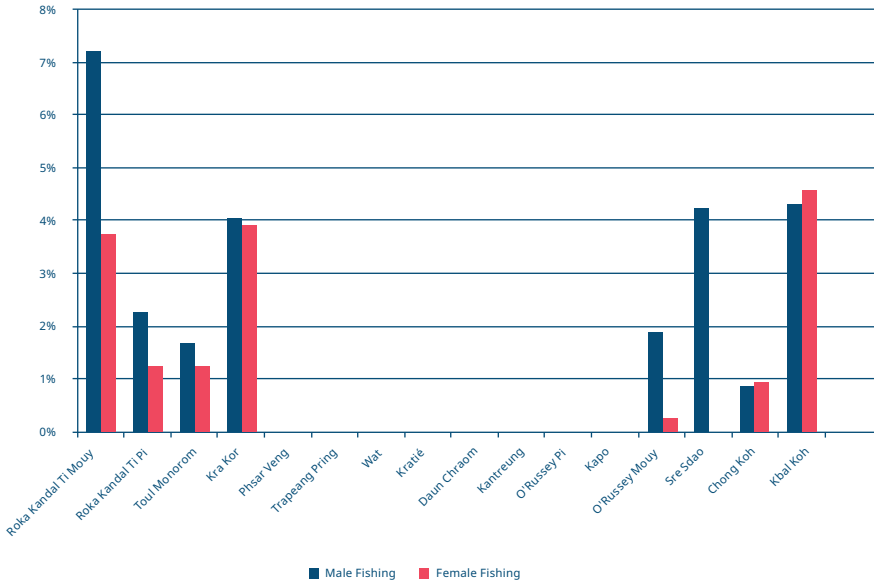


Figure 3. Types of Hospitality Business and Employees in Krong Kratié in 2020 (Source: Commune Database (CDB). 2020)



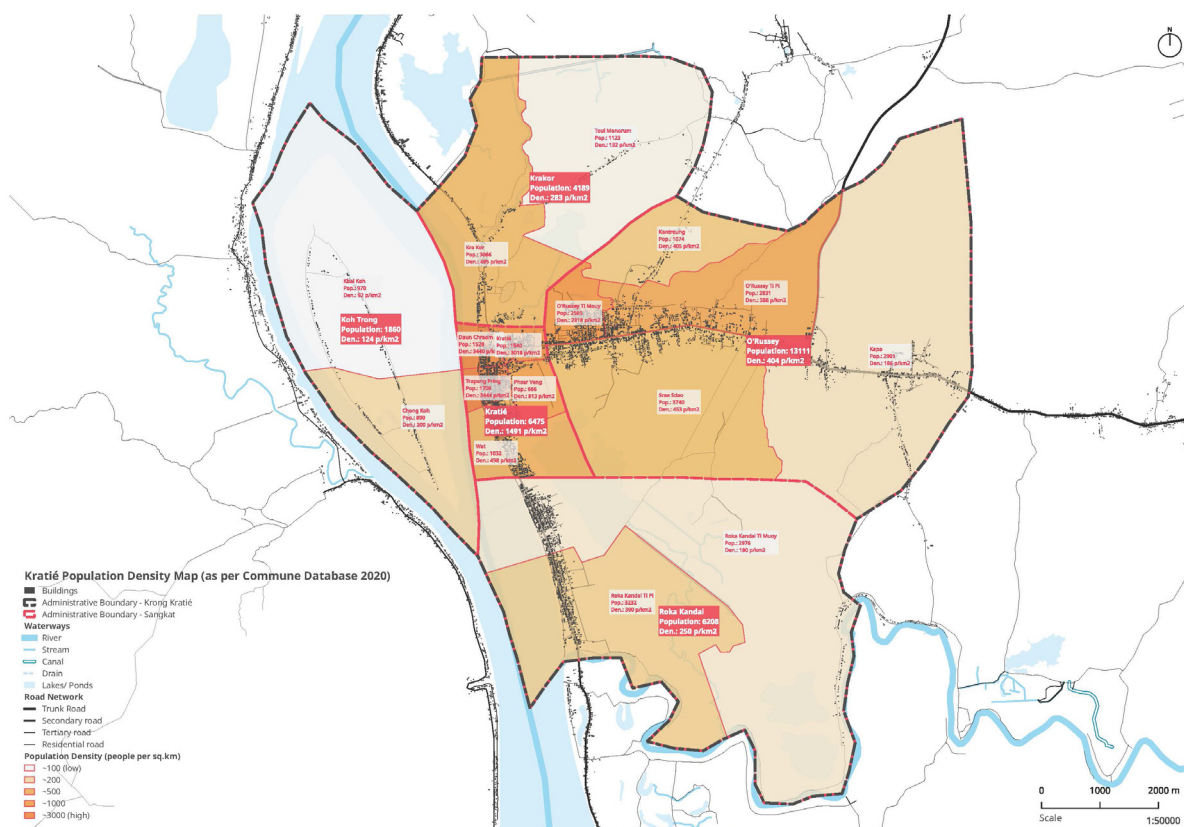
Annex III.

Urban Transformation – Additional Maps and Figures

	Area (ha)	% of total area
Krong Kratié Total	9286	100%
High Density Residential Area	326	3.5%
Medium Density Residential Area	485	5.2%
Low Density Residential Area	1206	13.0%
Agricultural Area	3360	36.2%
Green Spaces	175	1.9%
Mixed Commercial Area	13	0.1%
Commercial Area	11	0.1%
Public Facilities	43	0.5%
Administrative and Public Service Area	24	0.3%
Religious Sites	18	0.2%
Cemeteries	3	0.0%
Medium Industrial Area	117	1.3%
National Defense Area	15	0.2%
Reserve Area	1248	13.4%
Lakes/ Ponds	606	6.5%
Other	1636	17.6%

Table 2. Calculations of land uses in urban land use planning map of Krong Kratié for Vision 2030 (Source: Own Work, 2023)

Figure 4. Overview of population density in Krong Kratié and its villages (Source: Own Work, 2023)



Sangkat	Villages	Number of families		Family poor 1				Family poor 2				Total poor families			
Sangkat Koh Trong	Kbal Koh	227	448	4	2%	10	2%	35	15%	81	18%	39	17%	91	20%
	Chong Koh	221		6	3%			46	21%			52	24%		
Sangkat Kra Kor	Kra Kor	770	1067	25	3%	39	4%	74	10%	135	13%	99	13%	174	16%
	Toul Monorom	297		14	5%			61	21%			75	25%		
Sangkat Kratié	Daun Chraom	340	1554	53	16%	106	7%	30	9%	113	7%	83	24%	219	14%
	Kratié	380		10	3%			14	4%			24	6%		
	Phsar Veng	168		18	11%			28	17%			46	27%		
	Trapang Pring	385		23	6%			35	9%			58	15%		
	Wat	281		2	1%			6	2%			8	3%		
Sangkat O'Russey	Kantreung	254	3536	20	8%	216	6%	59	23%	417	12%	79	31%	633	18%
	Kapo	771		45	6%			90	12%			135	18%		
	Ti Mouy	754		64	8%			101	13%			165	22%		
	Ti Pi	785		25	3%			62	8%			87	11%		
	Srae Sdao	972		62	6%			105	11%			167	17%		
Sangkat Roka Kandal	Ti Mouy	668	1395	8	1%	26	2%	91	14%	193	14%	99	15%	219	16%
	Ti Pi	727		18	2%			102	14%			120	17%		
Totals		8000	8000	397	5%	397	5%	939	12%	939	12%	1336	17%	1336	17%

Table 3. Overview of sangkats, villages with total population and identified poor families (Source: RGC, 2022).

Figure 5. Examples of concrete, asphalt and masonry in urban core area (a,b,c) (Source: Own Photos, 2022)



a.



b.



c.

Percentage of Residential Housing Stock by Type

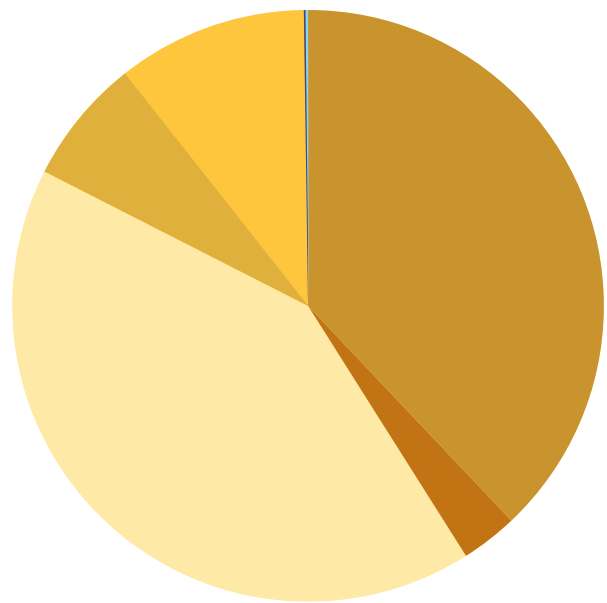
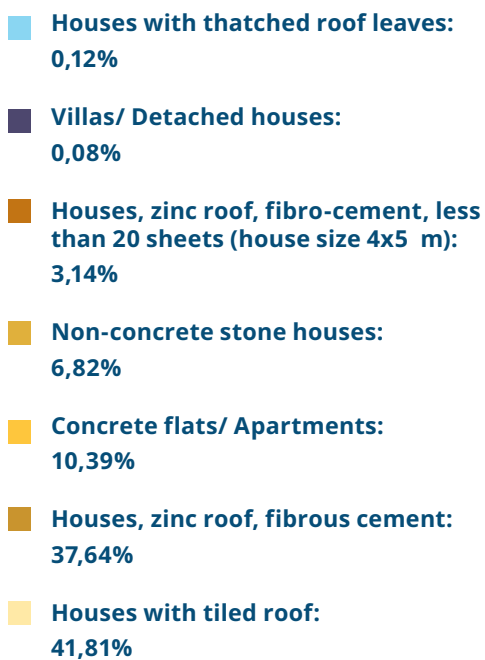


Figure 6. Residential housing by stock type
(Source: Commune Database (CDB), 2020)



Apartments: multi-story buildings containing individual housing units that are typically owned or rented by residents. Often constructed with reinforced concrete and/or brick masonry, these houses are considered medium-density housing.

Figure 7. Apartment blocks in urban core
(Source: Own Photo, 2019)



Figure 8. Apartment blocks in urban core abutting wetlands
(Source: Own Photo, 2019)

Criteria		# of Houses	% of Housing stock
1	Lacking durable housing of a permanent nature that protects against extreme climate conditions.	77	1%
2	Lacking sufficient living space which means not more than three people sharing the same room.	202	3%
3	Lacking access to safe water in sufficient amounts at an affordable price.	425	6%
4	Lacking access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.	274	4%
5	Security of tenure that prevents forced evictions as expressed by families without land titles (data CDB 2018).	4,827	68%

Table 4. Informal housing statistics in Krong Kratié (Source: CIUS, 2019)

Figure 9. Informal housing settlement Krong Kratié (Source: Smith, 2014)

Figure 10. Aerial image with demarcation lines of sangkats and villages (Source: Own Photo, 2022)



	2022 (existing)	2030 (planned ha)	Krong Kratié Total Area
Urban Core	712	712	
Planned Urban Extension + Industrial Area		995	
Reserve		552	
Agriculture	6166	4554	
Other	2263	2328	
Total			9141

Table 5. Comparison of changed land use (current and planned)
(Source: Own Work, 2022)

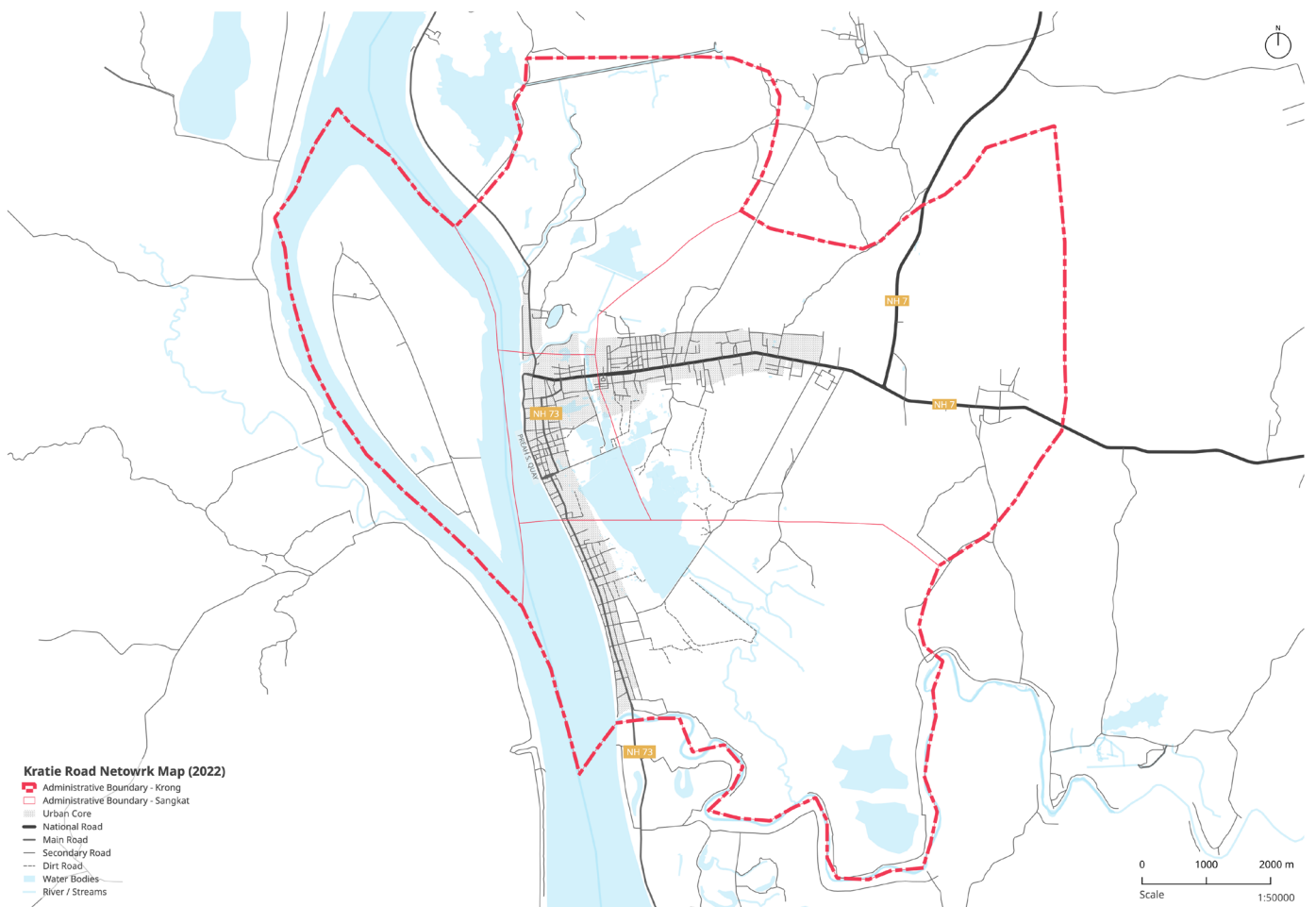
Figure 11. Street vendors and parking around market hall
(Source: Own Photo, 2022)





Figure 12. Mekong promenade with green embankment
(Source: Own Photo, 2023)

Figure 13. Existing road network of Krong Kratié
(Source: Own Work, 2023)



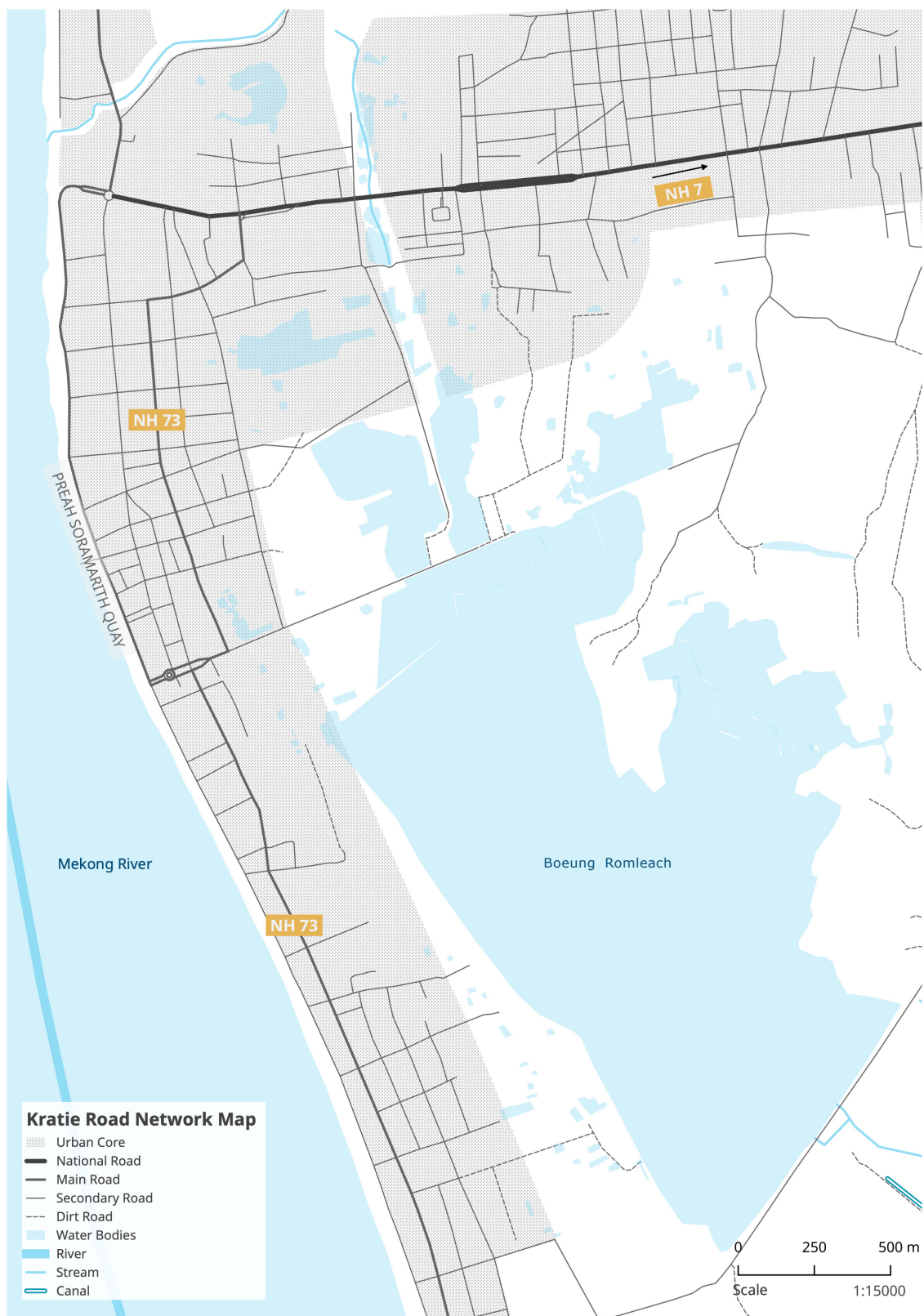


Figure 14. Road network in urban core and around Boeung Romleach
(Source: Own Work, 2023)

Figure 15. Typical type of access paths emanating from settlement road network of settlement area to Boeung Romleach (west bank)
(Source: Google Earth Pro 7.3.4.8573 (06/2021). Krong Kratié, Cambodia, Coordinates 12°28'04.36"N 106°1'48.36"E Elev 689m)

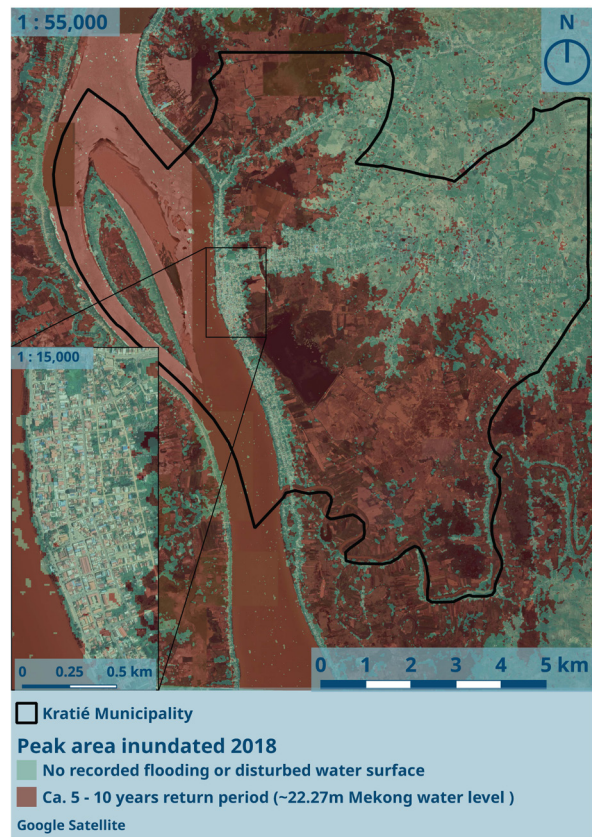


Figure 16. Typical access paths emanating from settlement road network of settlement area to Boeung Romleach (north-west bank)
(Source: Own Photo, 2023)



Annex IV.

Peak Inundated Areas by Year 2015 to 2022



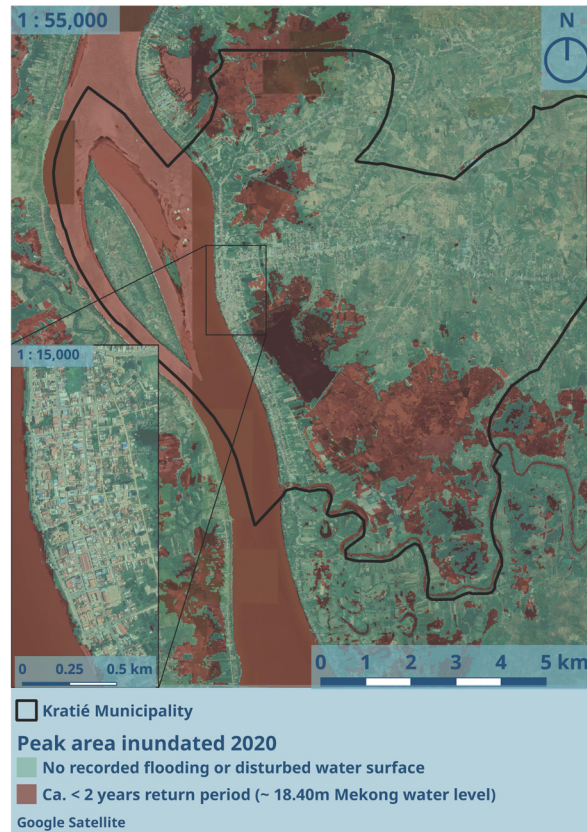
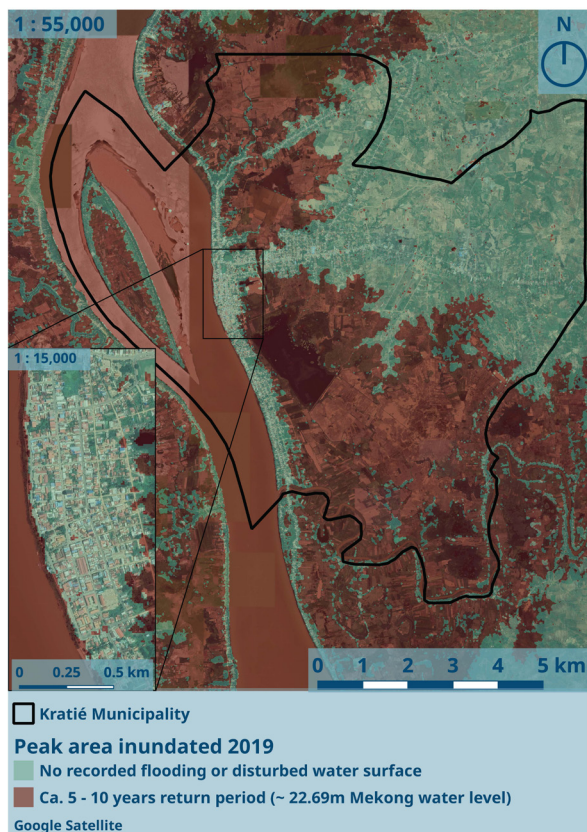


Figure 17. Peak Inundated Areas 2015

Figure 18. Peak Inundated Areas 2016

Figure 19. Peak Inundated Areas 2017

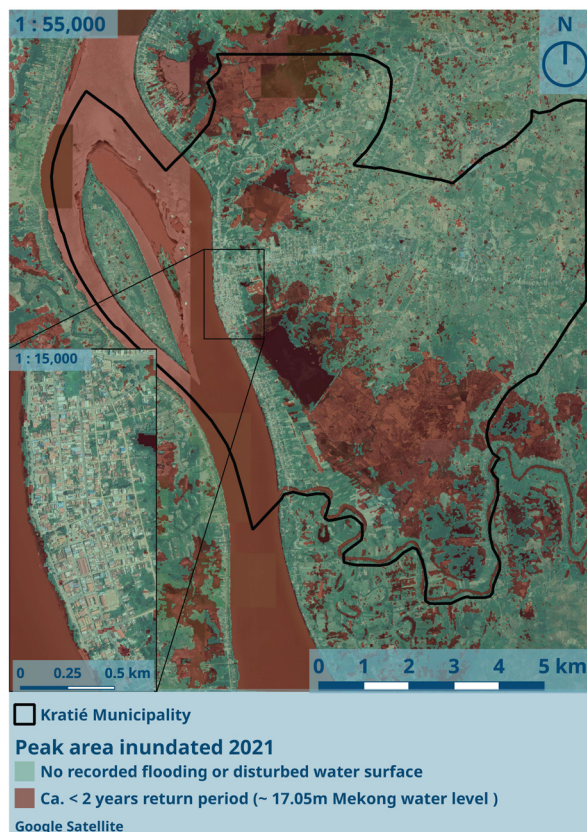
Figure 20. Peak Inundated Areas 2018

Figure 21. Peak Inundated Areas 2019

Figure 22. Peak Inundated Areas 2020

Figure 23. Peak Inundated Areas 2021

(Source: Figure 17 - 23
ITT own compilation
2023 based on Global
Administrative Areas 2012,
Copernicus Sentinel-1
Data [DATE], CNES/Airbus,
Maxar Technologies 2023)



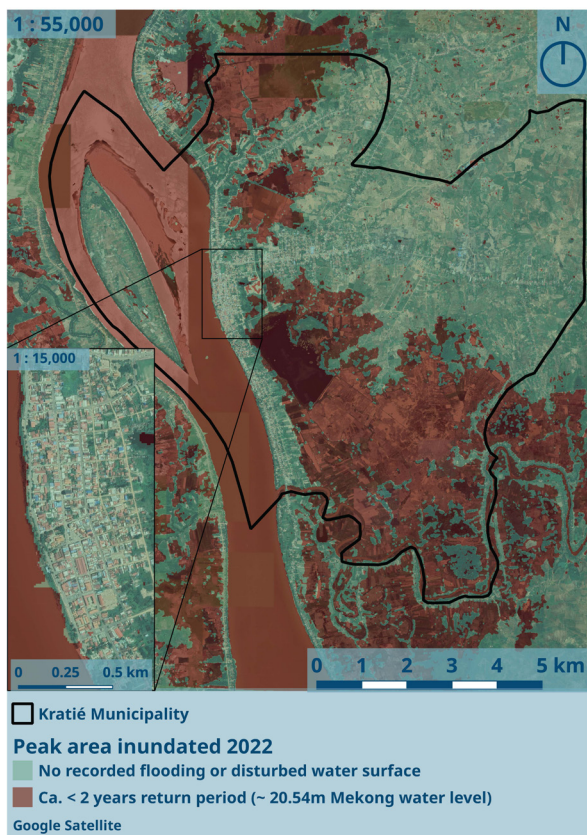


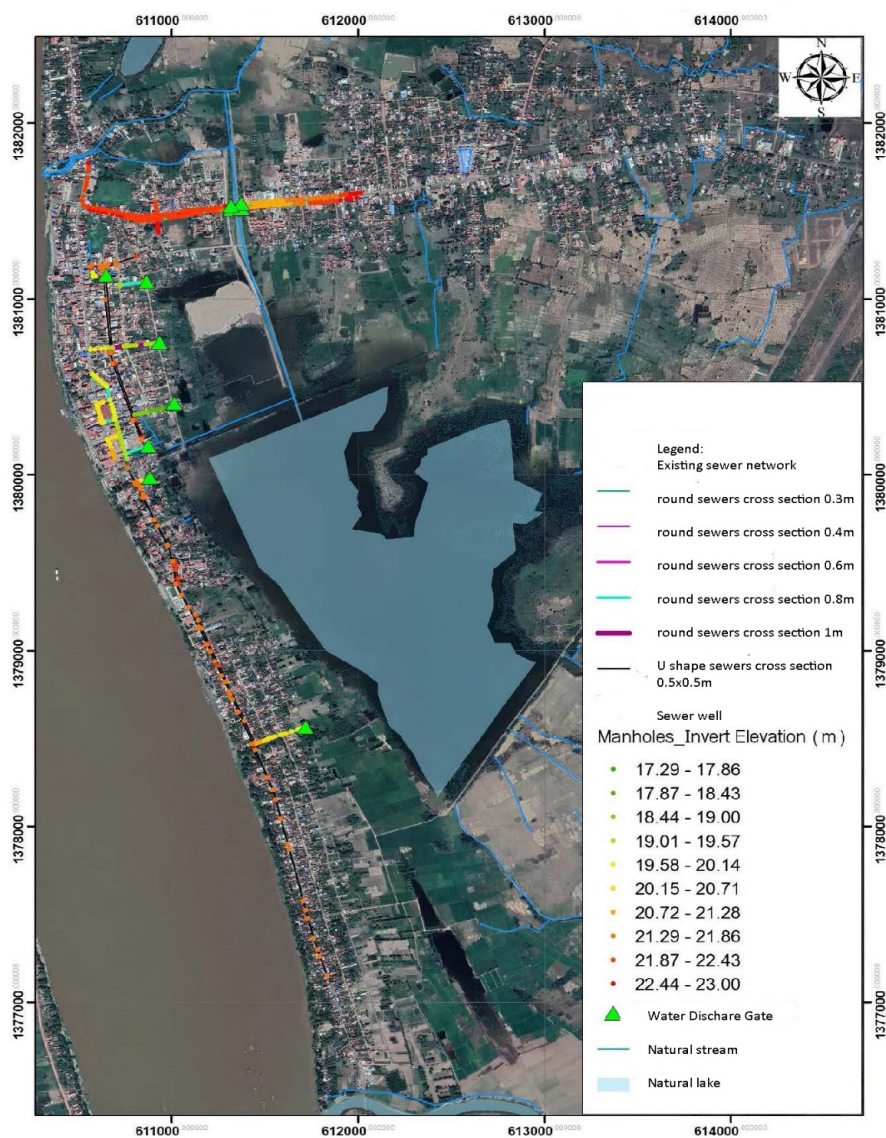
Figure 24. Peak Inundated Areas 2022

Figure 25. Peak Areas Inundated 2015 – 2022
(Source: Figure 24 - 25, ITT own compilation 2023 based on Global Administrative Areas 2012, Copernicus Sentinel-1 Data [DATE], CNES/Airbus, Maxar Technologies 2023)

Annex V.

Sewer and Manhole Elevation

Sewer Network and Manhole Elevations in Krong Kratié



គម្រោងសិក្សាកែលម្អបណ្តាញលូទឹកភ្លៀង និងប្រព័ន្ធចម្រោះទឹកកខ្វក់ក្នុងក្រុងក្រចេះ

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Figure 26. Sewer and manhole elevations
(Source: RGC, 2022)

Annex VI.

Reasons Why Owners do not Connect to Sewer Network

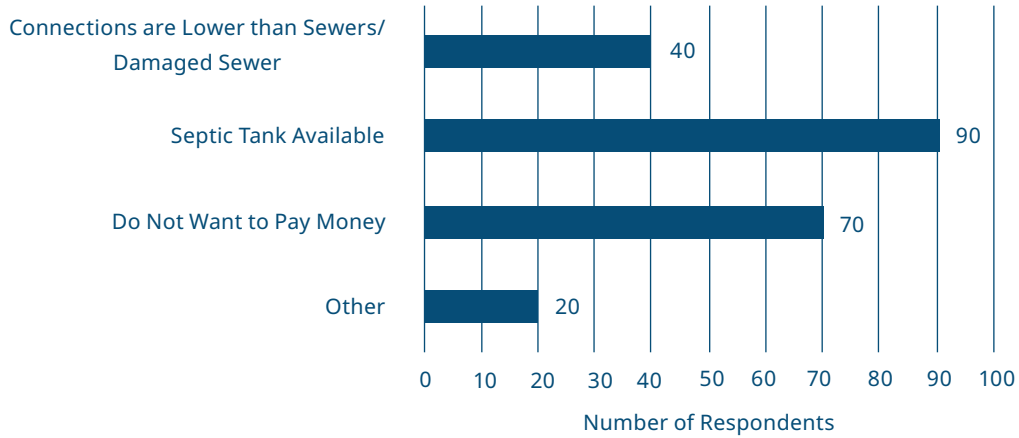


Figure 27. Reasons Why Owners Not Connect to Sewer Network (Source: RGC, 2022).

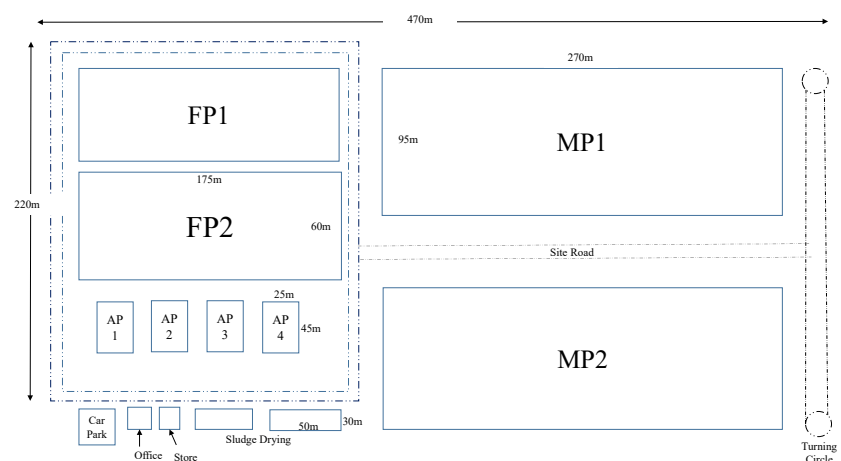
Annex VII.

Wastewater Treatment Plant Area for Krong Kratié & Conceptual Layout of the Proposed Krong Kratié Wastewater Treatment Plant



Figure 28. Wastewater Treatment Plant Area for Krong Kratié
(Source: RGC, 2022)

Figure 29. Conceptual Layout of the Proposed Krong Kratié Wastewater Treatment Plan
(Source: ADB, 2018a)¹



¹ Anaerobic Pond (AP), Facultative Pond (FP), and Maturation Pond (MP)

Annex VIII.

Solid Waste Management Landfill Layout

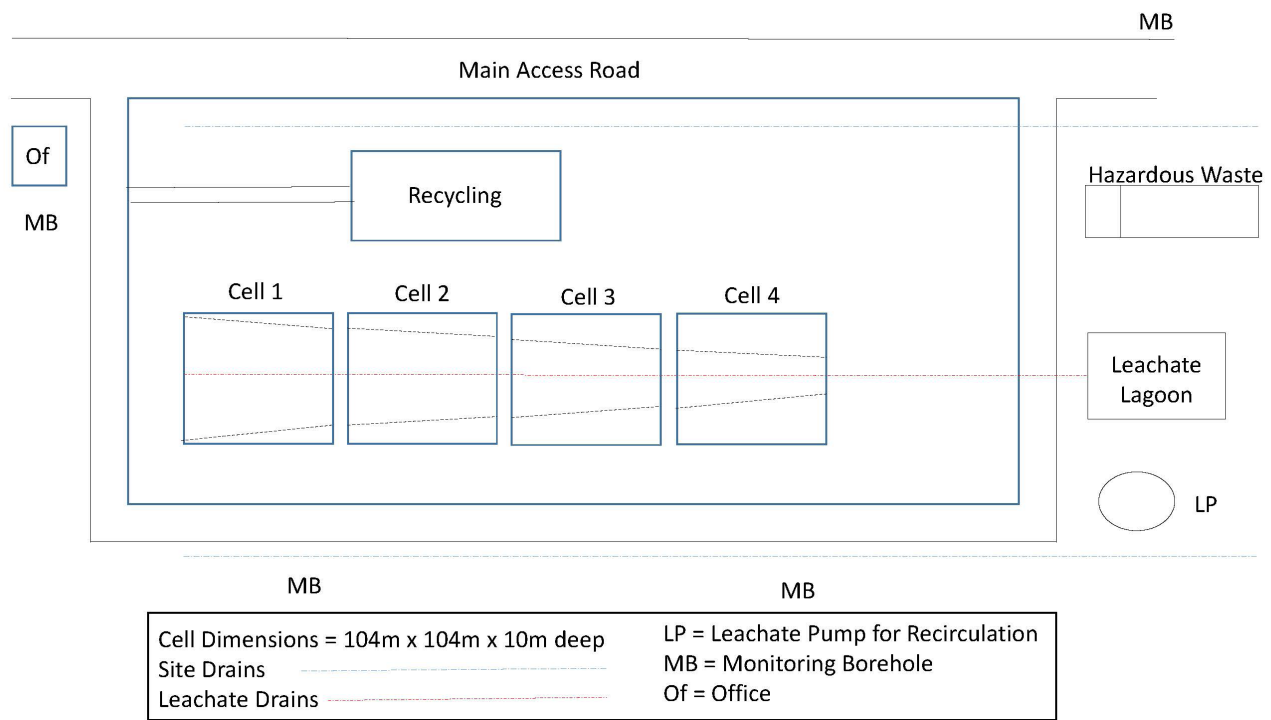


Figure 30. Solid Waste Management Landfill Layout (Source: ADB, 2018a)

Annex IX.

Subnational Government Mandates

This section reviews the critical mandates and frameworks for service provision in Krong Kratié. It outlines the responsibilities and directives for Commune/Sangkat Councils to capital, provincial, municipal, district and Khan councils. It focuses on formulating comprehensive development plans, integrating needs assessment, land and disaster management and preparedness, financial planning and performance indicators, all in order to ensure and empower transparent and democratic growth aligned with the national objectives. Finally, significant emphasis is placed on the Board of Governors, highlighting their pivotal role in steering the democratic process through consultation, integration, and reporting mechanisms.

Commune / Sangkat Councils

Commune/Sangkat councils are mandated to prepare, adopt and implement commune/sangkat development plans (Art. 60) within the first year of their term (Art. 62). These plans must align with the national social and economic development plans (Art. 61)¹.

Commune/Sangkat councils are responsible to follow-up, monitor and evaluate the implementation of plans, programs, projects and the delivery of services. This must be carried out transparently and with a strong sense of accountability (Art. 66).

At various administrative levels, including capital, provincial, municipal, district and khan councils, appropriate councils are required to formulate and approve a five-year development plan. The plan should undergo annual updates through a three year rolling investment program (Art. 37).

Councils must create a development plan that includes (Art. 39):

- Vision outlining goals and objectives for development within their jurisdiction.
- Evaluation of current development status and priority, including:

¹ See Chapter of the C/S Law relates to the Commune Development Plans

- Preparing to receive new functions, duties and resources.
 - Basic and necessary services, facilities, materials and public infrastructure.
 - Reduction of poverty.
 - Addressing needs of various groups, e.g. women, youth, vulnerable groups.
- A development framework for land use and natural resources' management.
 - A disaster management plan.
 - A financial plan, covering:
 - A capital development plan.
 - 12-month budget plan, from plan formulation.
 - 3-year budget plan, annually updated.
 - Transparent and accountable implementation strategy for citizens.
 - Key performance indicators and targets tied to development objectives and priorities within the development plan.

A Council manages public finances for democratic development, prioritizing vital needs:

- Anticipating the requirements of sub-national administrations as they prepare to assume new functions, duties and resources.
- Vital services, facilities, materials and public infrastructures.
- Poverty reduction.
- Addressing the needs of various groups e.g. women, youth and vulnerable groups, such as poor people and indigenous minorities (Art. 42).

The capital, provincial, municipal and district councils and administrations have their own budgets, known as sub-national administration budgets. Sangkats in a municipality share the municipality's budget (Art. 44)

The (municipal) council and the relevant commune/sangkat councils integrate strategies, programs and activities into the rolling investment and development plans for districts, communes and sangkats, including the annual and medium term budgets (Art. 100).

Jurisdiction of Municipalities and Sangkats²

The municipal council leads democratic development within its area. A sangkat council is under the supervision and management of the municipal councils. The municipal council delegates functions and duties to sangkat councils to establish, promote and sustain democratic development. Roles, duties and working relationships of the provincial, municipal and sangkat councils are defined by a sub-decree (Arts. 110-113).

All P/DMK Councils form a minimum of three committees (Art. 114) namely:

- Technical Facilitation Committee.
- Women and Children Affairs Committee.
- Procurement Committee.

Women's representation on each committee is mandatory (Art. 118).

Board of Governors

The Board of Governors (BoG), assigned by the Government and led by the Governor, is responsible to draft and present for council review and approval:

- A 3-year rolling investment program and budget plan.
- A 5-year development plan and medium-term expenditure plan that will be updated annually.
- An annual report on the performance of the council as provided in Article 50 of this Law for dissemination to citizens within its jurisdiction (Art. 163).

² Section 9

The BoG proposes strategies and consultations, on vital matters, including development planning with:

- Citizens within council jurisdiction.
- Internal council function and duties within its jurisdiction.
- Relevant government institutions and units.
- Relevant partners.

The BoG or council directly conducts these consultations (Art. 164).

The BoG report recommendations to council meetings to enhance implementation of:

- Obligatory and permissive functions.
- Councils' 3-year rolling investment programs and 5-year development plans. Plans managed by joint councils, different council categories, ministries, institutions, departments or units of the Royal Government and other relevant partners.
- Annual budget plan and sub-national administrations financial status.
- Council Bylaws (Art. 165).

The BoG consults the technical facilitation committee to integrate Royal Government services, equipment, and infrastructure within council jurisdiction into the 5-year plan, 3-year investment program, and sub-national budgets (Art. 166).

Regulatory Framework

National Programme (NP) on Sub-National Democratic Development Phase 2 (2021-2030)

D&D reforms are now guided by the National Programme on Sub-National Democratic Development Phase 2 (2021-2030) (NPSNDD 2) adopted by RGC in December 2021.

The National Programme Phase 2 (NP-2) is implemented in two 5-year phases, known as IP5-I (2021-2025) and IP5-II (2026-2030).

NP-2 will prepare guidelines for Sub-National Administrations (SNA) to prepare strategic planning documents on technical issues, in line with their mandates and functions. These may include:

- Spatial development plans (primarily for urban areas);
- Climate change resilience strategies and strategies to reduce the risk of serious infectious diseases;
- Sector strategy documents for service sectors for which the SNAs are responsible.

Included in the identified challenges, the NP2 recognizes that:

- Although SNA structures and systems have been continuously reviewed and improved, these systems are not always appropriate for every SNA level. Different types of SNAs are required to respond to different administrative needs in metropolitan, urban, and rural areas. Geography, demography and the socio-economic potential of each SNA needs to be taken into account as well.
- The management and implementation of public services supported by fees has encountered challenges. For example, the task of managing urban solid waste that was transferred to the capital, municipal, and district administrations has not yet been properly implemented. This function requires stronger support mechanisms, capacity development services, and a clear outline of the responsibilities of SNAs.
- Although financial resources have increasingly been transferred to SNAs, the amount has been insufficient for SNAs to fully perform their transferred functions and fulfil their responsibility of responding to the needs of the people.

Component two recognizes that urban SNAs will have different characteristics to rural SNAs. Information technology systems will be integrated to promote effective management and improve SNAs' internal and external communications.

One of this component's outcomes will be that:

"The municipal, district, commune, and sangkat administrations will be reorganized as local administrations with autonomy, capacity and responsibilities to provide public services directly to the people in their jurisdiction. The local administrations will be established with separation of structures, functions and management systems in accordance with potential and different local situations between urban areas and rural areas. With the local administrations responsible for:

1. Responding to the needs and wishes of the citizens; constantly consulting with citizens and involving them in planning procedures; customizing solutions to the respective local situation; strengthening the implementation of social accountability.
2. Developing and providing quality services and local development in accordance with the reform's policies, laws and standards.
3. Arranging effective accountability mechanisms for public administrations through SNA councils; arranging grievance mechanisms for citizens.

In addition (the component aims to) clearly define the authority, functions, roles and responsibilities of the administrations at each level. This strategy also requires the consideration of a number of priority tasks, including:

- Reviewing and improving the working relationship between SNAs, as well as the relationship between SNAs and ministries and institutions at the national level.
- Defining the obligatory and permissive functions of SNAs.
- Promoting the roles and responsibilities of the SNA councils.
- Continuing to enhance the three lines of accountability, namely the accountability of SNAs to higher SNAs and national-level administrations; accountability between SNAs of the same level; and accountability of SNAs to the people.

- Improving the inspection mechanism on the performance of SNAs.

Law on Commune/Sangkat Administrative Management (2001)

The purpose of the law is to establish administrative management of all communes/ sangkats in the Kingdom of Cambodia following a policy of decentralization” (Art. 1).

Whereby a commune/sangkat “governs local affairs of its territory in accordance with the Constitution, laws, Royal decrees, sub-decrees, proclamations (Prakas) and legal instruments concerned. Legislative power and Executive Power shall be vested in Communes/Sangkats and these Powers shall be implemented in consistence with the Constitution, laws, Royal Decrees, sub-decrees, proclamations and legal instruments concerned” (Art. 5).

The commune/sangkat shall be governed by directly elected commune councils for a five-year mandate (Arts. 9, 10, 11).

Commune/Sangkat development plans shall take measures:

- To evaluate the existing level of development and development activities within the commune/sangkat.
- To assemble all needs in the commune/sangkat and prioritize those needs based on available resources of the commune/sangkat and resources already received.
- To prepare programs that respond to the needs through providing services and development and these programs must be included in the annual budget of the commune/sangkat.
- To deliver services and development in accordance with its budget.
- To monitor, follow up and evaluate the result of implementation of the development plan.

- To report the results of implementation of the commune/sangkat development plans to citizens in its commune/sangkat. Commune/Sangkat council shall perform its activities consistent with its commune/sangkat development plans (Art. 63).

“Commune/Sangkat development plans shall be prepared in writing and shall have maps, statistics and other relevant documents attached to them. Commune/Sangkat development plans must also establish ways and means to enable the participation of the citizens of its commune/sangkat in the whole process” (Art. 64).

Law on Administrative Management of the Capital, Provinces, Municipalities, Districts and Khans (2008)

The purpose of this law is to define the administrative management of the Capital, Provinces, Municipalities, Districts and Khans (Art. 1). In accordance with the principles of a unified administration in order to establish, promote and sustain democratic development through the policy of decentralization and deconcentration (Art. 2).

Article five outlines how the capital, provinces and municipalities are administratively subdivided. The concept ‘of unified administration aims to strengthening the unity of the state in order to facilitate all public administrative activities within its territory’.

Each legal level (capital/province, districts/ municipalities / khans) shall have a council as a representative body which shall be indirectly elected (Art. 10), to establish, promote and sustain democratic development (Art. 11).

Where democratic development includes:

- Public representation;
- Local autonomy;
- Consultation and participation;
- Responsiveness and accountability;
- Promotion of quality of life of the local residents;
- Promotion of equity;
- Transparency and integrity;

- Measures to fight corruption and abuse of power (Art. 12).

With the actual formalities and procedures for the formulation, management and implementation of a development plan of the sub-national administrations shall be defined by a sub-decree.

Once approved, (municipal) plans shall be posted in public with the plan available for consideration by the public at the council office or for purchase (Art. 41).

Subsequent chapter(s) and articles outline:

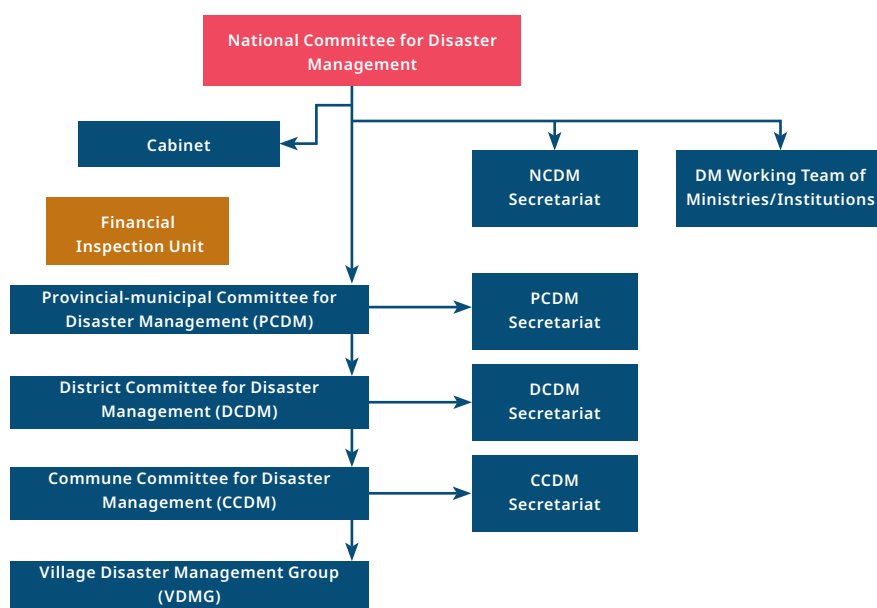
- Statutory Units of Subnational Councils (Chapter 4; Arts. 173-191).
- Implementation (operational) process(es) for democratic development; (Chapter 5):
 - for the National Committee for Democratic Development (NCDD) (Arts. 192-240).
 - for Financial Regime of the Capital, Province, Municipality, District and Khan (Arts. 241-253).
 - Management of Assets of Sub-national Administrations (Arts. 254-261).
 - Personnel (Arts. 262-273).
- Punishments (Chapter 6) (Arts. 274-276).
- Transitional and Final provisions (Chapter 7 and 8) (Arts. 277-286).

Annex X.

Current Governance Structures for Disaster Management

Government disaster management structures hold a pivotal position in addressing and reducing disaster-related vulnerabilities. The National Committee for Disaster Management (NCDM), a national coordination structure and institutional secretariat, has seen its mandate reinforced through the enactment of the 2015 Disaster Management (DM) Law.

This legislation reaffirms subnational structures at the provincial, municipal/district, and commune level. These are tasked with handling and responding to emergencies within their jurisdictions. The specific roles and responsibilities have been clarified in the recent legislation.



- Outside of the NCDM (national level), the subnational committees, generally only become active and meet when needed. Usually in response to an emergency, rather than acting pro-actively.
- The reported secretariat at subnational levels are usually one individual with disaster committee duties assigned to other subnational representatives.

However, it is crucial to note that the NCDM primarily operates at the national level, and the subnational structures and roles act as extensions to the local authorities/administration. Their focus predominantly remains reactive responses, instead of engaging in and supporting preventive and preparedness measures. This reactive tendency mainly stems from the lack of allocated resources, training, and guidelines for such functions.

The DM Law provides a detailed disaster management framework outlining a wide range of duties, including prevention/mitigation, preparedness, emergency response,

Figure 31. Reported DM structure national to commune levels (Source: CFE-DM, 2020)

and recovery. Yet, the current institutional strategies for managing flood and drought disasters seem to lean more towards reactive measures rather than taking a preventive and proactive stance.

In Krong Kratié, there seems to be a noticeable gap in local government structures, primarily due to the absence of fundamental skills, information, and resources to plan preventative measures and readiness activities that could alleviate disaster and climate change impacts. For drought disaster management for instance, the lack of reservoirs, water storage, and irrigation resources significantly impacts consistent agricultural activities in the municipality and the province. As a result of this deficiency, many areas become parched, limiting or causing the cessation of agricultural operations completely.

Annex XI.

Mandate for Water Supply Service Provisions

Responsibility for water supply lies primarily with three ministries:

The **Ministry of Industry Science Technology and Innovation (MISTI)**, formerly under the Ministry of Industry and Handicrafts, for urban piped water supply. Two state-owned enterprises are functioning as autonomous urban water supply utilities (the Phnom Penh Water Supply Authority (PPWSA) and the Siem Reap Water Supply Authority (SRWSA) (SMETS, 2015). MISTI's mandate aims to "ensure that 100% of the urban population have access to clean water by 2025 and ensure the following conditions: Quality, Sustainability, and Fair Prices" (CIUS, 2018), the management of piped clean water supply businesses and issuing of licenses has been transferred to the municipal level.

The **Ministry of Public Works and Transport (MPWT)** is responsible for urban drainage, sewerage and operation of water treatment plants.

The **Ministry of Rural Development (MRD)** for rural water supply, primarily decentralized systems with MISTI responsible for rural piped systems (Smets, 2015).

In addition, two other ministries play important roles in managing water supply sources and new development areas:

The **Ministry of Water Resources and Meteorology** issues permits which are required for abstraction of water over a defined level. The establishment and management of water pumping stations has been transferred to the municipal level (CIUS, 2018).

The **Ministry of Land Management, Urban Planning and Construction** is responsible for checking the adequacy of water supply provisions in new development areas (Smets, 2015).

However, for the subnational, municipal level, there is limited guidance to effectively integrate and operationalise transferred roles and duties, nor have the financial resources been reallocated from national sector institutions to subnational levels (CIUS, 2018).

Sector Coordination

The Infrastructure and Regional Integration Technical Working Group is chaired by the Minister of MPWT, and in 2010 a formal sub-group for urban water supply was established chaired by MIH (now MISTI), with JICA as its Lead Development Partner Facilitator. However, the frequency of meetings of these groups is unclear.

The Department of Potable Water Supply at MISTI in lieu of a regulator has responsibility for urban water supply policy, strategic planning, regulation and sector oversight, including the licensing of private water operators. While tariffs for public utilities require approval from the Prime Minister, in the recent past, tariffs for private operators have mostly been determined through local negotiation with hands-off involvement of MISTI. An official Prakas on the Procedures for Water Tariffs and relevant Prakas related to other businesses has been issued (NSDP 2019-2023). Small-scale private operators also play a significant role in water supply provision, particularly in rural growth centers and emerging towns.

The Ministry of Rural Development (MRD) is the lead agency for rural sanitation and water supply (wells, ponds, household rainwater harvesting, etc.), via the Departments of Rural Health Care (DRHC) and Rural Water Supply (DRWS) respectively. MRD has offices at provincial and district levels.

Regulatory Framework

The establishment of a legal framework for urban water supply is part of the RGC's priority policies within the NSDP 2019 to 2023.

In 1996, a law was passed granting legal autonomy to the Phnom Penh Water Supply Authority (PPWSA) and this was extended to other municipalities, such as Siem Reap, but not Krong Kratié at the current time.

The water quality standards as well as the necessary enforcement mechanisms are especially critical for Cambodia, which has a large population exposed to arsenic in groundwater, as well as high risk of non-chemical contamination due to poor sanitation and shallow groundwater levels. The initial Drinking Water Quality Standards were issued in 2004, and more recently two new sets of controls have been issued (See Annex XII):

1. By MISTI 2015 'Standard for Urban and Commercial Piped Water Supplies' (standards based approach).
2. By MRD 'Guideline for Rural Water Supply' approved in 2022 for 'not for profit' community systems and water points.

The 2003 policy established that Water and Sanitation User Groups (WSUG) were to be responsible for the management of rural non-piped water supply schemes, and in 2004 guidelines were issued accordingly. However, these groups generally tend to exist only in areas with externally supported projects, as no systematic mechanisms are in place to provide continuous technical and financial support. Compounding this, institutional arrangements under 'deconcentration and decentralization' are not clear, accountability mechanisms and clear procedures are missing, and citizen engagement and voice is not yet mainstreamed in social accountability initiatives. In 2005, a Memorandum of Understanding between MRD and Ministry of Industry, Mines and Energy (MIME) (currently transitioned to MISTI) allocated responsibility for piped water supply schemes above 500 connections to MISTI (SMETS, 2015).

Two primary pieces of legislation deal with regulating the urban piped water supply system:

1. Sub-Decree No. 86 on Construction Permits adopted in 1997 now evolved by Sub-Decree No.42 2015
2. Sub-decree No. 182 on the Functions and Structures of Municipal Administrations in 2019 transferred a number of responsibilities to the subnational level:
 - Potable water supply shall be made available for all constructions subjected to the application of a construction permit; or
 - In the event that the potable water supply is not available, the applicants shall provide proof that they can supply drinking water in sufficient quantity to buildings and shall indicate the means intended to do so whether by connecting to an existing water supply system or the use of a well (with the applicant indicating the technical specification of the well and the quality of the water generated);
 - If a collective well is used, the permit application shall include the written consent of the village chief;

- Individual lots or a multiple housing division/development shall be served by a drinking water distribution network.

Annex XII.

Updated Water Quality Standards as of 2015 for National Urban and Rural Drinking Water Systems

No.	Parameter	2004 DWQS ¹		2015 NDWQS ²		2015 NRDWQG ³	
		Total	53	27	9	14	3
		Standard Value	Standard Value	Exception	Guideline Value	Exception	
1	Aluminum	0.2	0.2	Alum Used			
2	Arsenic	0.05	0.05	Groundwater	0.05	Groundwater	
3	Copper	1	2	Copper Pipes Used for Household Plumbing			
4	Fluoride	1.5	1.5	Groundwater	1.5	Groundwater	
5	Hardness	300	300	Groundwater	300		
6	Iron	0.3	0.3	Groundwater	0.3		
7	Manganese	0.1	0.1	Groundwater	0.1		
8	Residual Chlorine	0.2 - 0.5	0.1 - 1.0	Chlorine Used for Disinfectant	0.2 - 0.5	Chlorine Used as Residual Disinfectant	
9	Sodium	200	250	Coastal Areas			
10	Ammonia	1.5	1.5				
11	Barium	0.7	0.7				
12	Cadmium	0.003	0.003				
13	Chloride	250	250				
14	Chromium	0.05	0.05				
15	Color	5 TCU	5 TCU				
16	Lead	0.01	0.01				
17	Mercury	0.001	0.001				
18	Nitrate as	50	50		50		
19	Nitrite as N ⁰²⁻	3	3		3		
20	Odour	Acceptable	Acceptable		Acceptable		
21	pH	6.5 - 8.5 (no unit)	6.5 - 8.5 (no unit)		6.5 - 8.5 (no unit)		
22	Sulphate	250	300				
23	Taste	Acceptable	Acceptable		Acceptable		
24	Thermotolerant Coliforms or E. coli	0 per 100ml	0 CFU or MPN / 100ml		0 CFU or MPN / 100ml		

1 Drinking Water Quality Standard (DWQS)

2 National Drinking Water Quality Standard (NDWQS)

3 National Rural Drinking Water Quality Guidelines (NRDWQG)

25	Total Dissolved Solids (TDS) for conductivity	800 - 1600 uS/cm)	800 (1600 uS/cm)		800 (1600 uS/cm)	
26	Turbidity	5 NTU	5 NTU		10 NTU	

Table 6. Updated Water Quality Standards
(Source: MIME 2004, MISTI 2015, MRD 2015, cited in Dahee. 2016)

Annex XIII.

Mandate for Sanitation Service Provision in Cambodia

Sanitation

For Sanitation in Cambodia, three primary ministries are responsible:

1. The Ministry of Public Works and Transport (MPWT) is responsible for policy, planning, coordination and the implementation of investment projects related to urban sanitation. More specifically, MPWT is responsible for the provision, operation and maintenance of drainage and wastewater systems and activities (in urban areas). In 2011 a mandated department under MPWT was established to set technical standards and tariffs for urban sanitation. Provincial MPWT departments are responsible for planning, project implementation and O&M of drainage, sewer and treatment facilities (treatment facilities are only present in Siem Reap, Sihanoukville and Battambang at the time of writing). Fee collection arrangements differ from city to city. For example, PPWSA provides this service through their water bill. At the current time there is no set tariff for the management of sewage in Krong Kratié. Improving on-site sanitation and the safe collection, management, treatment and disposal of fecal sludge does not rank highly on the priority list of MPWT and/or cities themselves. Private sector involvement in fecal sludge management is limited and largely unregulated.
2. The Ministry of Water Resources and Meteorology (MoWRAM) is responsible for promoting and facilitating the construction or rehabilitation of wastewater treatment systems in urban areas and densely populated areas, with sewage piped to waste water treatment plants to reduce the contamination of water.
3. The Ministry of Rural Development (MRD) is responsible for rural water supply and sanitation, although the construction and maintenance of onsite sanitation facilities are generally the primary responsibility of the owner households. MRD extends its presence to provincial level and to a much lesser extent to district offices (SMETS 2015).

Regulatory Framework

Urban Sanitation

There are a number guiding pieces of legislation that regulate the management, disposal and treatment of fecal sludge and sewage:

- A. In general, Sub-decree No. 235 dated 25 December 2017 on the Management of Sewer Systems and the Management of Wastewater Treatment Systems has been promulgated to house owners, the collective housing, business property owners, tourism sites or recreation centers, housing estate owners, and satellite cities (RGC, 2017). They are required to clean primarily before discharging the wastewater through a septic tank or an on-site wastewater treatment plant. Permission must be sought via an official authorization letter from relevant institutions before the wastewater can be discharged and to organise payment for the use of the public sewerage system.

This eight chapter, 54 article sub-decree aims to improve the management of drainage and wastewater treatment systems across Cambodia in terms of efficiency, transparency, and accountability to ensure safety, public health, and biodiversity conservation (Art. 1). It clarifies the roles and responsibilities of the Ministry (and provincial departments) of Public Works and Environment with regard wastewater treatment.

The sub-decree's five goals are:

1. Revision and enhancement of the responsibilities of Ministries, Institutions, Specialist Units, sub-national administrations, and concerned stakeholders on the improvement of drainage and wastewater treatment systems;
2. Transfer of the functions on operation and maintenance of drainage and wastewater treatment systems to capital, municipal, district, and khan administrations;
3. Determination of the key measures to enhance the efficiency and safety in the management of drainage and wastewater treatment systems;
4. Enhancement of public understanding and encourage people's participation in the use of drainage and wastewater treatment system services;

5. Encouragement of the participation of development partners, private sector to develop or to invest in construction, operation and maintenance of drainage and wastewater treatment systems (Art. 2).

It requires Municipal Administrations (such as Krong Kratie) to fulfil their role in the management of drainage and wastewater treatment systems within their jurisdiction and duties, including:

- Preparation of an action plan to carry out the construction work, reparation, rehabilitation, and maintenance of drainage and wastewater treatment systems;
- Promotion of the legal framework law and concerned legal documents, including enforcement related to the management of drainage and wastewater treatment systems and penalties for violations;
- Connection of sewer pipes from houses to main services, later charging the set-up service fee;
- Preparation of and management of drainage and wastewater treatment system service fee;
- Approval of requests for drainage connection, requests for drainage and wastewater treatment system services;
- Implementation of the construction work, reparation, rehabilitation and maintenance of drainage and wastewater treatment systems;
- Implementation of the fee collection of drainage and wastewater treatment system services;
- Enhancement of public education for maintenance and the promotion of public participation to use drainage and wastewater treatment system services;
- Management of budget and procurement for the maintenance and the development of drainage and wastewater treatment systems;
- Delegation of elements of management of drainage and wastewater treatment systems to commune/sangkat administrations within its jurisdiction or motivate the participation of commune administrations to perform their roles effectively;

- Mobilization of funds, means and materials for development of drainage and wastewater treatment systems (Art 11).

Chapter three on Measures on Wastewater Management, Drainage, and Wastewater Treatment Systems (Arts. 14-25) details technical aspects for wastewater by requiring owners of residential and cluster residential buildings to take responsibility for managing their generated wastewater, such as:

- Install a septic tank in accordance with construction permits (based on the 1997 Sub-decree No. 86);
- Request for connecting sewer pipe to public drainage and pay for the service fee;
- Payment for wastewater treatment plant service fee in the event that wastewater in urban areas is conveyed to be treated in a wastewater treatment plant.

It also requires adherence to the Effluent Discharge Standards, as well as permission/ permit requirements for different types and scales of developments, which can be approved at different levels. With municipal levels allowed to approve developments less than 30,000 square meters or a building area less than 5,000 square meters.

Chapter four on Usage Services of Sewerage and Wastewater Treatment Systems (Arts. 26-30) delegates responsibility for managing and providing the sewage service system within their jurisdiction (to the relevant subnational level) including the imposition and collection of fees (to be guided by a ministerial sub-decree).

Chapter five (Arts. 31-35) presents the monitoring and inspection framework for wastewater connection systems and for wastewater treatment plants in developments (boreys; so called satellites cities' and for on-site wastewater treatment) and for reporting issues arising with these.

The final three chapters of the sub-decree covers the penalty system for breaches of the sub-decree (with fines up to 10,000,000 KHR (~US\$2,500) and the transitional and final provision (for the enactment) of the sub-decree.

Standards for the Construction of Septic Tanks and Sewer Connections

In the absence of a sewer system, building owners shall make provisions to treat and evacuate sewage water through a septic tank and a sub-terrain filtering system. In urban areas, building owners shall make provisions to connect their septic tank to the sewer system.

Septic tank specifications are defined as follows:

- The volume of the septic tank measured between the bottom and the interior level of the effluent outlet shall be: a minimum of 3m³ by living unit or 3m³ per floor of the "apartment" or the house, or 3m³ for 80m² of floor.
- For hotels: 2m³ plus 0.5m³ per bedroom.
- The height of the septic tank >1.5m.
- The septic tank will be ventilated.
- Under no circumstances may rain water be allowed to penetrate the septic tank.

A blue print of the septic tank for hygiene installation and the connection to the sewer system is included in the construction permit application. Construction permits will be denied if it does not present sufficient assurance for hygiene and health at the projected construction and for surrounding existing constructions. However, there is no sub-decree or official guidance on how often fecal sludge should be removed from septic tanks, how this removal should be conducted, or how sludge should be transported, stored, and reused.

- B. Sub-decree No. 39, from March 2011, requires housing estate owners to install a drainage system and wastewater treatment plant appropriate for the size of their housing estate.
- C. Sub-decree No. 113, on 27 August 2015 on the Management of Garbage and Urban Solid Waste in Chapter 4, Article 27 details how businesses pumping, transporting, and disposal of sludge from 'septic tanks' must gain authorization from the Krong/ Municipal administration based upon the technical guidance of the Provincial/Municipality Department of Environment.

- D. Sub-decree No. 103, on 29 June 2021 details revisions to Article 4, Article 9, Article 11, Article 12, and Article 17, and Appendix 2, Appendix 3, Appendix 4, and Appendix 5 on the regulation of water pollution by providing a new effluent standard, particularly for businesses and forms of industry that generate amounts of wastewater. This explains that a wastewater treatment plant must be installed and used and authorization given before treated sludge can be disposed to open water bodies, closed water bodies or a centralized wastewater treatment plant.
- E. Sub-decree No. 86, on 23 December 1997 (now evolved by Sub-decree No. 42 2015) specifies that, in the absence of a wastewater sewerage system, the owners of the construction or property are responsible for treating and discharging wastewater to the environment via a septic tank and underground sewage system. Letters authorizing the construction must also include the septic tank design and the connection system to the sewers. The construction authorization can be denied if sanitation cannot be ensured with negative implications for the site and the surrounding area. Essentially, the property owners have a duty to build a suitable septic tank and connect it to the available sewer network.

Annex XIV.

Rural Water Supply and Sanitation

Activity and investment in the rural subsector is guided by the National Strategic Plan for Rural Water Supply, Sanitation and Hygiene 2014-2025, which was approved by the Council of Ministers in 2014 (Smets 2015).

Sector Coordination

Two working groups exist to support coordination of the activities of government and external agencies in the sanitation sector.

The urban sanitation subsector coordination is limited due to unclear mandates and infrequent meetings. The Infrastructure and Regional Integration Technical Working Group is chaired by the Minister of MPWT and was established in 2006 (Smets 2015).

In contrast, the Technical Working Group for Rural Water Supply, Sanitation and Hygiene was established formally in 2007 and includes a supporting secretariat. Meetings are expected to take place quarterly and are chaired by the Minister of the Ministry of Rural Development with a development partner acting as co-chair on a rotating basis (for example, UNICEF¹ was co-chair from 2011). For over 20 years, there has been a monthly coordination meeting for knowledge sharing, which is chaired by the Director of the Department of Rural Water Supply. Subgroups exist to focus on particular priority areas (Smets 2015).

¹ United Nations Children's Fund (UNICEF)

Annex XV.

Mandates for Solid Waste Management Service Provision

There are 14 national-level institutions with various mandates related to Solid Waste Management.

The primary institutions are:

The **Urban Solid Waste Management Committee** is responsible for monitoring, evaluating and coordinating the implementation of the Urban Solid Waste Management Policy 2020-2030 (RGC, 2020).

Ministry of Environment

- Leads and coordinates relevant ministries-institutions and sub-national administration to implement the Urban Solid Waste Management Policy 2020-2030;
- Provides technical support to local administrations to implement urban waste management functions widely and effectively;
- Cooperates among ministries, sub-national administrations and institutions and development partners to seek technical and financial support to improve the urban solid waste management cycle, including the final disposal of urban solid waste in landfills;
- Reviews, evaluates and decides on the site preparation techniques, environmental protection measures during the operation and closure of the landfills and the use period of urban solid waste landfills;
- Cooperates with relevant ministries-institutions to monitor and evaluate management practices for urban solid waste.

The **Ministry of Interior and the National Committee for Democratic Development at the Sub-National Level (NCDD)** has the role of promoting urban solid waste management operations and supporting and cooperating with the Ministry of Environment and other stakeholders in capacity building and sharing of management experiences of urban solid waste to the sub-national administration.

It coordinates and mobilizes support for the sub-national administration to improve the efficiency of urban solid waste management, as well as providing interventions to monitor, control and evaluate the implementation of urban solid waste management.

Ministry of Economy and Finance distributes the Royal Government's intervention budget for subsidies to fill the gap for operating urban solid waste cleaning, collection, transportation and storage services; construction of urban solid waste transfer stations; treatment facilities and a hygienic and environmentally safe urban solid waste storage area. For the Capital, City and District Administrations, it mobilizes funding from development partners, the private sector and other sources for implementing projects related to urban solid waste management. It also prepares and resolves issues related to the financial mechanisms that support the implementation of the Policy, increases the budget for environmental sanitation services supporting the implementation of urban solid waste management functions of sub-national administrations, and mobilizes funding from development partners and the private sector to implement projects related to urban solid waste management.

Other national level institutions with responsibilities related to the management of solid waste include:

- Ministry of Tourism and the National Committee for Clean City Assessment (NCCCA)
- Ministry of Industry, Science, Technology and Innovation
- Ministry of Mines and Energy
- Council for the Development of Cambodia
- Ministry of Land Management, Urban Planning and Construction
- Ministry of Public Works and Transport
- Ministry of Water Resources and Meteorology
- Ministry of Information
- Ministry of Education, Youth and Sports
- Electricite du Cambodge

At the Sub-National level, administrations are expected to:

- Implement the 3R principles of reduction, reuse and recycling of urban solid waste based on the technical guidelines from the Ministry of Environment. To achieve this, sub-national administrations must establish urban solid waste sorting at the generation source through equipping separate urban solid waste bins at home and in public for the sorting of different types of waste, etc.;
- Organize and establish a centre for urban solid waste recycling and composting, etc.
- Focus and organize training programs, education and dissemination of knowledge to the public about hygienic and environmentally safe urban solid waste management.

Capital and Provincial Administrations are responsible for developing strategic plans and activities for urban solid waste management into regions by incorporating a planning strategy for urban solid waste landfills. The Capital-Provincial Administrations promote and facilitate the construction of urban solid waste landfills in the form of inter-capital, cities and districts (common landfills).

Municipal and Sangkat Administrations are responsible for directly implementing urban solid waste management and programs to ensure sustainable development at their local level. Sub-national administrations develop instructions or action plans for the implementation of urban solid waste management at the local level by strengthening the efficiency of urban solid waste companies in cleaning, collection and transportation of solid waste, the preparation of temporary transfer stations, and transportation and treatment, including instructions on urban solid waste sorting at the waste generation source. Sub-national administrations shall establish mechanisms to monitor, investigate and strengthen the imposition of strict penalties for violations of laws and regulations related to urban waste management (RGC,2020).

Regulatory Framework

The Urban Solid Waste Management Policy 2020-2030 aims to develop and implement a modern and comprehensive urban solid waste management system, taking into account economic efficiency, financial resources, environmental sustainability, and social aspects.

Sub-Decree No.113 on the Management of Urban Garbage and Solid Waste (2015) aims to decentralize waste management and establish roles and responsibilities at the subnational level. It outlines requirements for waste separation, storage, cleaning, collection, transportation, recycling, and management of landfills. It prohibits waste dumping and burning and requires fee payment for sustainable waste management. It defines penalties for non-compliance with the law. One of the key objectives of the sub-decree is to decentralize waste management to give subnational authorities greater responsibility (GGGI, 2020).

Sub-Decree No.36 on Solid Waste Management (1999) strictly prohibits the import of hazardous waste. The export of hazardous waste is not prohibited but shall comply with the Basel Convention.

Sub-Decree No.16 on E-waste Management (2016) strictly prohibits the import of E-waste. The export of E-waste is not prohibited but shall be in compliance with the Basel Convention. Some Used Electrical and Electronic Equipment (UEEE)¹ are classified as hazardous goods. The importation of such goods is required to have permission.

Amendment to Sub-Decree No.209 on the Enforcement of the List of Prohibited and Restricted Goods (2019) (from prohibited goods to restricted goods) - yet to come into force. The importation of parings and scrap plastic (made from polymer or ethylene, non-rigid cellular products) and UEEE (10 items) are not prohibited, but permission must be given and adherence to the Basel Convention is required.

¹ Used Electrical and Electronic Equipment (UEEE)

Annex XVI.

Urban Planning and Governance

The content of the following section is essentially based on CIUS (2023).

Key Messages

- 1. Regulatory Framework for Urban Development:** Cambodia's government has developed a variety of policies and regulations to guide urban development, including land use, infrastructure development, and environmental protection. Nevertheless, Cambodia's spatial planning approach "is still in its infancy" and is progressively being integrated into a comprehensive legislative and policy framework (MLMUPC, 2016).
- 2. Implementation Challenges in Urban Planning:** A key challenge in Cambodia's urban planning and development is the effective implementation of sub-national planning mandates that are hindered by limited resources and capacities, leading to oversights in local social and economic planning.
- 3. Overlapping Roles:** Overlapping roles and responsibilities related to the water and urban nexus lead to fragmented development processes due to limited coordination and consideration between ministries, exacerbating the difficulties in implementing effective urban planning and development.
- 4. Green Urban Development Approach:** Cambodia has adopted the Green Urban Development Approach, which includes development principles for integrated urban planning, green infrastructure, renewable energy, and social inclusion, and this is being implemented in Phnom Penh although constraints in resources make rolling this out in other cities a challenge.
- 5. Multi-Sectoral Cooperation in Urban Planning:** Effective urban planning in Cambodia requires multi-sectoral cooperation at national and sub-national levels, involving various councils, committees, and entities, with notable successes in disaster management.
- 6. Citizen Participation and Public Engagement:** While citizen participation is integrated into all aspects of subnational planning in Cambodia with the Organic

Law emphasizing public consultation, inclusivity and transparency, the effectiveness of public engagement is unclear.

Overview

Spatial planning was introduced in 1994. However, land administration and dispute resolution took precedence until more recently, especially in urban areas. With 29 ministries and state secretariats, urban and water development processes are fragmented due to overlapping roles and responsibilities (**See Annex XVII. Ministries and Responsibilities in Water and Urban Nexus at the National Level**).

Info Box 1: Overview of Roles in Urban Planning and Development

1. Ministry of Land Management Urban Planning and Construction (MLMUPC):
 - Oversees spatial/land use planning, land management, and construction for urban and rural development.
2. National Committee for Sub-national Democratic Development (NCDD):
 - Inter-ministerial mechanism for promoting "democratic development" through decentralization and deconcentration reforms.
 - Coordinated and guided by the Ministry of Interior (MoI).
 - Secretariat of NCDD is located at MoI.
3. General Department of Administration (GDA) at MoI:
 - Coordinates and supports subnational (public) administrations at national and sub-national levels.
 - Covers capitals, provinces, districts, municipalities, khans, and communes.
 - Advisory roles played by the Ministry of Planning (MoP) and Ministry of Economy and Finance (MoEF).
4. Support from Other Ministries and Institutions:
 - Ministry of Planning (MoP) supports subnational planning processes.
 - Ministry of Economy and Finance (MoEF) supports subnational budgeting,

Mandates

Spatial Planning Governance – National Level

Current Urban Planning Legislative Context

The 1994 Law on Land Management, Urban Planning and Construction (an update is pending), guides urban planning in Cambodia. It promotes the organization of urban and rural areas based on their geographical conditions and characteristics, protecting nature and culture while ensuring economic development. It establishes an inter-ministerial National Committee for Land Management, Urban Planning and Construction (MLMUPC) and sub-committees at provincial and municipal levels. These committees are tasked with drafting development master plans approved by the National Committee and enacted through a government sub-decree.

Other relevant policies and regulations that contribute to spatial planning governance provide guidance on various aspects of urban development, such as land use, infrastructure development, and environmental protection. **(See Annex XIX. Other Legislative Instruments Related to Urban Planning and Land)**

Info Box 2: De-concentration and decentralization reform process: Spatial Planning Functions Recently Delegated to Municipalities, including Krong Kratié

In 2019, Cambodia's deconcentration and decentralization reform process led to the adoption of RGC Sub-Decree No. 182 ANK.BK, which reformed the functions and structure of municipalities. This transferred 169 functions across 58 areas of responsibilities from 20 different sector ministries to the District Municipalities and Khans (DMKs), including Kratié. The aim was to enhance efficiency, administration management, public service delivery, and local development at the municipal level.

Under the mandate of the Land Management, Urban Planning, and Construction sector, various functions were transferred to municipalities, including land management and urban planning tasks. Municipalities are now responsible for developing and implementing land use master plans, urban land use planning, and detailed urbanization planning. They also handle land (cadastre) matters, construction sector tasks, and review local land concession plans. In Krong Kratié, five officers provide technical support across various roles and functions, mainly

Key Role of the Ministry of Land Management, Urban Planning and Construction (MLMUPC)

The Ministry of Land Management, Urban Planning and Construction (MLMUPC) in Cambodia is responsible for spatial planning and land management. Established in 1998, it was tasked with ambitious roles in land management, urbanization, and construction. However, the implementation of these roles has been challenging due to the concentration of professional expertise in the capital.

Recently, the Royal Government and MLMUPC have updated land management and urban planning policies, leading to the creation of new planning committees via Sub-Decree No. 77.

Sub-National Spatial Planning Roles and Governance

At the sub-national level, spatial planning roles and governance are delegated to **municipalities and sangkats**. This decentralised approach intends more **localized decision-making** and that urban planning aligns with the specific needs of each area.

Municipal Spatial Planning Framework

Municipalities are responsible for developing and implementing their spatial planning frameworks, providing a roadmap for urban development within the municipality, including land use zoning, infrastructure development, and environmental conservation. Additionally, in 2016, the MLMUPC developed three volumes of Spatial Planning manuals with support from GIZ. These manuals provide guidance but do not have legal binding.

The municipal planning system involves two tools:

- 1. The Municipal Land Use Master Plan (MLUMP)** is aligned with the Provincial Spatial Plan (PSP), providing crucial details for spatial development. The MLUMP defines land use types and allocation, integrating greenery, water systems, transport, and infrastructure development and requires detailed sector plans, which are currently absent from available drafts of the pending master plan for Krong Kratié.

2. The Municipal Land Use Plan (MLUP) provides the regulatory framework for construction and use of urban and sub-urban land. The district LUMP follows a similar approach, with a focus on rural areas and rural-urban linkages, emphasizing sustainable watershed management and resource management. The MLUMP process involves nine steps and 28 tasks, taking approximately 26 months. The MLUP process, which overlaps with the MLUMP, takes 22 months. It is initiated by the District/Municipal Land Management and Urban Planning Committee and final approval given by the National Committee for Spatial and Urban Planning.

Sangkat Land Use Plans

Municipal sangkats develop land use plans that consider population growth, infrastructure requirements, and environmental sustainability to ensure effective urban planning at the grassroots level. The SLUP, revised by a Municipal Working Group and approved by the Provincial State Land Management Committee, identifies spatial dimensions for development initiatives via a 11-step process aligned with the sangkat development and investment planning and updated annually.

Info Box 3: Sangkat Kratié Development Planning and the Three-Year Rolling Investment Program

The three-Year Rolling Investment Program for Sangkat Kratié (2022-2024) outlines several key development projects: construction of box drains in Kratié Village, construction of round drains on both sides of the road in Trapeang Pring Village, and repairing gravel roads and constructing drains in Daun Chram Village. However, while these are priority action plans, no budget may be allocated.

Multi-Sectoral Cooperation

At the **national level**, the Council of Ministers and the Council for the Development of Cambodia oversee coordination, with Sectoral Technical Working Groups supporting technical dialogue. The National Committee for Sub-national Democratic Development leads programs, mobilizes assistance, and coordinates the transfer of functions and resources. **Sub-National** Administrative entities consult with neighboring entities during planning, and investment coordination committees resolve disputes.

At the municipal level, councils coordinate with Sangkat councils and communities through statutory committees and Boards of Governors. In addition, Sangkat Councils create and execute Sangkat Development Plans (SDP) and Sangkat Investment Programmes (SIP). The SIP aligns with the SDP and the District Integration Workshop aligns the SIP with provincial plans coordinating resource mobilization and stakeholders.

Urban Planning Approaches

Spatial Planning

The Municipal LUMP aligns with the Provincial Spatial Plan and provides detailed directions for spatial development, and the Land Use Plan provides comprehensive and regulatory land use.

Krong Kratié Municipal Land Use Master Plan

An indicative land use map has been drafted, depicting the proposed allocation of land for various purposes within the municipality and consultation workshops conducted. However, as of September 2023, the MLMUPC's official approval is pending, and detailed sector plans are lacking.

Info Box 4: Challenges in carrying out land use planning tasks in Krong Kratié

The Provincial Department of Land Management, Urban Planning, Construction, and Cadastre in Kratié has a total of 47 staff members, but only around 20% of them are technical personnel. The department is challenged to address land management and cadastre activities, and construction oversight required across the entire province.

Sustainable ("Green Growth") Urban Development Approach

In recent years, Cambodia has adopted **Green Urban Development** as promoted by the National Council for Sustainable Development. It aims to create sustainable cities through the economy, environment, society, and culture and **integrated into the government's strategic plans**.

Green City Plans have been implemented in certain cities, including Phnom Penh, with a strategic focus on integrated urban planning, green infrastructure development, renewable energy, eco-tourism, social inclusion, and effective city governance. However, harmonizing the Green Urban Development approach with existing spatial and socio-economic planning frameworks and subnational governance structures is challenging due to overlap and replication. Due to limited resources, how the Sustainable Green Growth Urban Development (SGGUD) approach will be applied in Krong Kratié and how it aligns with existing government planning approaches is unclear.

Info Box 5: Sustainable (“Green Growth”) Urban Development Framework

The integrated urban planning and green infrastructure development component of the strategic objectives encompasses urban design, land-use planning, waste management, water supply, transport, energy supply, and climate change mitigation. The green local economy component promotes renewable energy, eco-tourism, natural assets and cultural heritage, and green businesses, while social inclusion aims for equitable access to public infrastructure, affordable housing, and education. City governance focuses on enhancing financial and institutional capacity for green projects, and facilitating information sharing and best practices dissemination.

Community Engagement

Community engagement in Cambodia's socio-economic development planning process is facilitated through annual village meetings by Sangkat Planning and Budgeting Committee (PBCs) and public Sangkat Council meetings.

In addition the Social Accountability Framework (ISAF) has been progressively expanded across Cambodia to inform citizens about the services they are entitled to receive and facilitate dialogues with sub-national authorities to identify and implement joint actions. The ISAF approach also includes the use of Information and Communication Technologies (ICT) to reach a larger number of citizens and the implementation of Joint Accountability Action Plans (JAAP).

Multi-Stakeholder Involvement and Public Participation

The Organic Law on Administrative Management of Capital, Provinces, Municipalities, Districts and Khans (2008) values diverse perspectives in decision-making and so subnational councils consult with citizens, other councils, government ministries, and stakeholders during plan formulation and implementation. Draft decisions are disclosed to the public and relevant councils for review and comment. Municipalities establish mechanisms to collect feedback. The sub-decree promotes transparency and public access to information throughout the planning and development processes. However, observational evidence suggests that certain segments of the population, particularly the youth, have become disillusioned or disinterested in the planning processes as their previous participation has yielded limited results.

Local Budget for Urban Development

Subnational administrative financing is distributed annually to three levels: the capital and provinces, districts/municipalities/Khans (DMKs), and Commune/Sangkats (C/S). This varies based upon population size, area, poverty, and economic need. The subnational administrative budget allocation for 2022-2023 ranged from \$634 million to \$1.04 billion, and Commune Development Budgets for 2019 ranged from \$35,000 to \$110,000. For Krong Kratié, for example, Sangkat O'Russey received an annual budget of approximately \$47,805 for development activities in 2022, with the remaining portion of the average budget allocation being used for Sangkat Council salaries and administrative costs. The smallest Sangkat, Koh Trong, received an indicative budget of approximately \$29,512 for development activities¹.

Key Recommendations

1. **Strengthen Technical Capacity:** Enhance the technical capacity of the Provincial Department of Land Management, Urban Planning, Construction, and Cadastre in cities like Krong Kratié. This could involve providing additional training or resources to staff or hiring more technical personnel to effectively manage land use planning tasks.

¹ Note: The provided budget figures are reported amounts and may not reflect the current or exact budget allocations.

2. **Promote Green Urban Development:** Continue to implement and refine the Green Urban Development approach. This could involve providing additional resources or support to harmonize this approach with existing planning frameworks and expand it to other cities.
3. **Integrate Water-Sensitive Strategies in Urban Planning:** Given Krong Kratié's wealth of blue and green infrastructure, including Boeung Romleach, and the urban water-related challenges affecting vital infrastructure, it's crucial to integrate water-sensitive strategies into the urban planning process. This includes developing comprehensive preservation and enhancement of the town's natural assets, such as Boeung Romleach and connected waterways, flood management plans, and improvements to wastewater and drainage systems. The Green Urban Development approach, already adopted by Cambodia, could serve as a guiding principle for these strategies.
4. **Ensure Sustainable Urban Expansion:** As Krong Kratié faces urban expansion, it's important to ensure this growth is sustainable and does not compromise the town's natural resources or exacerbate existing issues. This involves aligning the Municipal Land Use Master Plan (MLUMP) and the Municipal Land Use Plan (MLUP) with sustainable principles, conducting environmental impact assessments for new developments, and implementing strict regulations to protect green spaces. The expansion should also consider Green Growth strategies, and the principles of citizen participation, ensuring that the public is engaged in the planning processes and their concerns are addressed.

Annex XVII.

Ministries and Responsibilities in Water and Urban Nexus at the National Level

#	Ministry	Roles and responsibility	Direct (D)/ Indirect (ID) Responsibilities
1	Ministry of Agriculture, Forestry and Fisheries	With responsibilities for guiding and supporting the development of the agricultural fisheries and forestry sectors, as well as the formation of agricultural water user groups	D
2	Ministry of Commerce	Responsibilities including registering all business/ commercial enterprises in the country.	ID
3	Ministry of Economy & Finance	With responsibilities for government budgeting expenditure, tax and revenues collection, as well as coordinating state assets and resettlements.	D
4	Ministry of Environment	With responsibilities for guiding and managing environmental protection and conservation. Leads on controlling pollution.	D
5	Ministry of Health	With overall responsibilities for public health	ID
6	Ministry of Industry, Science, Technology and Innovation (formerly Ministry of Industry and Handicrafts)	Responsibilities include public and private urban water supply; with MISTI is responsible for licencing private sector water supplies. Leads on industrial development and authorisation of all small, medium and large scale enterprises engaged in production.	D
7	Ministry of Interior	MoI responsibilities include supporting and guiding sub-national administrations at provincial, municipal/ district and commune /sangkat levels.	ID
8	Ministry of Land Management, Urban Planning & Construction	Responsibilities including land administration (titling /registration), land management involving urban and rural land use planning and construction.	ID
9	Ministry of Planning	Responsibilities including socio-economic planning and monitoring, including CSDGs.	ID
10	Ministry of Public Works and Transport	Leading on the planning and development of national infrastructure, including road and bridges, as well as leading on urban drainage, wastewater, and dumpsites.	D
11	Ministry of Rural Development	Responsibilities include rural water supply and sanitation, as well as having health responsibilities, and small-scale infrastructure provision (roads, bridges, irrigation, etc.).	D
12	Ministry of Social Affairs, Veterans & Youth Rehabilitation	Responsible for coordination of the government responses to vulnerable groups, including the poor, and disabled, etc.	ID
13	Ministry of Water Resources & Meteorology	Responsible for leading and the overall coordination of hydrological resources, including Integrated Water Resources Management (IWRM) and meteorological issues.	D

Table 7. Ministries and Responsibilities in Water and Urban Nexus at the National Level
(Source: CIUS, 2020)

Annex XVIII.

MLMUPC and its Provincial Department's Operational Roles & Responsibilities

General Departments & (Provincial) Offices	General Roles and Responsibilities
General Department of Land Management & Urbanization	<p>Is responsible for:</p> <ul style="list-style-type: none"> • Making proposals and implementing strategic policies for land management and urban planning to ensure the balanced and sustainable economic and social development so as to protect the common interest, environment, natural resources, cultural heritage, and patrimony, and to enforce public order and to safeguard beauty; • Collecting information and data, by cooperating with the relevant ministries and institutions, for studies and analyses in order to be able to formulate policies, planning, programs, procedures, legislation, provisions, regulations, standards, and measures which relate to land management and urban planning; • Advising, monitoring, and encouraging the coherent implementation of the policies of land management and urban planning throughout Cambodia; • Examining proposed sites for construction; • Proposing plans for technical skill (acquisition) and training for ministerial and provincial/ municipal officials; • Cooperating with international organizations and other organizations.
General Department of Construction	<p>Is responsible for:</p> <ul style="list-style-type: none"> • Maintaining national identity while promoting the modernization of the construction industry; • Undertaking necessary research for the establishment and standardisation of regulations, norms, technical criteria and guidelines, architectural design, and building rules; • Guiding, advising, monitoring, and reviewing construction projects, renovating, rehabilitating, and maintaining of all public organizations and private buildings including patrimony as well as other constructions. The latter shall be defined by Prakas (notices) of the inter-ministerial body; • Administering and controlling the physical and legal persons whose businesses are related to construction and consulting services and to define their technical and professional capabilities and also to grant licenses to these firms; • Controlling and testing construction materials; • Classifying standards and qualities of building materials and equipment whether imported or manufactured locally; • Defining needs in technical training and organize such training for technical personnel of the Ministry and its provincial and municipal offices. Provide technical support to construction and architectural schools and instructions; • Co-ordinating with the Cambodia Development Council to review all investment projects related to construction industry;

General Department of Cadastre and Geography	<p>Is responsible for:</p> <ul style="list-style-type: none"> • Serving as a headquarters of the Ministry of Land Management, Urban Planning and Construction on cadastral and geographical (mapping) affairs; • Researching and developing the provisional regulations related to administration and use of land; • Setting up goals and plans for the work of cadastre and geographical fields; • Carrying out the cadastral surveying and mapping; • Issuing land titles throughout Cambodia; • Carrying out the Cadastral registration and inspection in conformity with the roles, duties, and competence of the General Department of Cadastre and Geography; • Defining parcel boundaries; • Registering state properties; • Collaborating with Department of Personnel and Professional Training Centre for providing technical training and skills to its subordinate staff; • Acting as a headquarters of the Ministry in cooperation with international organizations and other countries in technologies and sciences that serve cadastral and geographical fields; • Cooperating with other ministries and institutions in managing and the use of land.
General Department of Housing (GDH)	<p>Is responsible for:</p> <p>The General Department of Housing was established in 2014 following the adoption of the National Housing Policy. Its mandate is to:</p> <ul style="list-style-type: none"> • Study the current housing situation, present and future (housing) demand and supply, as well as preparing land for housing; • Develop the policy, strategy and legal norms for housing planning; • Cooperate with provincial-municipal state land management committees to resolve temporary constructions on occupied state land in urban areas (with regard to Circular 03, (2010); • Cooperate with state institutions, the private sector to develop legal norms for managing funds and housing loans; • Advise on housing construction and development projects for social purposes; • Follow up and evaluate the implementation of the (housing) policy, strategy, legal norms, and projects related to housing work”; <p>The GDH’s functions are to be delivered via three (2014) and later a fourth (added in 2016) department. These are:</p> <ul style="list-style-type: none"> • The Department of Housing Techniques and Development: Studying quality of informal settlement and improve housing’s conditions • The Department of Housing Regulation, Planning and Cooperative Relations: Planning mechanisms and regulations for improving access to adequate housing • The Department of Housing Foundation and Loans: To be the lead on a “Housing Fund” that aims to help financially poor and vulnerable groups to access adequate settlements • The Department Social Land Concessions (new 2016): To lead on the social land concession issues. <p>The mandates and roles of each department are officially set out in the ministerial Prakas/ sub-decrees (No. 180 and 245) established the GDH in 2014 (and later 2016). It was commented upon (in a training needs document) that a number of the departments had overlapping mandates in terms of:</p> <ul style="list-style-type: none"> • Identification of possible target recipients, • Provision of technical services for housing and infrastructure, • Data collection and monitoring, <p>With each department apparently operating independently of each other rather than in a synergistic manner.</p>

Annex XIX.

Other Legislative Instruments Related to Urban Planning and Land

Other legislative instruments related to urban planning and land are in use in Cambodia:

1. Land Law 2001: Refines and clarifies land ownership and establishes a land administration system.
2. Sechkdey Prakas No. 6, BRK (1999): Aims to control illegal occupation of various lands.
3. Sub-Decree No. 118 ANK/BK (2005): Defines State Land as public and private land.
4. Declaration on Land Policy 2009: Outlines the government's vision for land management.
5. RGC Circular 03 (2010): Addresses temporary settlements on illegally occupied land in urban areas.
6. National Policy on Spatial Planning, 2011: Provides guidelines for spatial planning.
7. National Land Policy "White Paper on Land Policy" (2012): Details the government's land policy.
8. National Policy on Housing (NHP) (2014): Outlines the national housing policy.
9. Sub-Decree No. 42: Governs urbanization of the capital, municipalities, and urban areas.
10. Sub-decree No. 76 ANKr.BK (2015): Modifies certain articles of Sub-decree No 42.
11. National Urban Development Strategy Framework (DRAFT) 2015: Draft strategy for urban development.
12. National Policy on Incentive & Establishment of National Programme for Development of Affordable Housing (2017): Policy on affordable housing development.
13. Prakas No. 087 (2018): Provides guidelines for land development.

14. The Sub-Decree No. 86 on Construction Permits, adopted in 1997, mandates construction permit requirements in cities and provincial towns.

Annex XX.

Municipal Land Use Master Plan (MLUMP) and Land Use Plan Framework

Type of plan	<ul style="list-style-type: none"> The District/Municipal Land Use Master Plan (MLUMP) is the strategic spatial plan for the municipality. It should be well-articulated and aligned to the Provincial Spatial Plan (PSP), it should provide more detailed directions for spatial development in the municipality. Additionally, the Municipal Land Use Master Plan should provide the preparatory basis for the detailed urban area Land Use Plans and comprehensive Sangkat Land Use Plans (SLUPs) in a municipality.
Role and Scope	<ul style="list-style-type: none"> The municipal Land Use Master Plan (LUMP) with the integrated Land Used Plans (LUP) in urban areas is the most important plan for the urban development of any city, town or urban area. In concretizing and addressing the roles and functions of the town as identified in the provincial spatial plan, the LUMP is the key instrument for managing urbanization and sustainable urban development. The municipal LUMP defines general land use types (buildable and control or non-buildable areas) as well as a strategic allocation of land use by main type. It integrates the development of greenery and water systems, of the transport system, as well as of physical and social infrastructure, however subsequent detailed sector plans are needed to concretize and complement the LUMP in particular with regard to transport and physical infrastructure. This can be part of urban detailed plans, for which priority areas will likely result directly from the LUMP. The LUP further complements the LUMP by providing the regulatory framework for construction and use of urban and sub-urban land. It includes regulations for townscape and building structure, such as building coverage ratio, land use index and building heights. The district LUMP will have similar elements as the municipal LUMP when it comes to its urban administrative centre, again building on the identified role and function of the urban centre according to the provincial spatial plan. For the majority of districts in Cambodia, the focus will however be on the rural areas and rural-urban linkages. In this regard the district LUMP builds on the respective direction of the provincial spatial plan, but allows much more detail when developing strategies with regard to land and natural resource management. At the core of this are strategies in line with sustainable watershed management, aiming for the sustainable but productive use of the agricultural areas and the protection oriented use of forest and fishery resources. The district LUMP would further inform where Commune Land Use Planning (CLUP) are most needed and effective, through which it would be further concretized and complemented.
Time Horizon	15 years
Scale	1:50,000 to 1: 25,000
Authority & institutions	<p>A District/Municipal Land Management and Urban Planning Committee initiates the planning process under the supervision of the Municipal council. The committee will not be involved technically in the planning process, so a District/Municipal Land Management and Urban Planning Working Group is (in theory) assigned to prepare the plan.</p> <p>The district/municipal council (and the BoGs) coordinate the process and agree on a draft land use master plan. It then forwards it to the Provincial Council through the Provincial Committee for Land Management and Urban Planning for agreement. After this double agreement process, the plan is submitted to the National Committee for Spatial and Urban Planning for final approval.</p>
Process	<p>The design planning process to produce</p> <ul style="list-style-type: none"> A Municipal Land Use Master Plan (MLUMP) comprises a sequence of nine (9) steps with 28 tasks which should be undertaken (indicative timings) over the course of approximately (785 days) 26 months. Assuming a smooth and uninterrupted planning process. The division of the process into nine steps and this indicative timing are based on a National Committee for Land Management and Urban Planning and Construction (NCLMUPC) 2013 Directive. The (likely) parallel Municipal Land Use Plan (MLUP) also envisages a nine-step, 17 task process taking 665 days (22 months) under the same directive, the envisaged shorter timeframe is due to the fact that the MLUP utilises a lot of the same materials as the MLUMP process.

Annex XXI.

Sangkat Land Use Plan (SLUP) Framework

Type of plan	<ul style="list-style-type: none"> The Sangkat land use plan (SLUP) refers to a land use plan within the respective commune/sangkat level and covers both state and privately owned land (Royal Government of Cambodia 2008). The plans are conceived to support the design and the implementation of the 5-year Sangkat Development Plan (SDP) and the three-year rolling Sangkat Investment Plan (SIP).
Role and Scope	<p>The SLUP shall comply with the development plans of the commune/sangkat and indicate the spatial dimension of development initiatives and projects that are foreseen in the SDP/ SIP and are based on the specific resources or characteristic of the area. The SLUP is a tool for the Commune/Sangkat Council to effectively manage and use natural resources and land resources in order to support sustainable and equitable socio-economic development planning, contributing to poverty reduction. The envisaged scope of a SLUP (based on a 2008 GIZ drafted Implementation Manual on Commune/Sangkat Land Use Planning) are:</p> <ul style="list-style-type: none"> Analysis of the existing situation in the Sangkat. Validate and update present land cover/ use map (incl. infrastructure, land concessions, protected areas, community forestry etc.). Analyses of potentials (Economic Land Concessions (ELC), Social Land Concession (SLC) areas, agricultural improvement, community fishery, etc.) and constraints (ELC, poor land conditions, land conflicts, poor market conditions, poor infrastructure networks). Outline future land use options. Implementation plan (as part of CDP/CIP¹) where future development projects are identified on a present land use map, linked to proposed implementation steps and timings. The so-called Problem/Cause/Solution (P/C/S) Framework and map is central in the SLUP process (GIZ 2008). These should display the range of problems identified by the Sangkat and villagers during the problem/cause/solution analysis and takes the form of a sketch map superimposed on top of the simplified present land use map, with symbols corresponding to a problem/cause/solution table describing the nature, scale and cause of each problem.
Time Horizon	10-20 years
Scale	From 1:10,000 to 1:30,000 depending on Sangkat size
Authority & institutions	The SLUP is developed under the authority of the Sangkat Council in close alignment with the SDP/SIP ² process. The plan is then submitted to a Municipal Working Group for revision and the Provincial State Land Management Committee for approval. The reason why the institutions slightly differ from those in the PSP and district/municipal LUMP and LUP is that the SLUP process was developed and translated into the legal framework well before the Spatial Planning Policy was developed.
Process	The preparation of SLUPs is envisaged to follow a 11-step process aligning (and updated) with the Sangkat development and investment planning process, which is undertaken at the start of each five year Sangkat mandate and updated annually as (anticipated) investments are made.

1 Cambodia's Development Plan (CDP)/ Cambodia's Investment Plan (CIP)

2 Site Improvement Plans (SIP)

Annex XXII.

Sustainable (“Green Growth”) Urban Development Framework

Components/ Covering		
Strategic Objective	Integrated Urban Planning and Green Infrastructure Development	<ol style="list-style-type: none"> 1. Urban design, land-use and neighbourhood planning 2. Sewage and drainage systems and waste management 3. Water supply and transport 4. Communications and energy supply 5. Climate change
	Green Local Economy	<ol style="list-style-type: none"> 1. Renewable energy and energy efficiency 2. Eco-tourism, natural assets, and cultural heritage 3. Green businesses and enterprises
	Social Inclusion	<ol style="list-style-type: none"> 1. Equitable accessibility (to public infrastructure and basic services) 2. Affordable housing and education 3. All stakeholder engagement
	City Governance	<ol style="list-style-type: none"> 1. Financial capacity (green project implementation) 2. Institutional capacity 3. Information, knowledge and best practice sharing

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Profile of PolyUrbanWaters

PolyUrbanWaters is a research and project network funded by the German Federal Ministry of Education and Research (BMBF) that consists of academic institutions, municipalities, local and national government agencies, civil society and private-sector stakeholders from Indonesia, Cambodia, Laos, Thailand, Vietnam and Germany.

PolyUrbanWaters responds to the strong need to generate deeper, transferable and scalable know-how for the effective localization of polycentric approaches to urban water resources management in secondary and tertiary cities of the SEA region.

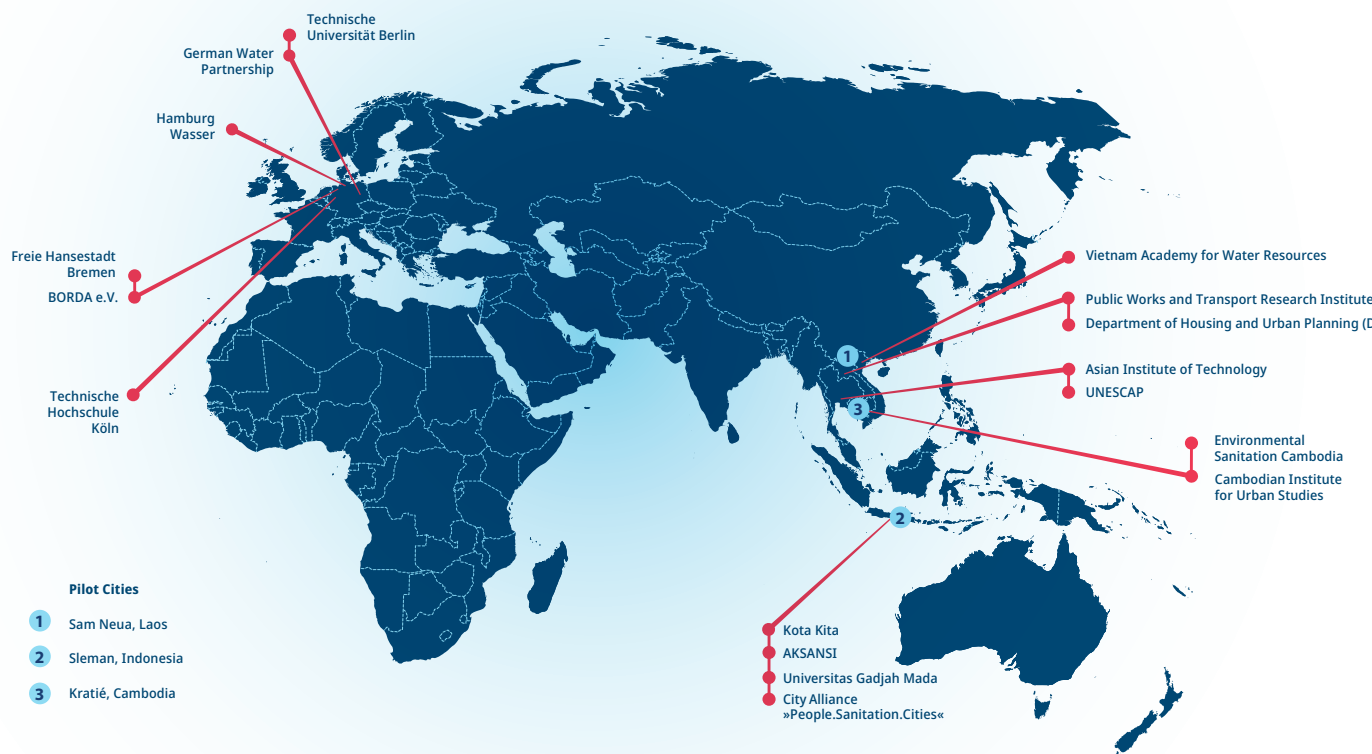
The project intends to demonstrate the importance of polycentric approaches to the management of urban water resources, contributing to the water-sensitive transformation of secondary and tertiary cities in SEA towards resilient, inclusive and livable urban areas, thus contributing to the fulfillment of national and global sustainability agendas.

In order to do this, the project will elaborate an empirically proven conceptual framework for these approaches with: a) development of relevant instruments for its implementation and scalability; and b) a sustainable contribution to the systematic emergence of a new interdisciplinary practice-oriented research and economic-academic cooperation context.

The PolyUrbanWaters international research collaboration focuses its research activities around three Living Labs located in Sleman (Indonesia), Sam Neua (Laos) and Kratié (Cambodia), which provide a representative cross-section of the challenges faced by fast-growing secondary and tertiary cities in the SEA region in diverse governance contexts. Within this framing, PolyUrbanWaters pursues the following core

questions:

1. How can a diverse set of stakeholders contribute to building an inter- and transdisciplinary local knowledge base on water and urban development-related challenges in the SEA region? How can this knowledge be systematized, scaled and regularly updated to serve as a basis for inclusive and future-oriented municipal planning approaches across the region?
2. How can effective and sustainable water-sensitive urban development be fostered through a combination of centralized and decentralized technical and social-ecological innovations – including nature-based solutions, participatory strategic planning and effective water management structures – as an integral part of a systemic polycentric nexus approach (water, waste, energy, housing, IT, food, community development, etc.) and innovative financing schemes for the management of urban waters?
3. How can “water” serve as a strategic entry point to integrated, inclusive and resilient urban development that is guided by the SDG framework? Which polycentric, intersectoral and participatory governance approaches are required to plan, develop, sustainably operate and finance integrated, water-sensitive development with the capacity to evolve further in line with dynamic urbanization processes?
4. How can local innovation processes inform new practice-oriented pedagogies, capacity building approaches and research agendas to strengthen a network of academic institutions in the region?



The PolyUrbanWaters-Partner Network and Pilot Cities

The economic development and liveability of Krong Kratié is highly dependent on the sustainable management of its eco-systems and its water resources. These have come under pressure in the wake of considerable changes in land use in the region over the past century and recent increasing urbanization. Furthermore, these pressures may increase considerably due to the manifestations of the impacts of climate change.

