

Capacity Mapping for Monitoring and Assessment of Plastic Pollution



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❑ Framework of capacity mapping

❑ Summary of findings

❑ Conclusion

❑ Recommendation and action

- *support decision and*
- *capacity building*

...for promotion of countermeasures to prevent plastic litter leakage into the Mekong River.

What you should expect?



Mapping capacities for monitoring and assessment of plastic pollution?

Table 1. Waste estimates for 2010 for the top 20 countries ranked by mass of mismanaged plastic waste (in units of millions of metric tons per year).

Econ. classif., economic classification; HIC, high income; UMI, upper middle income; LMI, lower middle income; LI, low income (World Bank definitions based on 2010 Gross National Income). Mismanaged waste is the sum of inadequately managed waste plus 2% littering. Total mismanaged plastic waste is calculated for populations within 50 km of the coast in the 192 countries considered. pop., population; gen., generation; ppd, person per day; MMT, million metric tons.

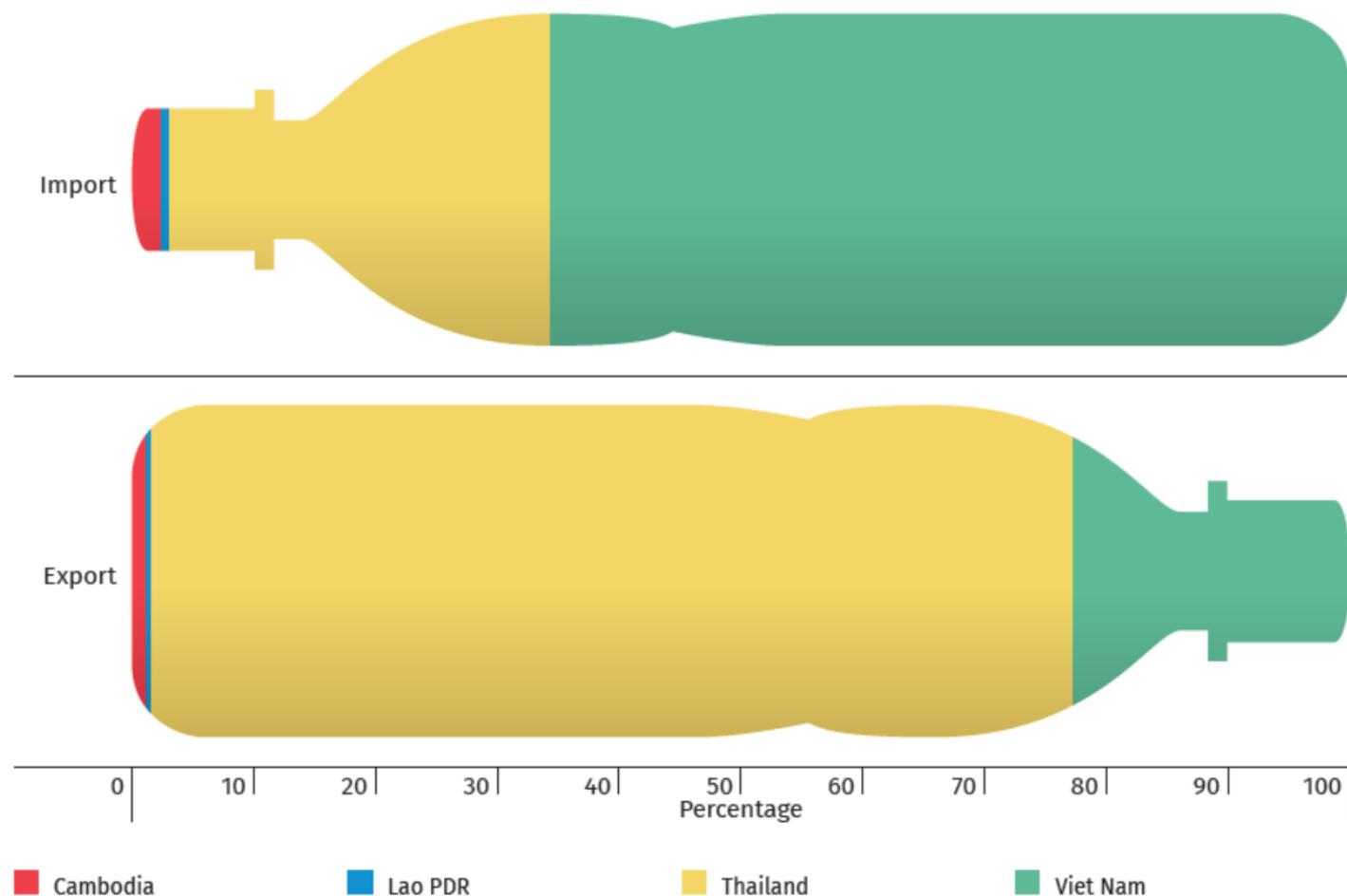
Jambeck et al., 2015

Rank	Country	Econ. classif.	Coastal pop. [millions]	Waste gen. rate [kg/ppd]	% plastic waste	% mismanaged waste	Mismanaged plastic waste [MMT/year]	% of total mismanaged plastic waste	Plastic marine debris [MMT/year]
1	China	UMI	262.9	1.10	11	76	8.82	27.7	1.32–3.53
2	Indonesia	LMI	187.2	0.52	11	83	3.22	10.1	0.48–1.29
3	Philippines	LMI	83.4	0.5	15	83	1.88	5.9	0.28–0.75
4	Vietnam	LMI	55.9	0.79	13	88	1.83	5.8	0.28–0.73
5	Sri Lanka	LMI	14.6	5.1	7	84	1.59	5.0	0.24–0.64
6	Thailand	UMI	26.0	1.2	12	75	1.03	3.2	0.15–0.41
7	Egypt	LMI	21.8	1.37	13	69	0.97	3.0	0.15–0.39
8	Malaysia	LMI	22.0	1.52	12	57	0.84	2.0	0.14–0.37

Catchment	Country	Lower mass input estimate (tyr ⁻¹)	Midpoint mass input estimate (tyr ⁻¹)	Upper mass input estimate (tyr ⁻¹)	Total catchment surface area (km ²) ²¹	Yearly average discharge (m ³ s ⁻¹) ²¹
Yangtze	China	3.10 × 10 ⁵	3.33 × 10 ⁵	4.80 × 10 ⁵	1.91 × 10 ⁶	1.58 × 10 ⁴
Ganges	India, Bangladesh	1.05 × 10 ⁵	1.15 × 10 ⁵	1.72 × 10 ⁵	1.57 × 10 ⁶	2.08 × 10 ⁴
Xi	China	6.46 × 10 ⁴	7.39 × 10 ⁴	1.14 × 10 ⁵	3.89 × 10 ⁵	5.53 × 10 ³
Huangpu	China	3.35 × 10 ⁴	4.08 × 10 ⁴	6.73 × 10 ⁴	2.62 × 10 ⁴	4.04 × 10 ²
Cross	Nigeria, Cameroon	3.38 × 10 ⁴	4.03 × 10 ⁴	6.5 × 10 ⁴	2.38 × 10 ³	2.40 × 10 ²
Brantas	Indonesia	3.23 × 10 ⁴	3.89 × 10 ⁴	6.37 × 10 ⁴	1.11 × 10 ⁴	8.18 × 10 ²
Amazon	Brazil, Peru, Columbia, Ecuador	3.22 × 10 ⁴	3.89 × 10 ⁴	6.38 × 10 ⁴	5.91 × 10 ⁶	1.40 × 10 ⁵
Pasig	Philippines	3.21 × 10 ⁴	3.88 × 10 ⁴	6.37 × 10 ⁴	4.07 × 10 ³	2.07 × 10 ²
Irrawaddy	Myanmar	2.97 × 10 ⁴	3.53 × 10 ⁴	5.69 × 10 ⁴	3.77 × 10 ⁵	5.49 × 10 ³
Solo	Indonesia	2.65 × 10 ⁴	3.25 × 10 ⁴	5.41 × 10 ⁴	1.58 × 10 ⁴	7.46 × 10 ²
Mekong	Thailand, Cambodia, Laos, China, Myanmar, Vietnam	1.88 × 10 ⁴	2.28 × 10 ⁴	3.76 × 10 ⁴	7.74 × 10 ⁵	6.01 × 10 ³

Lebreton et al., 2017

Import and Export of 39 Plastics and articles thereof in Lower Mekong Countries in 2018



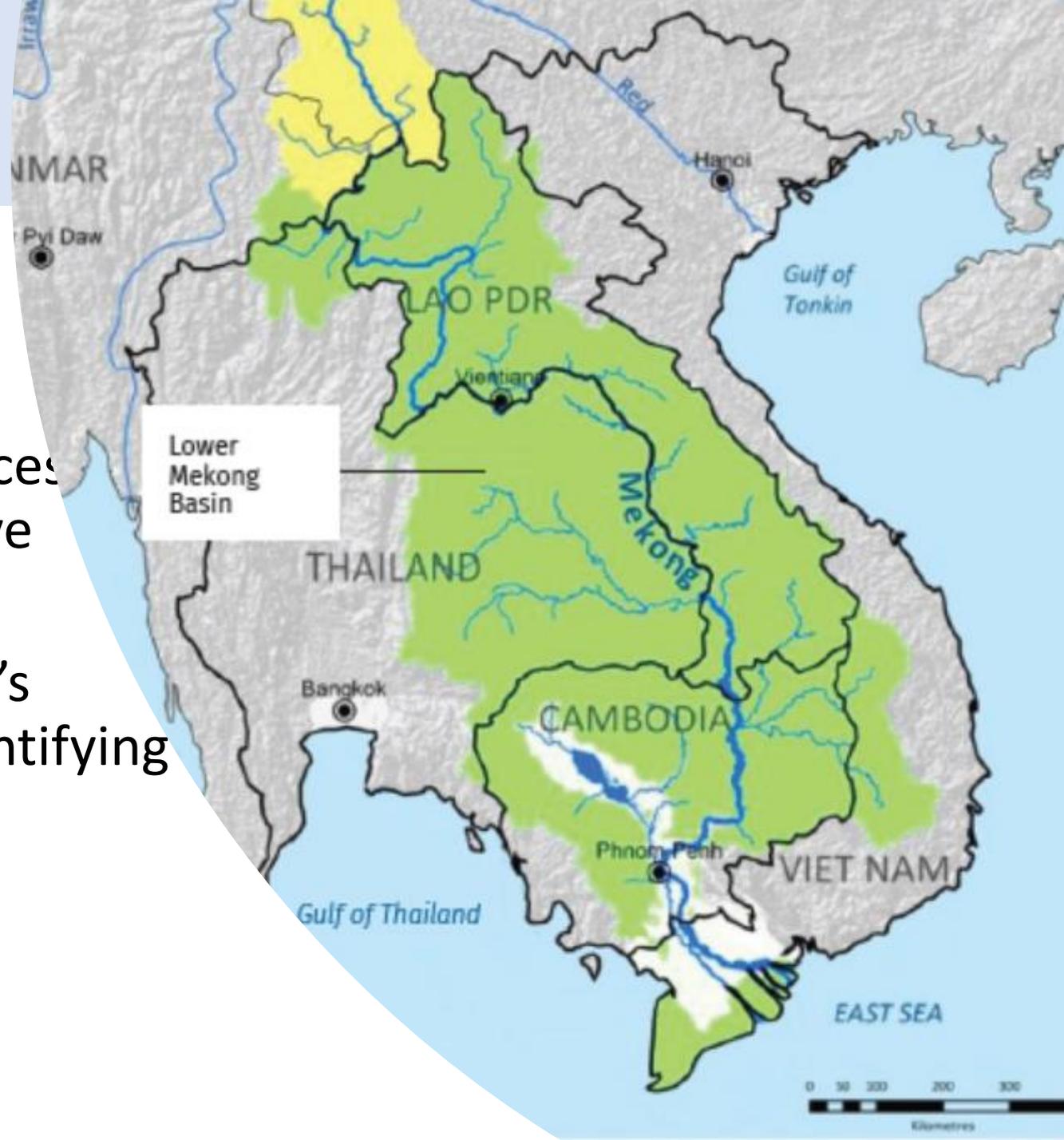
- **Viet Nam** has a high importation of plastics amounting to about 15.3 billion USD, followed by **Thailand** of about 7.3 billion USD.

- **Thailand** has a high exportation trade of about 14 billion USD compared to other 3 Mekong countries

(Source: Extracted from ASEAN <https://data.aseanstats.org/trade-quarterly>)

Capacity Mapping definition

- Strategy to identify and scope resources required to achieve specified objective
- An analysis of a country, organization's structure and resources aimed at identifying its inherent abilities and potential to undertake a specific task



What could Monitoring and Assessment mean?

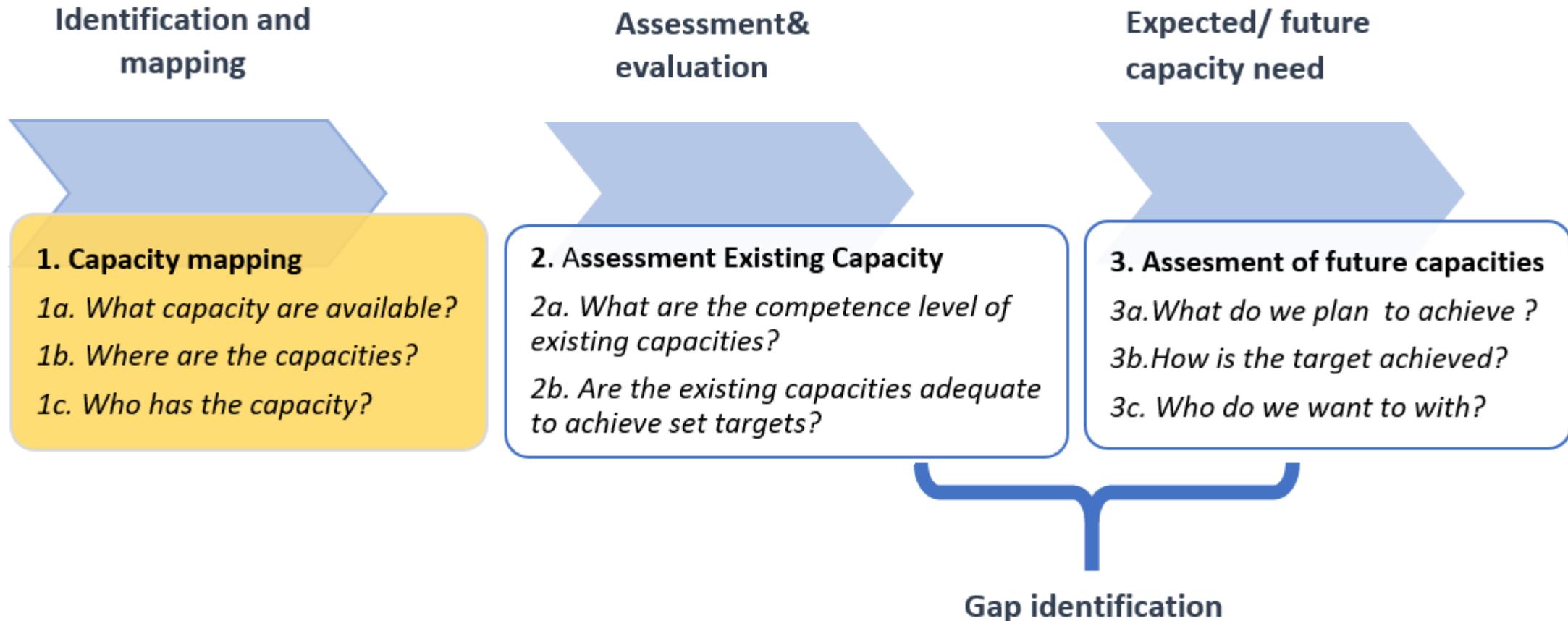
■ **Monitoring**

...the repeated measurement of a characteristic of the environment, or of a process, in order to detect a trend in space or time.

■ **Assessment**

.....process whereby the results of a monitoring programme are analysed and used to inform the decision-making process

Capacity needs assessment process (adapted from UNDP guidelines & FAO guidelines)



Objective

To scope, identify, analyse and map out the existing capacities for monitoring and assessment of riverine plastic waste in the 4 target countries in the lower Mekong Region



Linkage with project

Model CounterMeasure

1. Data collection to identify plastic leakage and hotspots in target cities and rivers
 - A. Desk work
 - B. Field Survey
2. Leakage scenario development
 - A. Analysis of data collected in number A above
 - B. Scenario development

Mumbai, Genghis &
Yamuna River Basins

Mekong River Basins

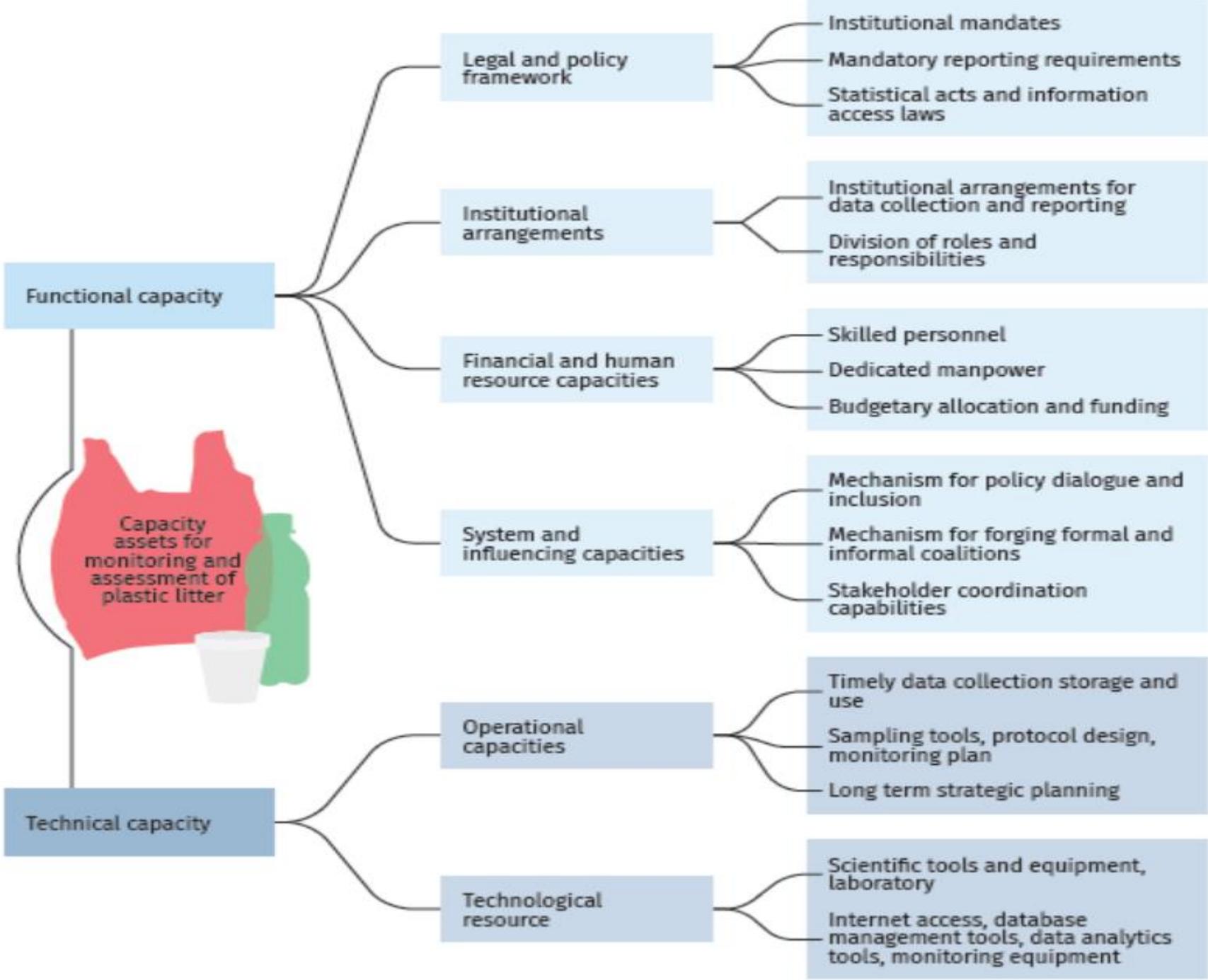
Plastic Leakage Assessment and Monitoring in
River Basins in Asia

Monitoring and assessment
of land based plastic leakage

Approach for
marine/riverine Litter
Hotspot Assessment

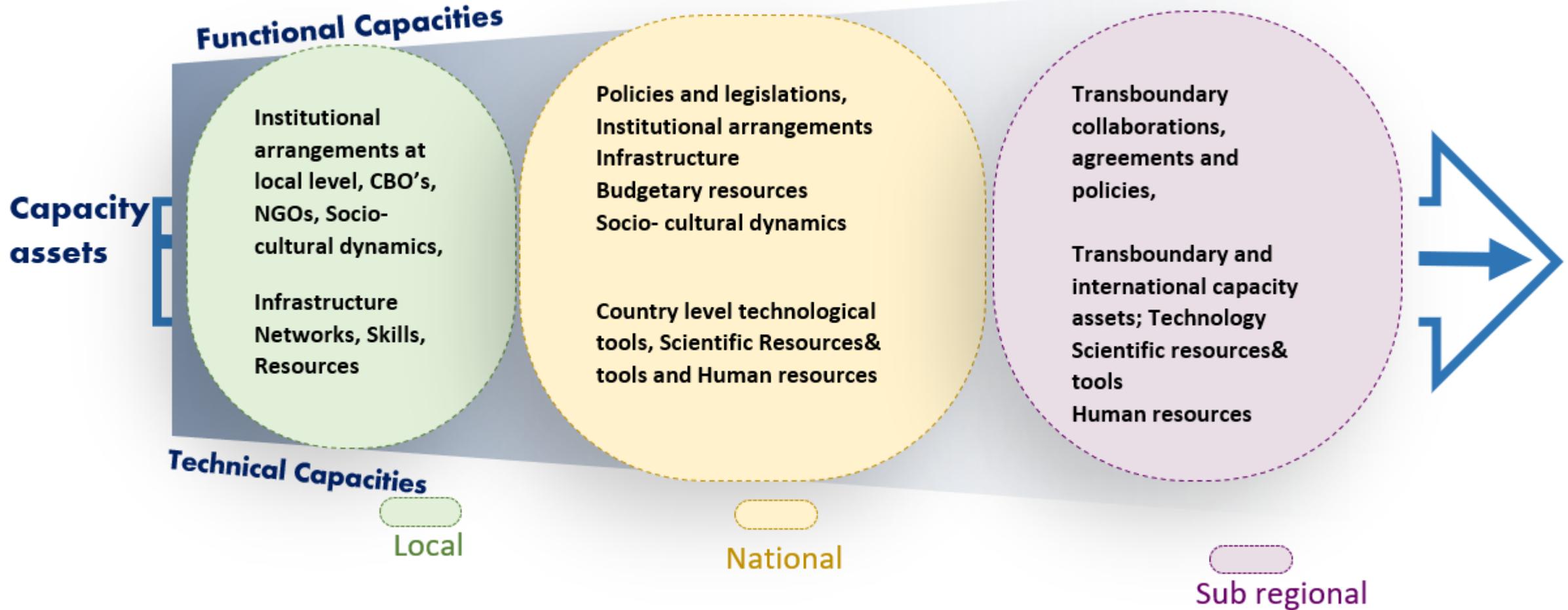
Accurate monitoring
protocols, sampling
methodologies, data storage
and dissemination.

Mapping of capacity assets for monitoring & assessment of plastic litter leakage



Mapping the dimensions of capacity assets

Mapping of existing and latent capacities in target countries



Data collection analysis strategy

- Designed survey -capacity mapping framework
- Developed possible indicators - scope, analyse and map capacity assets
- Key technical experts & country focal experts engaged to draw-out data and information on capacity assets & latent capacities
- Employed to draw out existing capacity assets in each country to support plastic litter monitoring and assessment

Planning

Desk review

Technical workshop

Country group discussions

Planning

- Policy instruments published reports
- Planning documents
- Organization websites
- Snowballing technique



Capacity Mapping tool

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
					Attribute		Colour code	Community	Provincial/capital city	Central/National	Community	Provincial/capital city	Central/National	Community	Provincial/capital city	Central/National	Community	Provincial/capital city
	Legal framework																	
4	Key question																	
5			1	a	Existence of implementing rules and guidelines for laws on environmental (solid waste/plastic) monitoring and assessment.													
6	Are there existing legal frameworks support environmental monitoring and assessment?		2	b	Decentralized legal mandate for operation, and enforcement of legal provision on environmental (solid waste/plastic waste) monitoring and assessment.													
7			3	c	Clarity of policy and legal framework on institutional mandate and conduct of environmental (solid waste/plastic waste) monitoring and assessment.													
8			4	d	Existence of transboundary/regional and sub regional legal frameworks for monitoring and assessment of solid waste/plastic waste.													
9	Policy framework																	
12	Key question																	
13			1	a	Existence of monitoring guidelines, procedures for relevant policies on environmental monitoring and assessment.													
14	Do relevant environmental policies provide frameworks and clear actionable plans for solid waste/plastic waste monitoring and assessment?		2	b	Clarity and awareness of policy objective and implementation guidelines and among institutional and heads.													
15			3	c	Dedicated resources and mandates to support capacity development plans and implementation.													
16	Institutional arrangements																	
19	Key question																	
20			1	a	Existence or otherwise of multiple layers bureaucratic procedures.													
21	Are there functional are intra- and or inter-government agency coordination, (solid waste/plastic waste) on monitoring and		2	b	Clearly defined institutional roles and responsibilities regarding monitoring and assessment of plastic waste.													
22					Mechanisms and steering committees for monitoring and													



Visualization of summaries of capacity assets of Lower Mekong Countries [1]

	Cambodia	Lao PDR	Thailand	Viet Nam
<p>Legal and policy framework Key question: <i>Do relevant environmental policies provide frameworks and clear actionable plans for solid waste/plastic waste monitoring and assessment?</i></p>	<p>Policy provisions made are not specific to the conduct of plastic pollution assessment and monitoring. Solid waste management laws are mostly applied in plastic waste management</p>		<p>Policy provisions not specific to plastic pollution assessment and monitoring. Existing policy frameworks include roadmaps and action plans for plastic pollution management</p>	
<p>Institutional arrangement Key question: <i>Functional blueprint for intra- and or inter- government agency coordination, (solid waste/plastic waste) on monitoring and assessment of solid waste/plastic litter monitoring and assessment?</i></p>	<p>No functional blueprint for inter- and intra- agency collaborations on plastic pollution assessment and monitoring. Institutional collaboration and overlapping roles on solid waste management engagements</p>		<p>There are no specific protocol or procedures for cross sectoral collaborations for plastic pollution assessment and monitoring. However, there is an active multi-stakeholder engagement on plastic waste management.</p>	
<p>Financial and human resource Key question: <i>Resources; operational arrangement necessary to set up, sustain and maintain systematic monitoring and assessment of plastic litter</i></p>	<p>Lack of budget and human resources, lack of skills. Dedicated financial resources for plastic pollution assessment and monitoring not available. Local and national sources of financing plastic pollution programmes are mostly supported by international development partners.</p>			
	Present	Partially present	Not present	Not present



Visualization of summaries capacity asset of Lower Mekong Countries [2]

	Cambodia	Lao PDR	Thailand	Viet Nam
<p>Systems and influencing capacity Key question: <i>Mobilization of knowledge, and expertise relevant to meet strategic objectives and the needs of plastic litter monitoring and assessment programmes?</i></p>	<p>Need to strengthen mechanisms for policy dialogue and inclusive contribution to policy</p> <p>Forging formal and informal coalitions coordination and management</p>		<p>Policy dialogue and inclusive contribution to policy</p> <p>Strong private and public sector institutional coalitions on plastic waste management</p>	
<p>Operational capacity Key question: <i>Operational arrangements available to running monitoring and assessment programmes of plastic litter?</i></p>	<p>Lack of adequate technological resources within public sector setting to conduct plastic pollution assessment and monitoring</p>			
<p>Technological resources Key question: <i>Technologies and instruments are available for implementing protocols for monitoring and assessment of plastic litter?</i></p>	<p>Inadequate manpower and skilled labour to implement plastic monitoring and assessment.</p> <p>Long-term strategic plans, result based planning</p>			
	Present	Partially present	Partially present	Not present

Conclusion

- Plastic waste management has been **traditionally managed as a fraction of solid waste**
- Recent highlight of **plastic pollution challenges** has stimulated a shift to **plastic waste management**
- Waste management in the Lower Mekong is **practiced within a decentralized context**
- Existing legislative frameworks across the LMC **focused on applying 3R concepts** - curb increasing plastic waste
- Little to **no capacities available for carrying out plastic litter leakage monitoring** within the government institutional settings
- **Unclear institutional mandates leading to overlapping responsibilities** have been observed in all four Mekong countries

Recommendations and practice

- **Capacity building efforts for plastic pollution assessment & monitoring** in the Lower Mekong
- **Legal reforms & amendments must be considered** in setting up plastic monitoring and assessment programmes
- Thrust for the development of evidence-based policies for impact must stem **from strong commitment to stakeholder engagement, partnership & consensus-building**
- Legislations for plastic pollution management need to incorporate elements for monitoring of plastic pollution with **key functional decentralize mandate to subnational waste management authorities**
- **Technical guidelines, action plans and roadmaps for implementation of legislation and policies at local levels** must be developed to provide the enabling environment
- **Countries must focus on closing gaps between institutional and investment needs and opportunities** by exploring innovative transparent funding models, including PPP's models gaps between institutional and investment need and opportunities.

Recommendations and practice

- **Promote full fiscal decentralization to support the implementation of policies and programmes** at local level
- **Sustainable and viable funding options** must be drawn up to support monitoring and assessment of plastic litter programmes in the Lower Mekong Basin
- Capacities **of subnational organisations, and research institutions** having experience in pollution monitoring can be tapped to strengthen and improve the development of country level capacities
- Development and implementation of **long-term plastic pollution assessment and monitoring** require dedicated budget and long-term funding
- **Institutional arrangements** for plastic assessment and monitoring may adopt a cross-sectoral and interdisciplinary approach
- **Harmonized protocols must be developed to ensure consistency** in the application of monitoring standards and methods
- **Networks of institutions with existing monitoring capacities** could be tapped





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Other references and sources of data and information may be provided upon request