



National University of Laos
Faculty of Environmental Science

1st Conference on
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THAMMASAT UNIVERSITY
Faculty of Social Administration

PLASTIC WASTE LEAKAGE INTO THE MEKONG RIVER: SOURCES, HOTSPOTS, AND POLICY GAPS

A CYCLE OF PLASTIC WASTE MANAGEMENT IN THE MEKONG BASIN

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What is Happening IN THE MEKONG BASIN?

- Mekong region plastic leakage is among the highest globally.
~18,800 to 37,600 tonnes/year [UNEP (2020)]
- Major leakage from urban areas, tourism, and agriculture.
World Bank (2022)
- Waste mismanagement rates remain high (30–70%) in many
Mekong countries. Jambeck et al. (2015).
- River transport dynamics carry plastic downstream to the delta
Mekong River Commission (MRC) — State of Basin Report (2018).

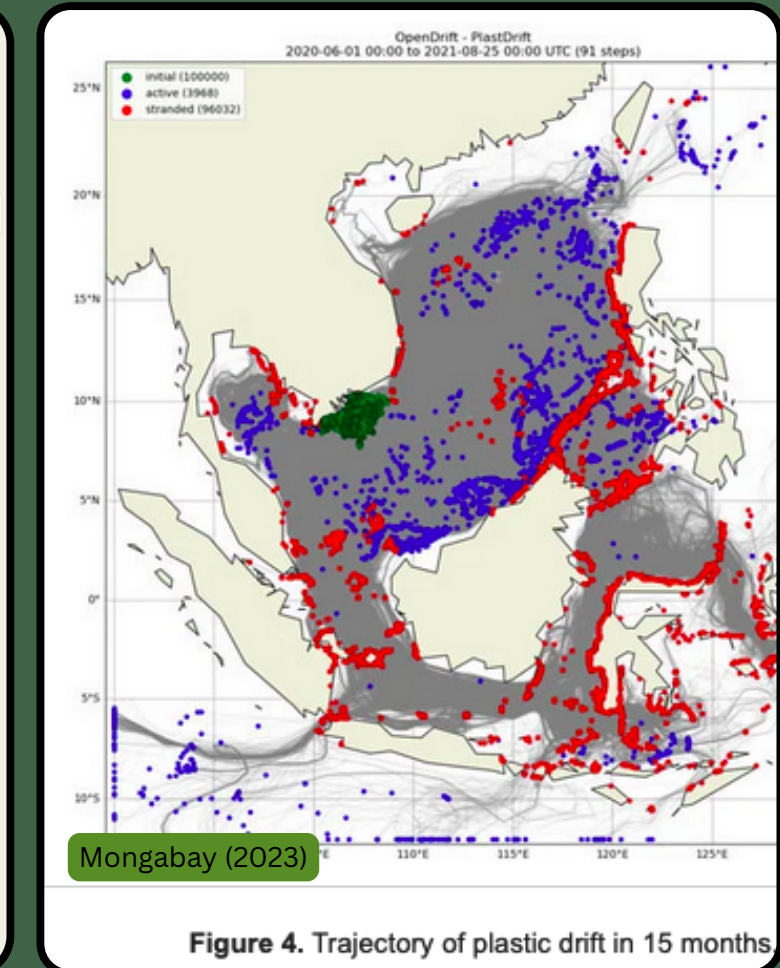


Table 1.1. Top 10 rivers transporting marine plastic debris

Rank	Name of the river	Microplastic load Model 1 [tonnes y-1]	Microplastic load Model 2 [tonnes y-1]	Macroplastic load [tonnes y-1]
1	Chang Jiang (Yangtze River)	85,440	1,469,481	69,282
2	Indus	12,378	164,332	11,977
3	Huang Hec (Yellow River)	9,678	124,249	9,561
4	Hai He	7,434	91,858	7,515
5	Nile	6,919	84,792	7,043
6	Meghna, Bramaputra, Ganges	6,039	72,845	6,230
7	Zhujiang (Pearl River)	4,577	52,958	4,823
8	Amur	3,429	38,267	3,708
9	Niger	3,185	35,196	3,469
10	Mekong	3,044	33,431	3,330
Total		142,123	2,167,409	126,938

Source: Schmidt et al. (2017)



What has it caused? Why does it matter?

Plastic Pollution in the Mekong Basin affects

- Water Quality
- Public Health
- Biodiversity
 - Plastic ingestion was documented in 18% of sampled fish.
- Tourism attraction/ national image of member states

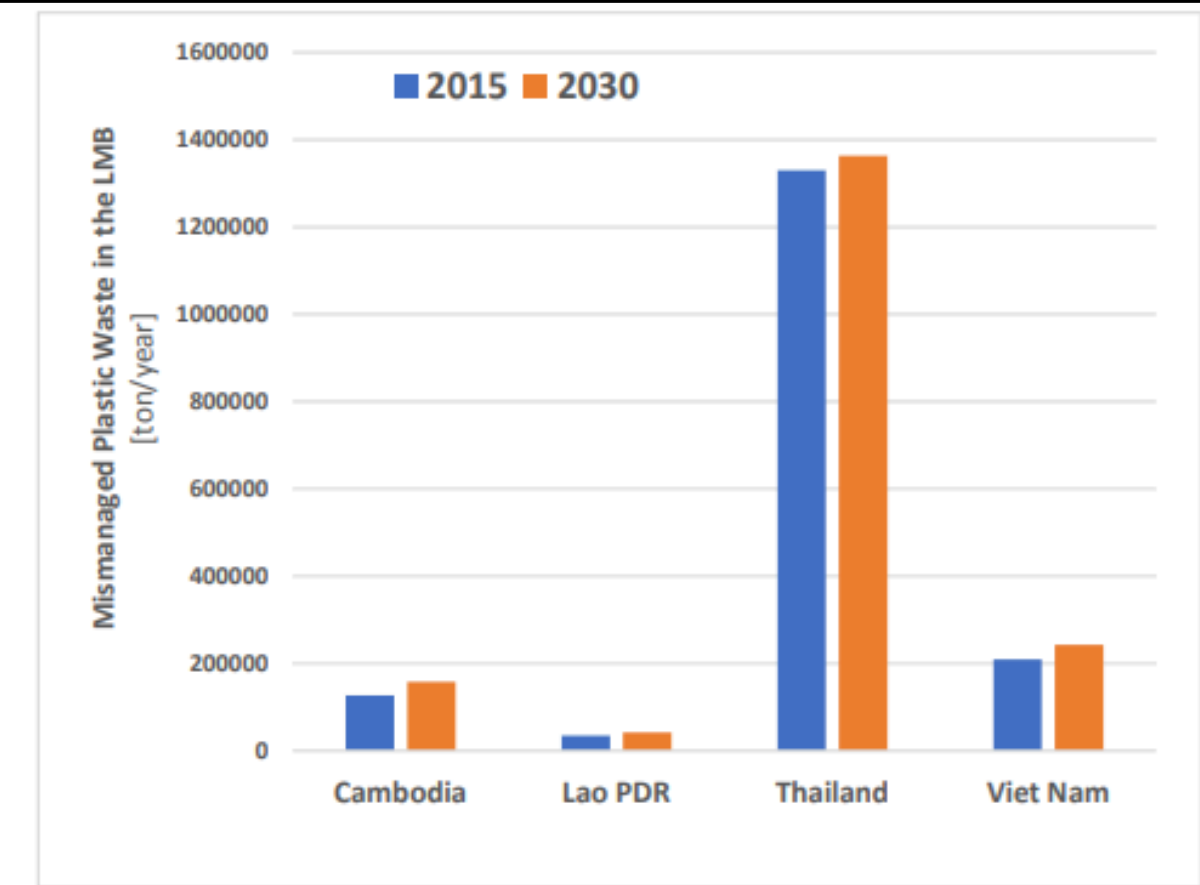


Figure 2.12. Estimated amount of mismanaged plastic waste in the LMB from each Member Country

Sources: Jambeck et al. (2015), MRC (2016), Schmidt et al. (2017), World Bank (2018b; 2020)

Indicator	Finding / Data
Water Microplastic Levels	2–64 particles/m ³ (increasing downstream)
Hotspots	Urban areas: Bangkok, Can Tho, Vientiane, Battambang
Plastic Share in River Waste	70–90% plastic in sampled river waste
Biodiversity Risk	1100+ freshwater species exposed to contamination



RESEARCH GAP



Terrestrial



Aquatic

1. The need for in-depth analysis of plastic waste management in the Mekong Basin, especially the source, hotspot, and policy collaboration
2. Most research focuses on the domestic scale, not the whole regional basin systems

Therefore, we need to

- expand knowledge on how the whole basin pollution contributes a massive accumulation
- point out clearly the policy gaps and cross-boundary pollution management



Research Question and Objectives

Research Question:

What factors enable effective policy responses across the Mekong Basin's plastic waste management cycle?



Plastic accumulated in the Mekong River
Santa Barbara Independent (2019)



James Forest (2025)

Research Objectives:

To analyze the plastic waste cycle and the key governance and policy gaps shaping effective plastic management in the Mekong Basin.



Methodology: Scope, Data Collections, and Analytical Technique



Study Scope

Focusing on the cycle of plastic waste management in the Regional context of the Mekong Countries



Data Collection

The year from 2015-2025: Data from MRC, World Bank, Scholars

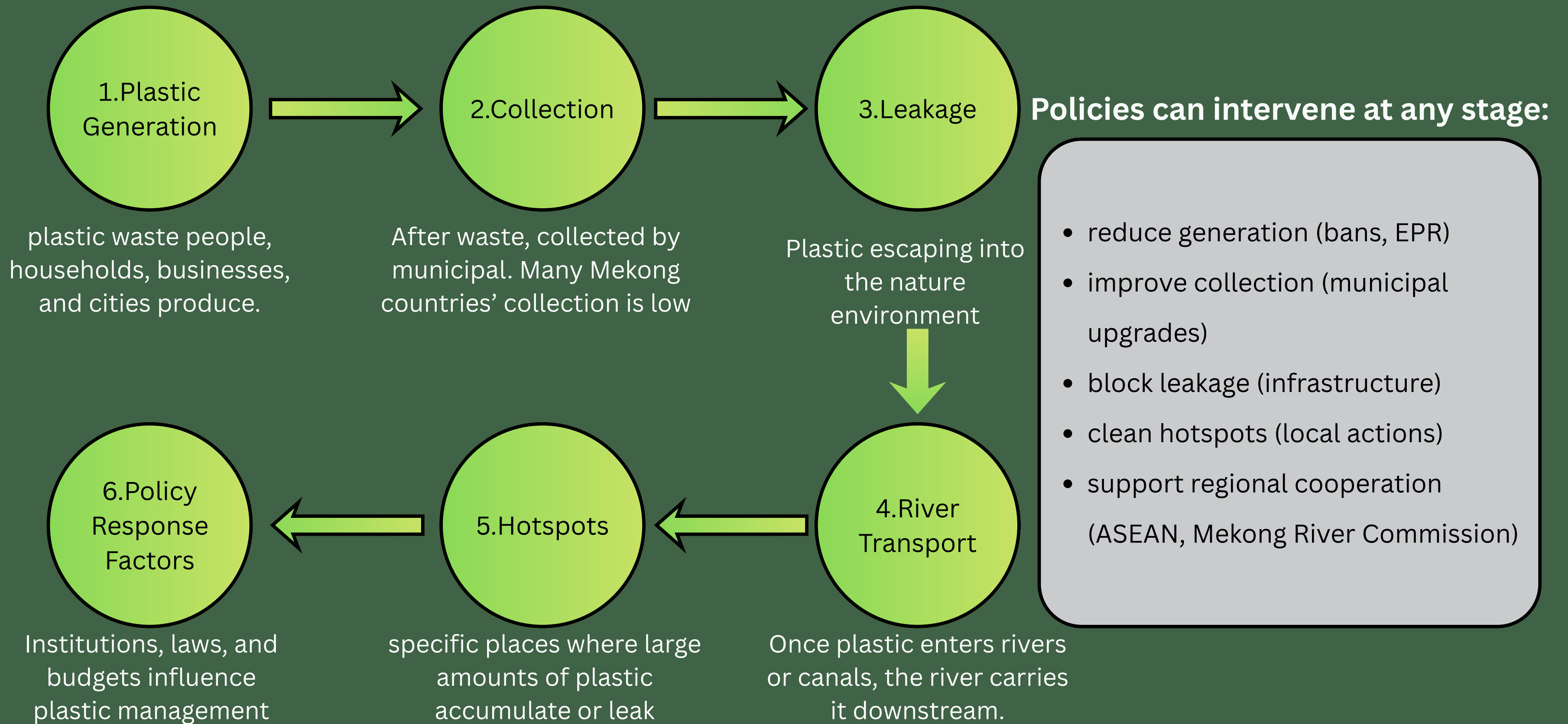


Analytical Technique

Desk review with analysis from regional and international documents



6. Analytical Framework



Key Finding(1)

Plastic leakage is not confined to a single point but occurs throughout the waste management cycle

- Major leakage happens during collection gaps, open dumping, and informal waste disposal near rivers.
- Seasonal flooding and river hydrology amplify leakage and carry waste downstream into hotspots.
- Collection systems are significant sources of leakage, especially when infrastructure is insufficient or containers are uncovered



Innoeit Travel (2019)

Key Finding(2)

Policy fragmentation across Mekong countries weakens overall management

- Lack of cross-border governance results in each country focusing only on local waste, ignoring basin-scale impacts.

Weak Multi-level Governance and Policy Coordination

- No unified Mekong-wide plastic action plan.
- Local governments lack budget, equipment, and enforcement authority.
- National strategies exist, but implementation varies widely.
 - ASEAN (2019) Regional Marine Debris Framework



Coconut Bangkok (2025)



Key Finding(3)

- Community engagement and local recycling initiatives significantly reduce leakage but remain limited in scale.

Enabling factors—like institutional coordination, financing, and public participation—directly shape policy effectiveness

Importance of Community Participation & Behavior Change

- Community-led segregation and river cleanups have a measurable impact but remain small-scale.
- Lack of public awareness → littering, drainage dumping, and festival waste peaks.
 - UNEP, 2020; Singh & Chok, 2020





8.CONCLUSION

- **Plastic leakage occurs at multiple points in the waste cycle**
 - especially during collection gaps, open dumping, riverside settlements, and markets.
- **Hotspots emerge due to river hydrology**
 - flood pulses, flow velocity, and tributary networks carry waste downstream.
- **Institutional and economic factors shape policy effectiveness**
 - coordination mechanisms, financing models, public participation, and recycling markets influence outcomes.



Times of India (2016)



9. RECOMMENDATION



Kiri Travel (2023)

Implementations	Sample models
Establish a Mekong Regional Plastic Monitoring System (MRC)	The Rhine River (Europe): Germany, Switzerland, France, and the Netherlands- unified monitoring system → 95% microplastic reduction (2015-2020)
Strengthen Waste Collection & Infrastructure	Indonesia (Bali & Java Villages)- Material Recovery Facilities (MRFs)→reduced 30-40% leakage.
Scale Up Community Engagement & Behavior Change	Philippines “Plastic-Free Schools Programs”: 10,000+ schools → reduced school plastic waste by 45% in 2 years
Introduce Regional Extended Producer Responsibility (EPR)	South Korea EPR system : The manufacturers pay the Recycling Fee on packaging - recycling rate increased from 39% → 69%



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THANK YOU!

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