



Industrial Wastewater Management in Lao PDR

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Outline of Presentation

- Background
- Inventories of industrial wastewater
- Challenges and obstacles
- Conclusions and Recommendations

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Country Information

Area (km ²)	236,800	
Population	About 7 m (2013)	
Mean annual precipitation (mm)	1,600	
Renewable water resources (m ³)	270 billion	
Total water withdrawal (m ³)	5.7 billion	
Water use by sectors	Agriculture	90%
	Industry	6%
	Domestic	4%

Industrial/Factory in Lao PDR

- 454 Large scale
- 582 Medium scale
- 9,157 Small scale
- 27,903 Household business

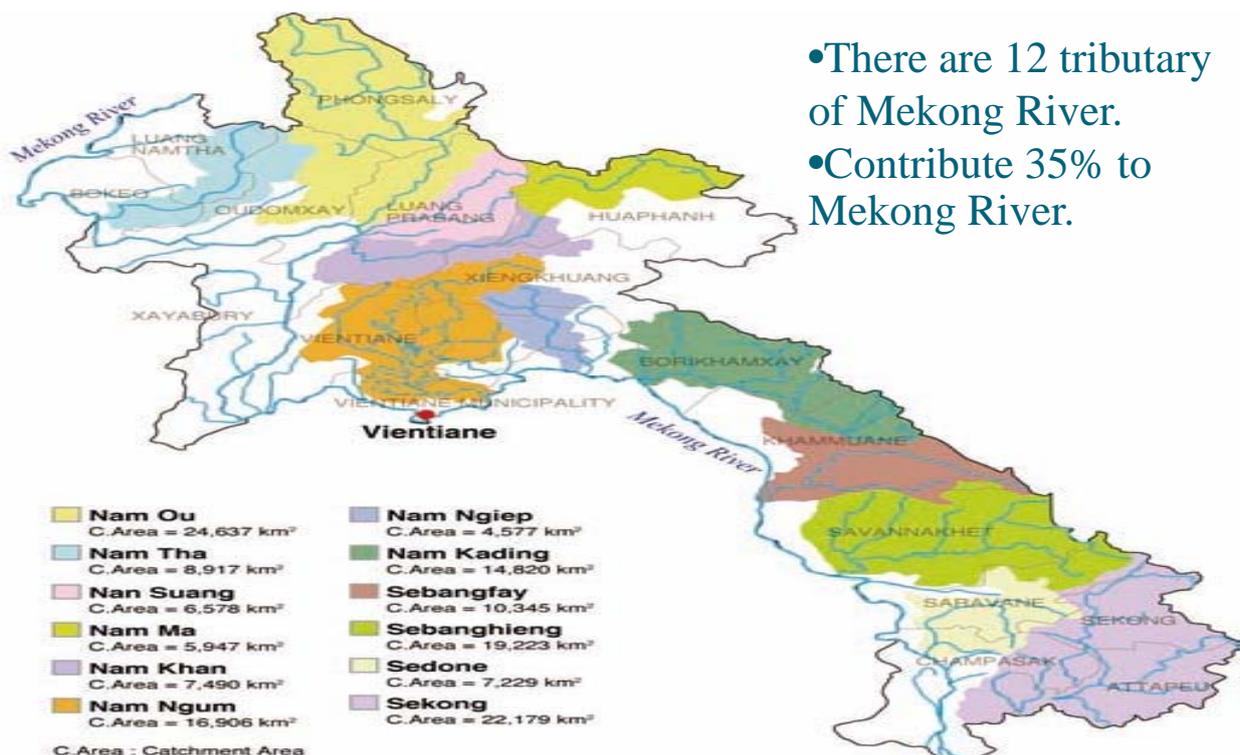
(sources: MOIC, 2013)

Background

- Industrial waste is the most common source of water pollution in the present day and it increases yearly due to the fact that industries are increasing because Lao PDR is *getting industrialized*.
- Industrial wastewater originates from the wet nature of industries which require *large quantities of water from processing and disposal of wastes*.
- Most industries are therefore, located *near water sources*.
- Wastewater from industries includes *employees' sanitary waste, process wastes from manufacturing*, wash waters and relatively uncontaminated water from heating and cooling operations.
- Generated wastewater management from major industries in clued:
 - *Wastewater from production processes,*
 - *Wastewater from cleaning trucks, and machinery*
 - *Domestic wastewater from toilets and*
 - *Rainwater*

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State of Water Resources



- There are 12 tributary of Mekong River.
- Contribute 35% to Mekong River.

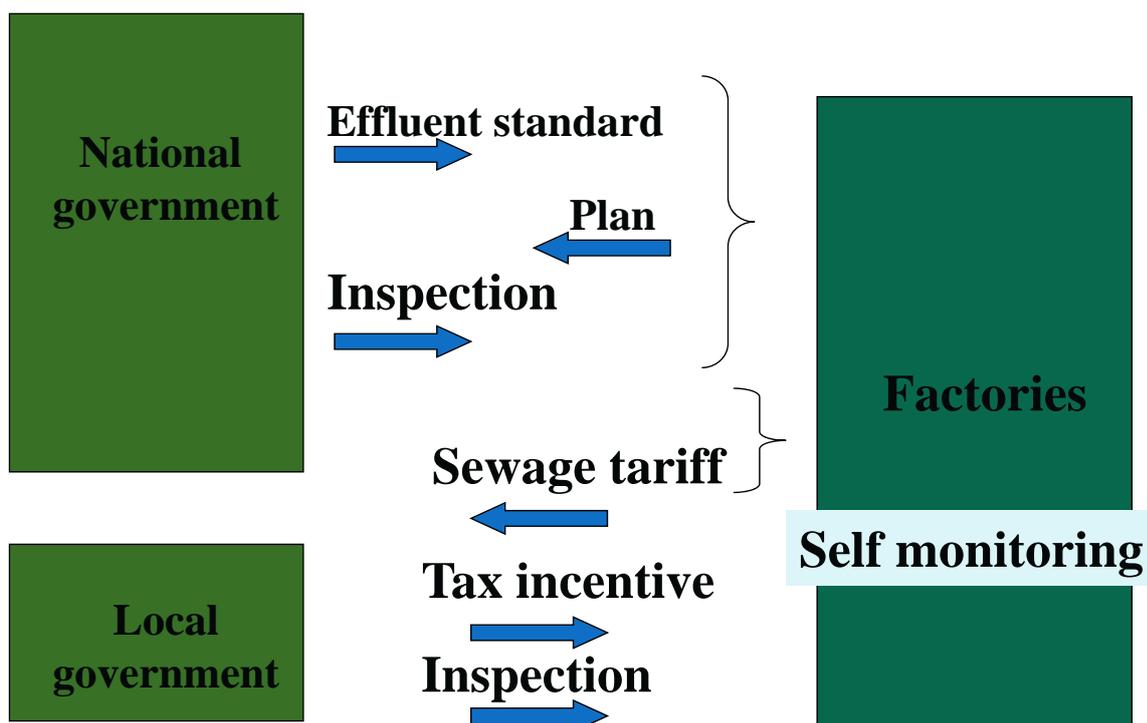
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Inventories of industrial wastewater

- Currently, Lao PDR is setting the National system for data collection and situation of data accumulation in sector of industrial wastewater.
- **Large Factories:** Specified facilities with a volume of effluent more than 10,000 m³/day must have pollution control managers who are qualified by the relevant law.
- **SMEs:** Reporting and guidance by local environmental authorities Subject to monitoring and inspection by provincial authorities (Environmental Unit and Industrial sector).
- **Relocation to industrial parks with collective treatment systems.**

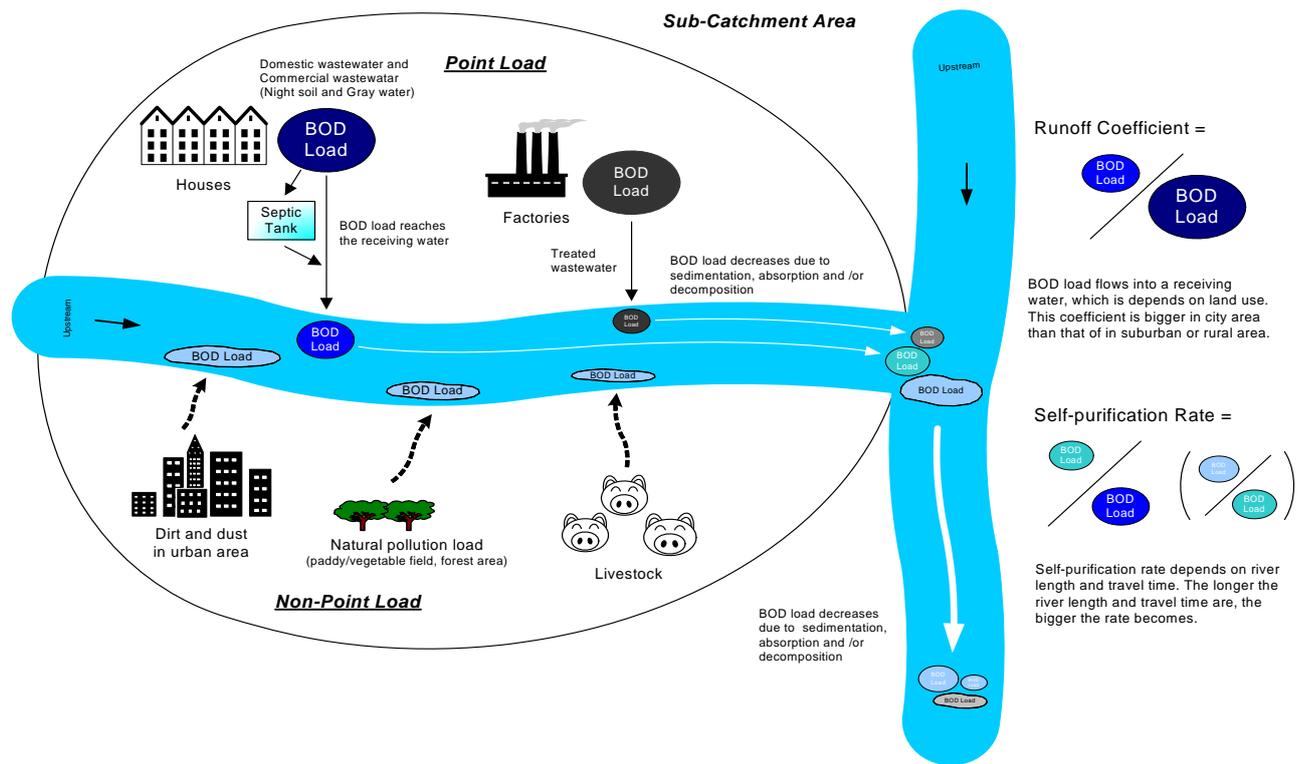
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Industrial Response



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Wastewater Discharge system in Lao PDR



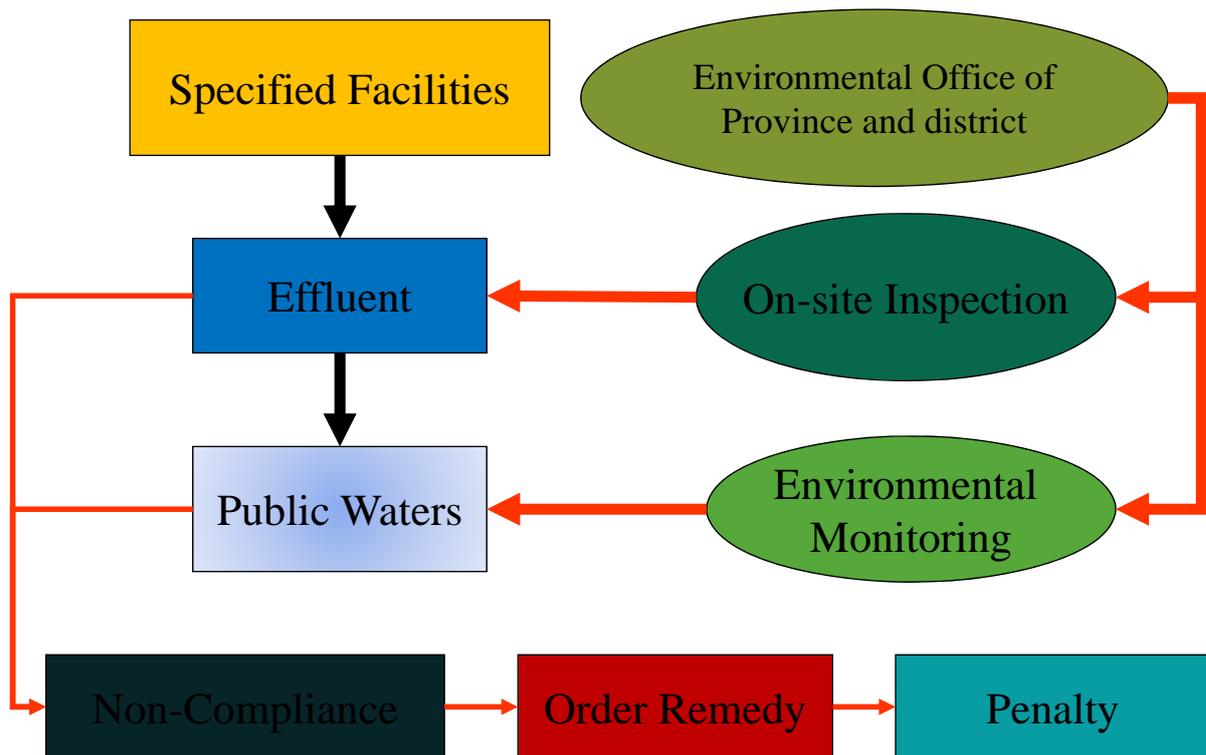
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Strategy Approach for Industrial Wastewater management

- Basic Policy formulated by National Government
- Decentralized enforcement system operated by Local authorities
- Technical expertise accumulated in province and district
- Environmental Research and Monitoring Centers
- Automated monitoring
- Financial assistance to SMEs
- Tax incentives
- Public investment in industrial Park

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Lao PDR Approach Inspection and Monitoring



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Challenges and obstacles

- Inadequate legal framework and unclear institutional responsibilities.
- Wastewater from industrial/factories operations are discharged directly to natural environment.
- Lack of access and monitoring of wastewater services (Laboratory for waster quality analysis).
- Lack of awareness among local authorities on the benefits of improved wastewater.
- Lack of capacity among public institutions in waster environment management.
- Lack of information sharing.

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Conclusion and Recommendation

- Formulate the model of industrial wastewater management system within clear mandate and responsibility of both national and local authorities.
- Formulate a basic plan for the integrated development of industry at national level, and conceptual design for an industrial park is needed in main cities such as Vientiane capital, Savanaket and Pakse province.
- Technical expertise assistant for local authorities.
- Setup the Environmental Research and Monitoring Centers in regional (three part).
- Setup the laboratory for wastewater analysis in central and regional.
- Automated monitoring .
- Formulate the collection, inventory and database management system.
- Information sharing system.

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Thank You for Your Attention

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