



Activity Report of WEPA 2nd Phase (focusing on accumulated knowledge)

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Water Environmental Partnership in Asia (WEPA)

Recognizing that the **improvement of water environmental governance** is essential to solve water pollution problems in Asian region, the Water Environmental Partnership in Asia (WEPA) was launched in 2004 by the ministry of the Environment, Japan. WEPA conducts its activity on a 5-year cycle and the second phase stated in April 2009

WEPA consists of partners in **13** Asian countries

1. Democratic Socialist Republic of Sri Lanka (Sri Lanka)
2. Federal Democratic Republic of Nepal (Nepal)
3. Japan (Japan)
4. Kingdom of Cambodia (Cambodia)
5. Kingdom of Thailand (Thailand)
6. Lao People's Democratic Republic (Lao PDR)
7. Malaysia (Malaysia)
8. People's Republic of China (China)
9. Republic of Indonesia (Indonesia)
10. Republic of Korea (Republic of Korea)
11. Republic of the Philippines (Philippines)
12. Socialist Republic of Viet Nam (Viet Nam)
13. Union of Myanmar (Myanmar)



Purpose of WEPA

1st Phase of WEPA :

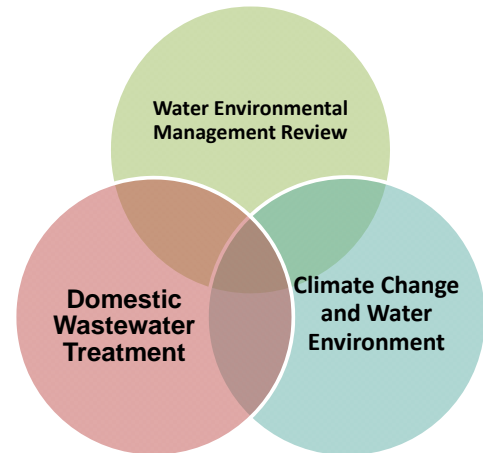
Development of Information Platform of
Water Environmental Management



WEPA database www.wepa-db.net

2nd Phase of WEPA :

Knowledge Sharing for Solution Finding



Identified Issue for 2nd Phase

Basics of 2nd Phase of WEPA

1. Project Duration: April 2009 – March 2014

2. Partner countries: 13 countries (Cambodia, China, Lao PDR, Indonesia, Republic of Korea, Malaysia, Myanmar, **Nepal***, Philippines, **Sri Lanka***, Thailand, Viet Nam, Japan)

*** new partners since 2nd Phase**

3. Main Activities:

- (1) Literature Review/Survey (Questionnaire, Interview)
- (2) Bilateral Meeting, International Workshop, Thematic Workshop
- (3) Publication/Inputs to the International Discussion

Organization of International Workshop and Bilateral Meeting

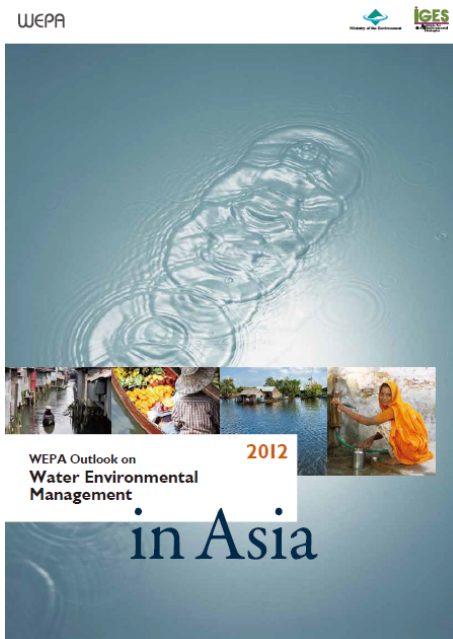


**International Workshop
(at Cambodia in 2013)**

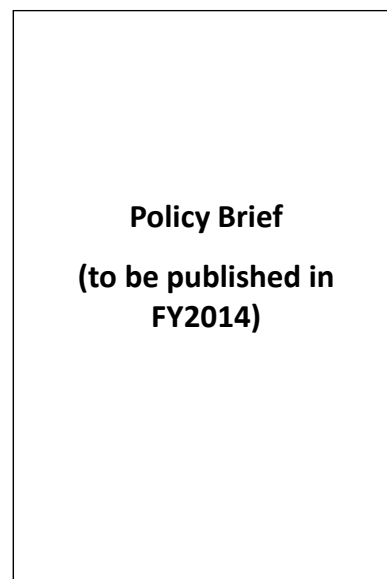


**Bilateral Meeting
(at Nepal in 2010)**

Publications



WEPA Outlook



Policy Brief

Accumulated Knowledge in 2nd phase of WEPA

Topics

- 1) Water Environmental Management Framework in Asia
- 2) Climate Change and Water Environment
- 3) Domestic Wastewater Treatment
- 4) Industrial Wastewater Management

Knowledge 1

Outline of Water Environmental Management Framework in Asia

Review Points of Water Environmental Management in WEPA

1) Legislation, policies and strategies for water environmental management

- Objectives of water environmental management, ambient water quality standards as the administrative target, strategies or plans for water environment

2) Measures to ensure implementation and compliance

- Effluent standards, inspections and penalties for non-compliance

3) Monitoring of ambient and effluent water

- Ambient water quality monitoring, Effluent quality monitoring, Recording, maintenance and evaluation of monitoring results

4) Other factors contributing to enforcement and removal of incorrect practices

- Disclosure of ambient water quality monitoring results, review cycle of water environmental policy

Establishment of Water Environmental Standard in WEPA Countries

| | Ambient water quality standards | | | Note |
|-------------------|---------------------------------|-----------------|-------------------------------|---|
| | For surface water* | For groundwater | For marine and coastal waters | |
| Cambodia | | | | |
| China | | | | There are additional parameters for surface water serving as drinking water sources. |
| Indonesia | | | | |
| Japan | ^{*1} | | ^{*1} | ^{*1} A parameter for the aquatic ecosystem conservation is included under the living environmental standard. |
| Republic of Korea | ^{*2} | ^{*3} | | ^{*2} Water quality by grade & biological features of aquatic ecosystem. ^{*3} Groundwater standards are set for agricultural water, industrial water. |
| Lao PDR | | | | |
| Malaysia | | | | |
| Myanmar | | | | |
| Nepal | | | | Nepal sets water quality standards for different water use objectives. Standards for recreation and those for aquatic ecosystems were established. |
| Philippines | | | | There are two types of standards for surface water-standards for toxins and other conventional parameters. |
| Sri Lanka | | | | Awaiting for approval of ambient water quality standards. |
| Thailand | | | | |
| Viet Nam | | | | |

Legend:

- Human health
- Living environment
- Ecosystem/Biodiversity
- One type
- Others

* Rivers and lakes and reservoirs

Implementation of Ambient Water Quality Monitoring and Disclosure of the result

Implementation of Ambient Water Quality Monitoring

- Ambient water quality is monitored on a project basis or for a specific benefit (e.g., irrigation and drinking water) such in Nepal, Myanmar and Sri Lanka. Other countries have regular monitoring systems which differ in number of monitoring points, parameters, and frequency.

Disclosure of the result

- In many countries the state of water quality is mainly reported to the general public via annually published environmental quality reports. The following countries enable public access to environmental reports giving comprehensive assessments of water quality on websites: China, Japan, Republic of Korea, Malaysia, Thailand, and Viet Nam.

Establishment of Effluent Standard in WEPA Countries

| Country | Industry | Domestic | Remarks |
|------------|----------|----------|---|
| Cambodia | ○ | ○ | For 67 pollution source |
| China | ○ | ○ | Domestic: for urban wastewater treatment facility |
| Indonesia | ○ | ○ | |
| Japan | ○ | ○ | |
| Korea | ○ | ○ | |
| Lao PDR | ○ | ○ | Domestic: For urban area |
| Malaysia | ○ | ○ | |
| Myanmar | - | - | Yangon has effluent standard. National government starts discussion for establishment national standard |
| Nepal | ○ | | Domestic: unknown |
| Philippine | ○ | ○ | Domestic: municipal wastewater |
| Sri Lanka | ○ | ○ | |
| Thailand | ○ | ○ | |
| Vietnam | ○ | ○ | |

MOEJ-IGES "WEPA Outlook on Water Environmental Management in Asia" (2012)

Situation of Effluent Quality Monitoring in WEPA Countries

Situation of Effluent Quality Monitoring

- Despite obligations on the owner of the pollution source and wastewater treatment facility to monitor effluent quality, this is not comprehensively done in all countries and monitoring results sometimes do not reach the intended authorities.

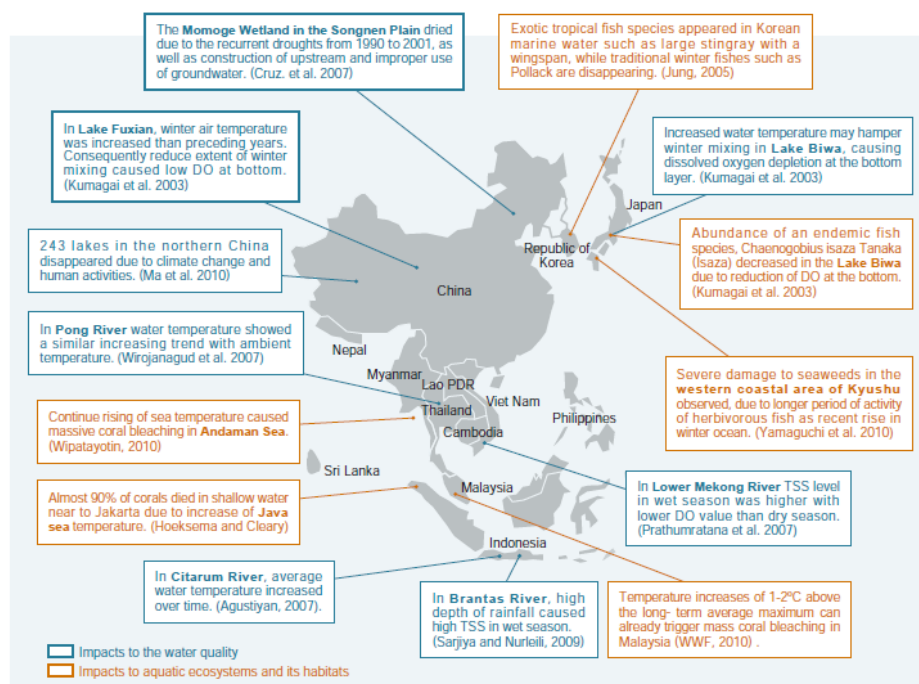
Knowledge 2

Climate Change and Water Environment in Asia

Review points for climate change and water environment

- Impact of climate change on water quality and aquatic ecosystem in WEPA countries
- Policy Response: Adaptation policies/strategies of WEPA partner countries
- Investigation on potential impact of climate change: potential for climate change impact study to lead to development of policies for the water environment

Changes in the water environment attributed to climate change



Facts identified through review

Adaptation policies/strategies

- Water storage and natural ecosystems are often addressed in national climate change adaptation policies/strategies
- However, water quality aspect is not often mentioned in the policies/strategies.

Potential for climate change impact study

- Sufficient data for water temperature and water quality have NOT been collected in many WEPA partner countries to allow a view of the trends and correlations in changes in water temperature and water quality.
- In addition, perception survey to local people (e.g. fishermen) is one way to gain empirical knowledge of potential impacts.

Lessons identified in WEPA's review

- Strengthening and improvement of current water quality management as an important adaptation action
- Utilization of local experience and knowledge

Knowledge 3

Domestic Wastewater Treatment in Asia

WEPA's approach for issues on domestic wastewater treatment

- To accumulate and share the knowledge of **current situation and issue** on domestic wastewater treatment in Asia
- To share **“Good Practices”**
- **Policy Framework** as well as technology

Past Activities in Domestic Wastewater Treatment

FY2009

Workshop in Hanoi

- Current situation and issues on domestic wastewater treatment in capital city were shared

FY2010

Questionnaire Survey

- Review of national policy for domestic wastewater treatment
- Hot spot identification
- Collection of good practices on domestic wastewater management (mainly project-level)

FY2011

Workshop in Manila

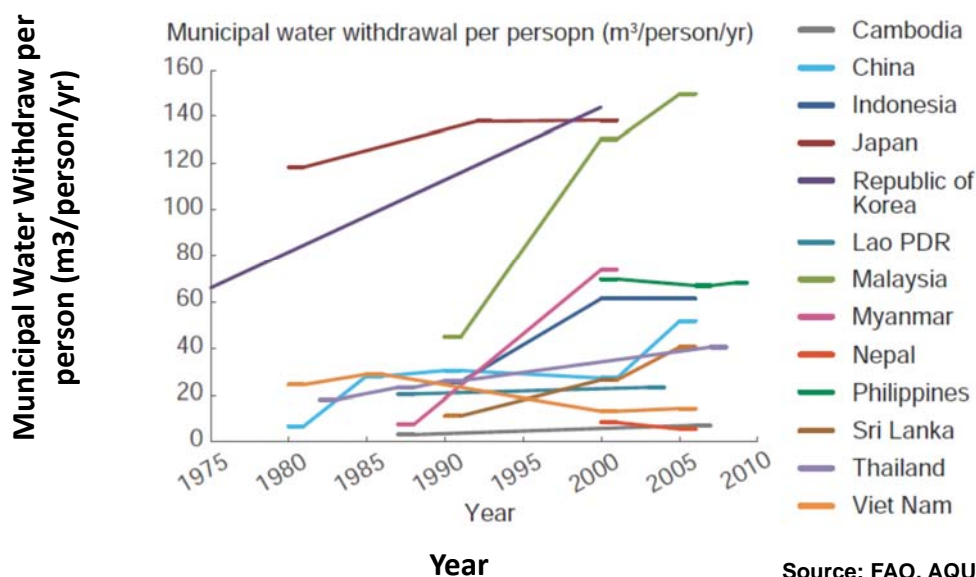
- Good practices (Strategic/programmatic level of experience) on domestic wastewater treatment were shared at Workshop in Manila

FY2012

Workshop in Siem Reap

- Good practices of Decentralized Domestic Wastewater Treatment in Asia were shared at Workshop in Siem Reap.

Change of Domestic Water Use in Asia



Source: FAO, AQUASTAT

Change of water withdrawal per person for domestic purpose

Centralized Treatment Facility in WEPA Countries



Beijing
(1 million m³/day :
Activated Sludge)



Kathmandu
(16 thousands m³/day:
Oxidation Ditch)



Urumqi
(10 thousands m³/day:
Oxidation Ditch)



Jakarta
(45 thousands m³/day:
Oxidation Pond)

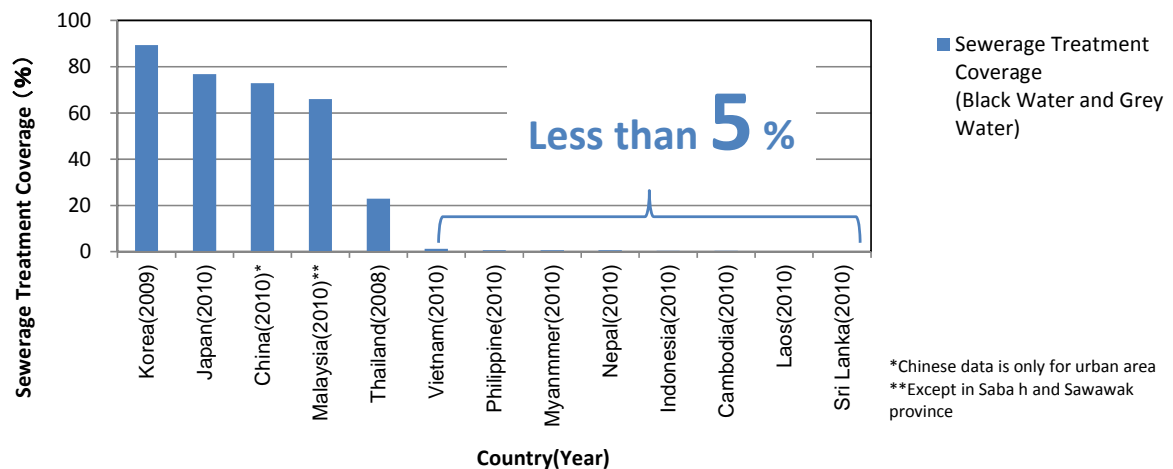


Suphan Buri
(11 thousands m³/day:
Stabilization pond)



HCMC
(30 thousands m³/day:
Oxidation Pond)

Centralized Treatment Coverage in Asian Countries

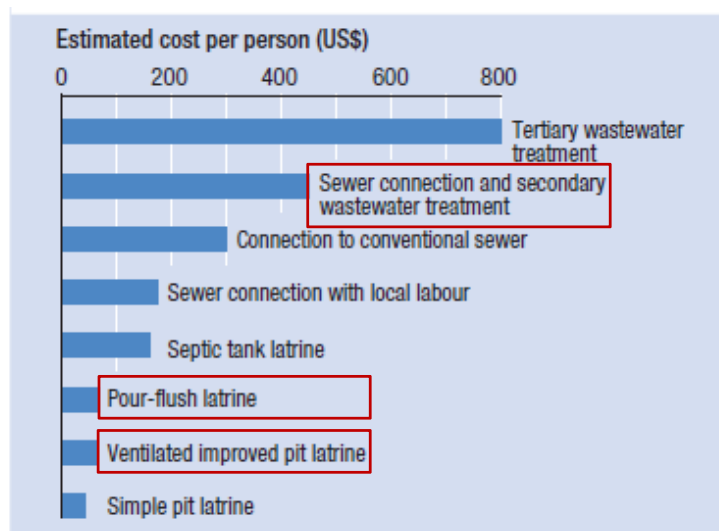


Service coverage ratio of sewerage treatment in selected Asian countries

Septic Tank Coverage Population in selected WEPA Countries

| | |
|--------------------------|-----|
| Malaysia (2010) | 20% |
| Vietnam (2008) | 41% |
| Indonesia (2012) | 53% |
| Cambodia (2008) | 43% |
| Manila/Philippine (2010) | 71% |

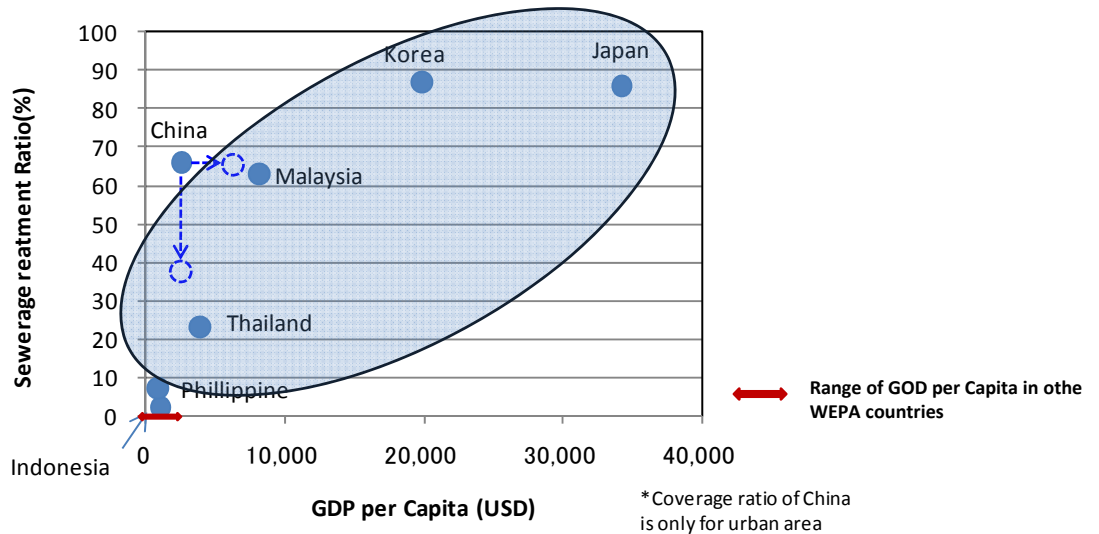
Challenge in Centralized Approach



Source : Human Development Report 2006, UNDP

Cost of different domestic wastewater treatment methods

Challenges in Centralized Approach



Relationship between sewerage treatment ratio and GDP per capita in selected Asian countries as of 2010(except for Korea (2009) and Thailand(2008))

Possibility of Decentralized Approach as Alternative of Centralized Treatment

Decentralized Approach

Centralized Treatment

Wastewater collection and treatment system for more than two communities (sewerage treatment plant)



Cluster Treatment

Wastewater collection and treatment system for two or more households but less than an entire community (such as community based treatment plant)



On-site Treatment

Treatment system to collect, treat and discharge domestic wastewater from individual households without the use of community-wide sewers (such as septic tank, Johkasou)



Responsible Entity for Construction and Operation

| | |
|--|--|
| Local Government | [Example] <ul style="list-style-type: none"> Construction and operation of decentralized domestic wastewater treatment in China Construction and operation of cluster domestic wastewater treatment in Thailand |
| Private company/ developer | [Examples] <ul style="list-style-type: none"> Construction and operation of small scale domestic wastewater treatment facility in Malaysia (Developer/IWK) Construction and operation of small scale domestic wastewater treatment facility in Manila (Manila Water and Manilad) |
| Community | [Examples] <ul style="list-style-type: none"> Construction and operation community based domestic wastewater treatment plant in Indonesia(SANIMAS) |
| Individual person (house owner) | [Examples] <ul style="list-style-type: none"> Installation and operation of on-site domestic wastewater treatment (Johkasou) in Japan Installation and operation of septic tank in Thailand and Manila |

Focus Points

| | |
|---|--|
| Technology | <ul style="list-style-type: none"> Targeted wastewater (Black/Grey) Methodology for collection and treatment Removal rate/Effluent water quality Cost for construction and operation/maintenance Methodology of sludge treatment/disposal |
| Management Framework (Obligation/Responsibility) | <ul style="list-style-type: none"> Responsible body (Who has responsibility for construction and operation?) Obligation and responsibility in legal framework |
| Management Framework (Governmental Support) | <ul style="list-style-type: none"> Subsidy system Technological guideline Other support |
| Management Framework (Operation and Monitoring) | <ul style="list-style-type: none"> Methodology of operation and maintenance Charging system Monitoring and reporting |

Lessons learned on domestic wastewater treatment

- Appropriate technology should be decided considering **natural and socio-economical condition and level of development, etc.** at the site.
- In order to encourage proper installation and operation, regulations alone are not sufficient. **Governmental support** in the respect of **technological standardization, financing, outsourcing and education** is needed.
- **Proper Operation and Maintenance** including **Charging and Periodical Monitoring** is required for sustainable management of domestic Wastewater treatment system.

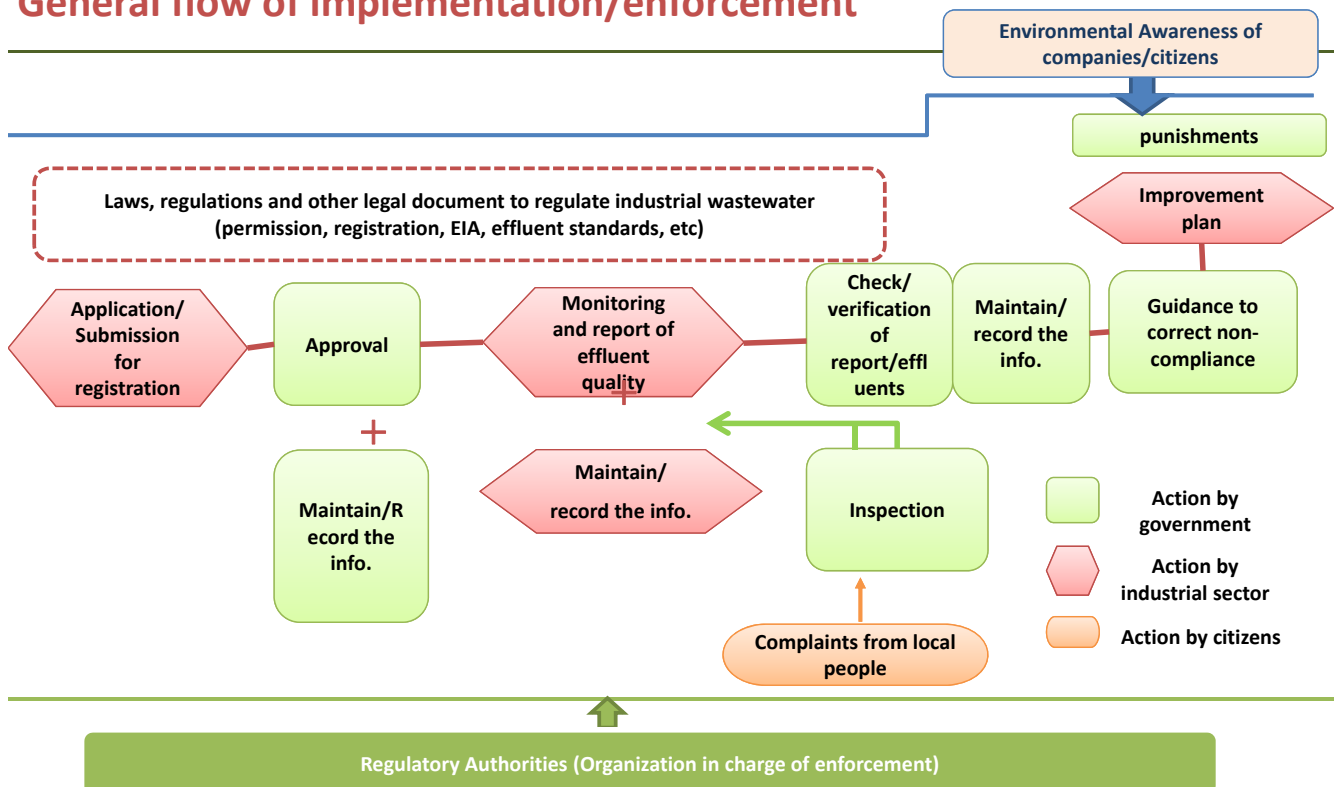
Knowledge 4

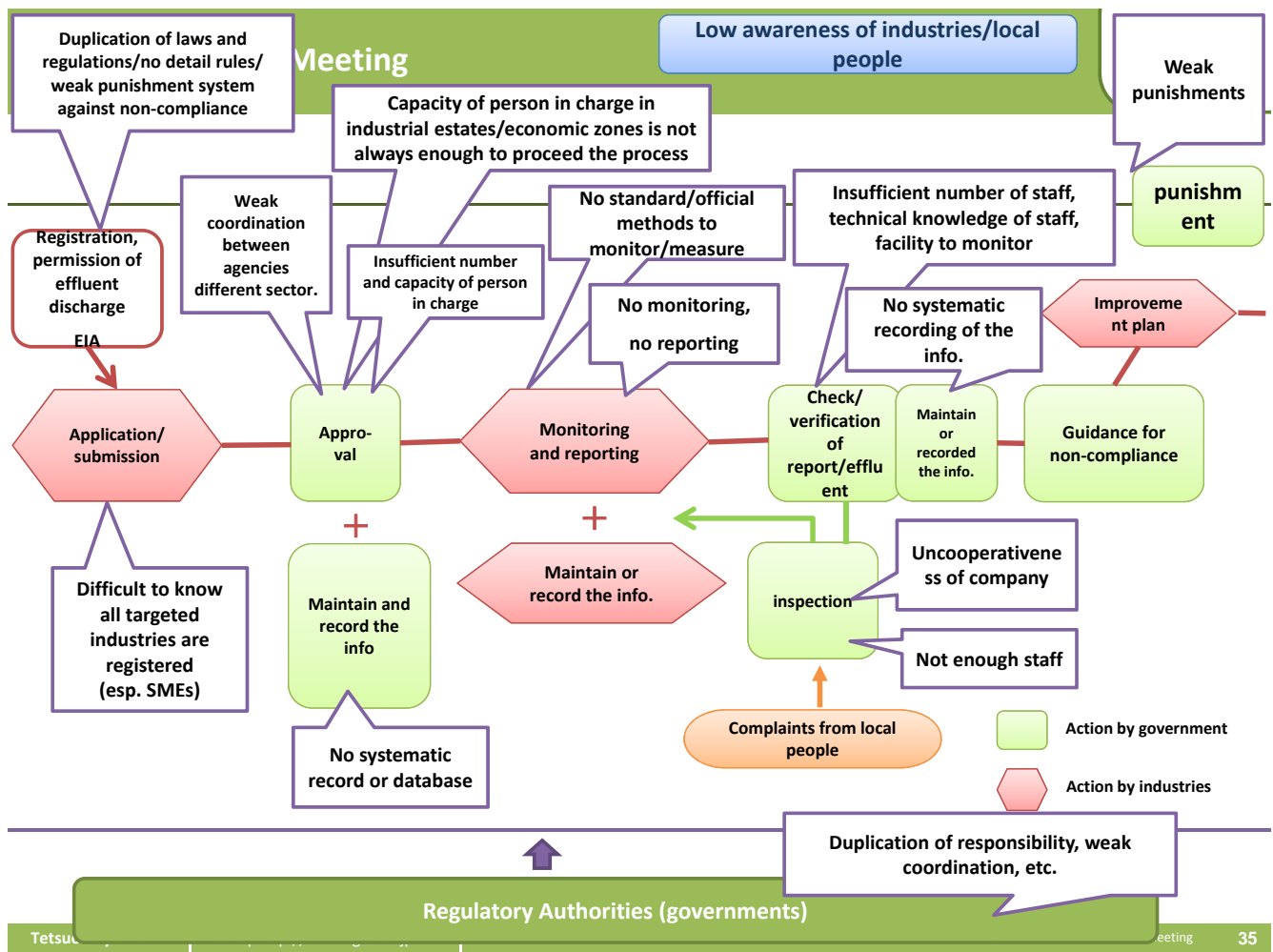
Industrial Wastewater Management in Asia

WEPA's activity on industrial wastewater management in FY 2012

- The survey aiming to identify **current framework, practices and implementation challenges** of industrial wastewater management in WEPA countries.

General flow of implementation/enforcement





Summary of identified common gap of industrial wastewater management

Capacity gap

Lack of staff capacity of staff, equipment, and knowledge to implement legal procedure

Information gap

- a. Not enough baseline information for promoting enforcement
- b. Hugging of the data (no or less info. sharing mechanisms)
- c. Doubts on “reliability” of data

Institutional gap

Weak coordination

Overall Summary

- **Basic water environmental management framework** such as legal system, policy and strategies has already been developed in most WEPA countries. However, **level of its implementation and enforcement** is different in different countries. Especially, many countries face implementation and enforcement of **wastewater management** framework.
- **Appropriate wastewater management system (technology and framework)** should be decided **considering natural and socio-economical condition and level of development**, etc. at the site.

Thank you for your listening