

The top banner features the WEPA logo on the left, with the text 'Water Environment Partnership in Asia' below it. The background of the banner is a blue-toned image of water ripples on the left, transitioning to a landscape with a body of water and trees on the right.

WEPA

Water Environment Partnership in Asia

SUMMARY OF DISCUSSION FROM DAY 1

Pham Ngoc Bao, Ph.D

WEPA Secretariat

Institute for Global Environmental Strategies (IGES)

WEPA International Workshop on Industrial Wastewater Management

Purpose:

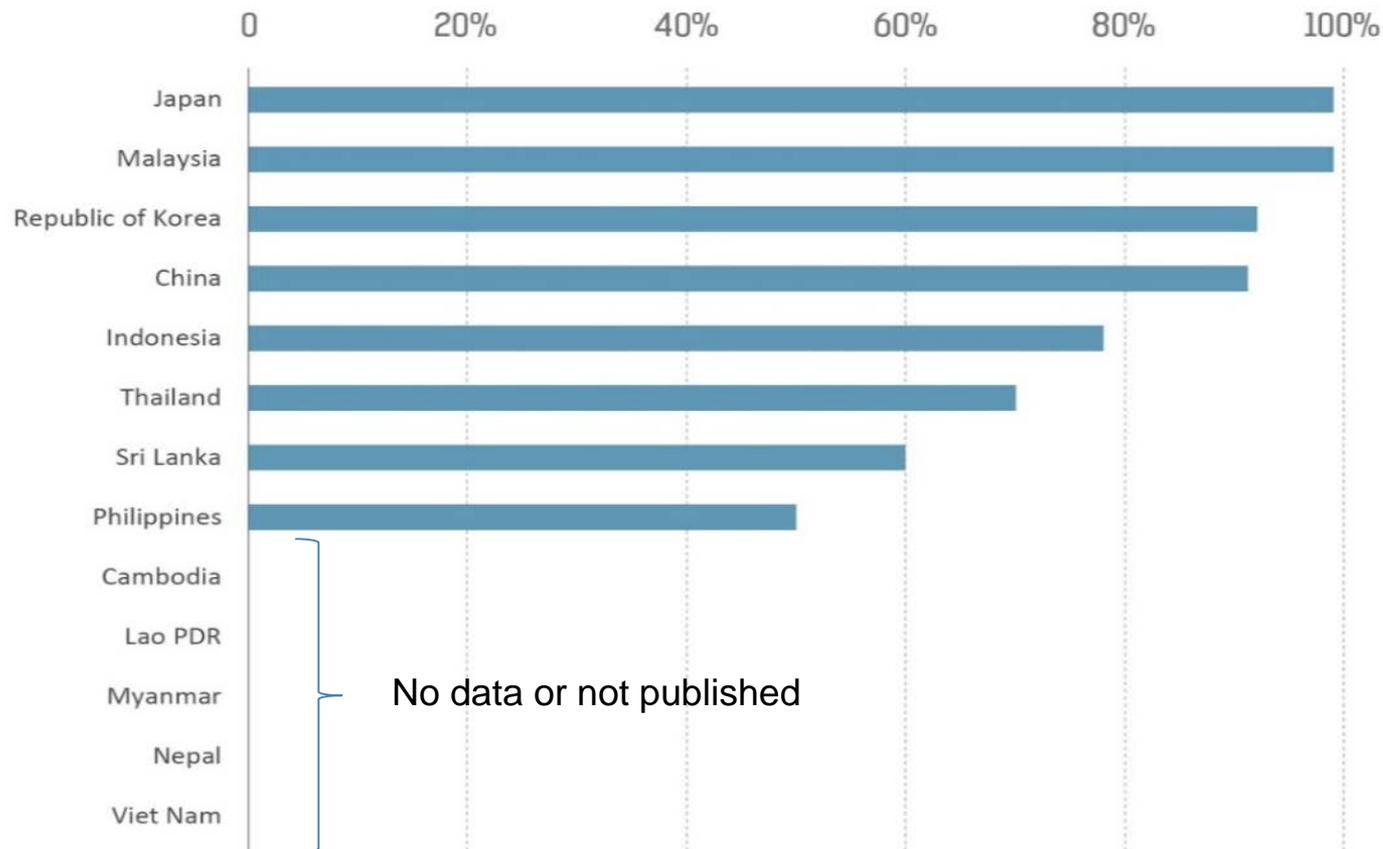
To discuss necessary measures to improve water environment conservation in the WEPA partner countries

- Pollution load control
- Wastewater quality control
- Wastewater treatment technologies

Compliance rate of industrial effluent standards

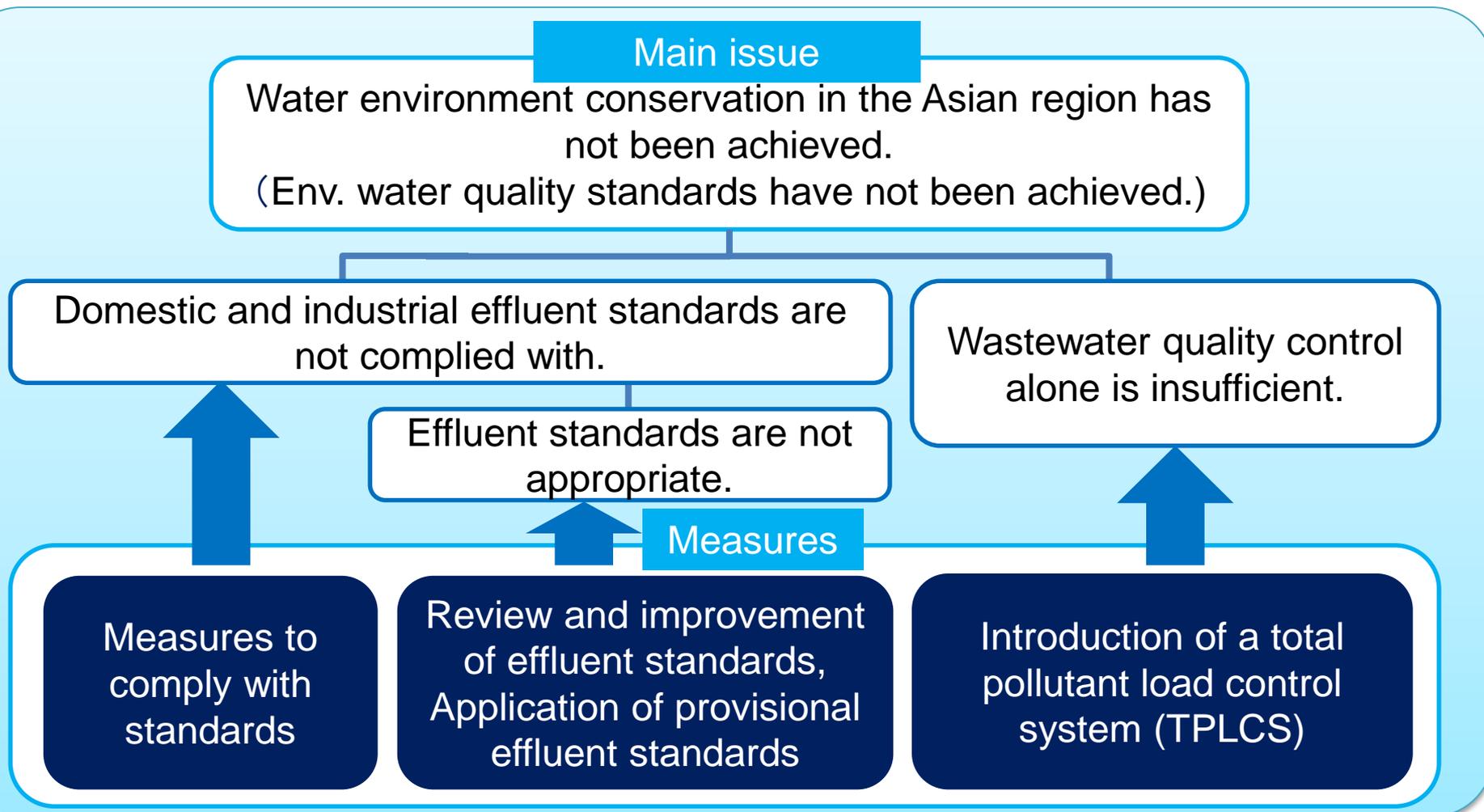
- There are big differences in the compliance rates between WEPA partner countries.
- In many countries, the compliance rate of industrial effluent standards is not high, and the compliance rate is not accurately recognized by government agencies.

Compliance rate of industrial effluent standards



(source: WEPA Outlook 2018, pp.28-29)

Issues and measures based on efforts up to the 3rd Phase



History of Water Quality Protection in Japan

■ Events after the foundation of the Environment Agency (1971)

- 1973 Establishment of Law Concerning Provisional Measures for Conservation of the Environment of the Seto Island Sea
- 1978 Establishment of Law Concerning Special Measures for Conservation of the Environment of the Seto Island Sea/ amendment of the Water Pollution Control Act
- 1979 Initiation of total pollutant load control in Tokyo Bay, Ise Bay, and Seto Island Sea**
- 1984 Establishment of Law Concerning Special Measures for Conservation of Lake Water Quality (Clean Lake Law)
- 1989 Amendment of the Water Pollution Control Act (Groundwater contamination)
- 1990 Amendment of the Water Pollution Control Act (Household wastewater)
- 1993 Establishment of Basic Environment Act
- 1994 Establishment of two laws concerning drinking water sources
- 1999 Establishment of Law Concerning Special Measures against Dioxins
- 2001 Foundation of MOEJ
- 2001 Initiation of the fifth total pollutant load control, including nitrogen and phosphorus
- 2003 Establishment of the Environmental quality standard for Water Pollution, with focus on conserving aquatic organisms
- 2005 Amendment of the Clean Lake Law (establishing areas for effluent control, preserved areas around lake and reservoirs)
- 2010 Amendment of the Water Pollution Control Act (reinforcing punishments for not recording measurements, and/or false reporting)**
- 2013 Amendment of the Water Pollution Control Act (omitting provisions which exclude radioactive substances as target pollutants)

Effluent Regulations under the Water Pollution Act

- Prof. Hosomi explained how Water Pollution Control Act works?
- Target facilities of effluent control: specified facilities (e.g. steel industries, livestock industries) and specified factories (that use and treat hazardous substances)
- Regulatory standard items: (i) living environment items that damage to the living environment (e.g. BOD, COD, nitrogen, etc.) and (ii) health items, which damage human health (e.g. cadmium, arsenic, etc.)
- Uniform effluent standards for living environment and health items have been established for specified factories. These factories must comply with uniform effluent standards at any time.
- Meanwhile, Prefecture governments can (i) set more stringent effluent standard; (ii) are authorized to conduct on-site inspections into specified factories; (iii) can issues an improvement order for the structure of specified facilities; (iv) and command to suspend the operation of the specified facilities.

Effluent Regulations under the Water Pollution Act

- Prof. Hosomi showed an example of success story from provisional standard to uniform standard (wastewater from natural gas upstream industry; ammonia removal from waste brine).

In conclusion, he emphasised that:

- ✓ Setting environmental standards for protecting human health
- ✓ Followed by setting effluent standards to achieve those environmental standards
- ✓ Ensuring compliance with those standards
- ✓ Monitoring water bodies to confirm their effects

Industrial Wastewater Management in Thailand



<https://workpermit.co.th/blog/6-technologies-that-will-disrupt-the-petrochemical-industry/>



<https://www.fibre2fashion.com/industry-article/5513/textile-effluent-treatment-an-ecofriendly-approach>



1. High Risk Industry Group

Frequent accident such as petrochemical industry, ethanol industry, sugar industry and cold storage industry.

2. High Pollution Industry Group

Has difficulty comply with effluent standard such as starch industry, textile Pulp and paper industry and leather tanning industry.

3. Low Capacity for Environmental Management Group

Discharge wastewater without treatment such as small industry (SME) and community factory

- Dominated by SME and communities factories, both in term of number/percentile of factories and labor size
- Pollutant loadings have been increased from year to year due to increasing number of industries.
- Main pollution sources are from domestic and industrial sector
- As a result, only 9 river (among 59 rivers and reservoirs) meet Surface Water Quality Standard.
- Challenges: including lack of officers for factory inspections (only 3 inspectors per province); accredited laboratory availability; collaborative monitoring mechanism; insufficient monitoring tools/equipment; lack of data exchange mechanism among governmental agencies and lack of environmental awareness/ethics among factory owners.

Mitigation Measures



Green Industry

Improvement and focus on social responsibility which supports sustainable development policy.

Permit system

Pollution sources must register for discharging permit.



Control measure for small and community industry

Using Best Practical Control Technology (BPT) or specific eff. Std. for this kind of industry.



Eff. Std. Improvement

Development of industry-specific effluent control std. such slaughter industry, power plant etc.



Authorized Third Party

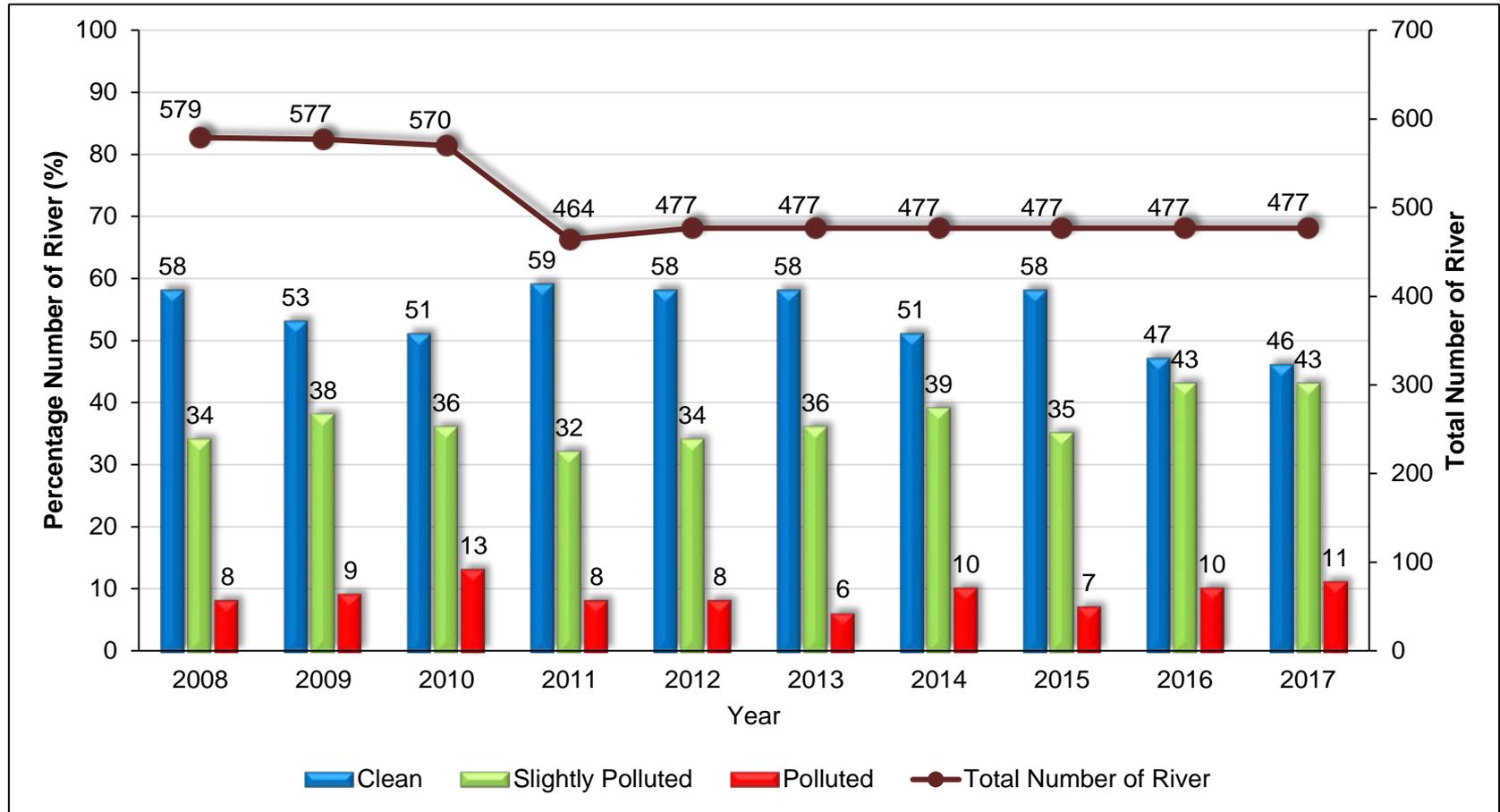
In order to reduce the gap of lacking officers to monitor, Authorized Third Party will support this duty.



Community Network

Monitoring industry surrounding by community network via application or other communication process.

Total Maximum Daily Load (TMDL): The Malaysia



The percentage of clean river nationwide dropped from 58% in 2008 to 46% in 2017

Why TMDL in Malaysia?

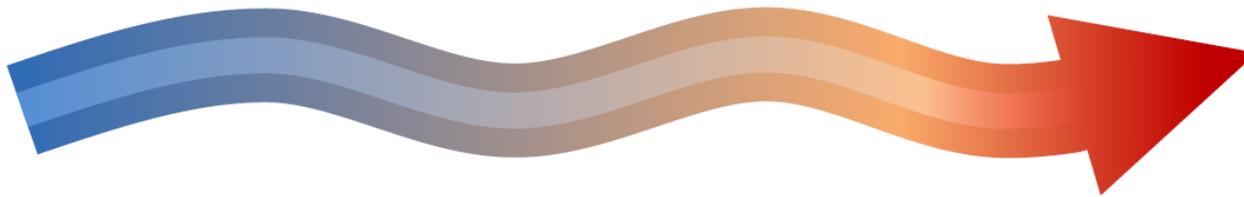
1. River basins have undergone intensive **development**: agriculture, urbanisation and industrialisation

3. Regulation has focused on **individual** pollution sources but not cumulative impacts

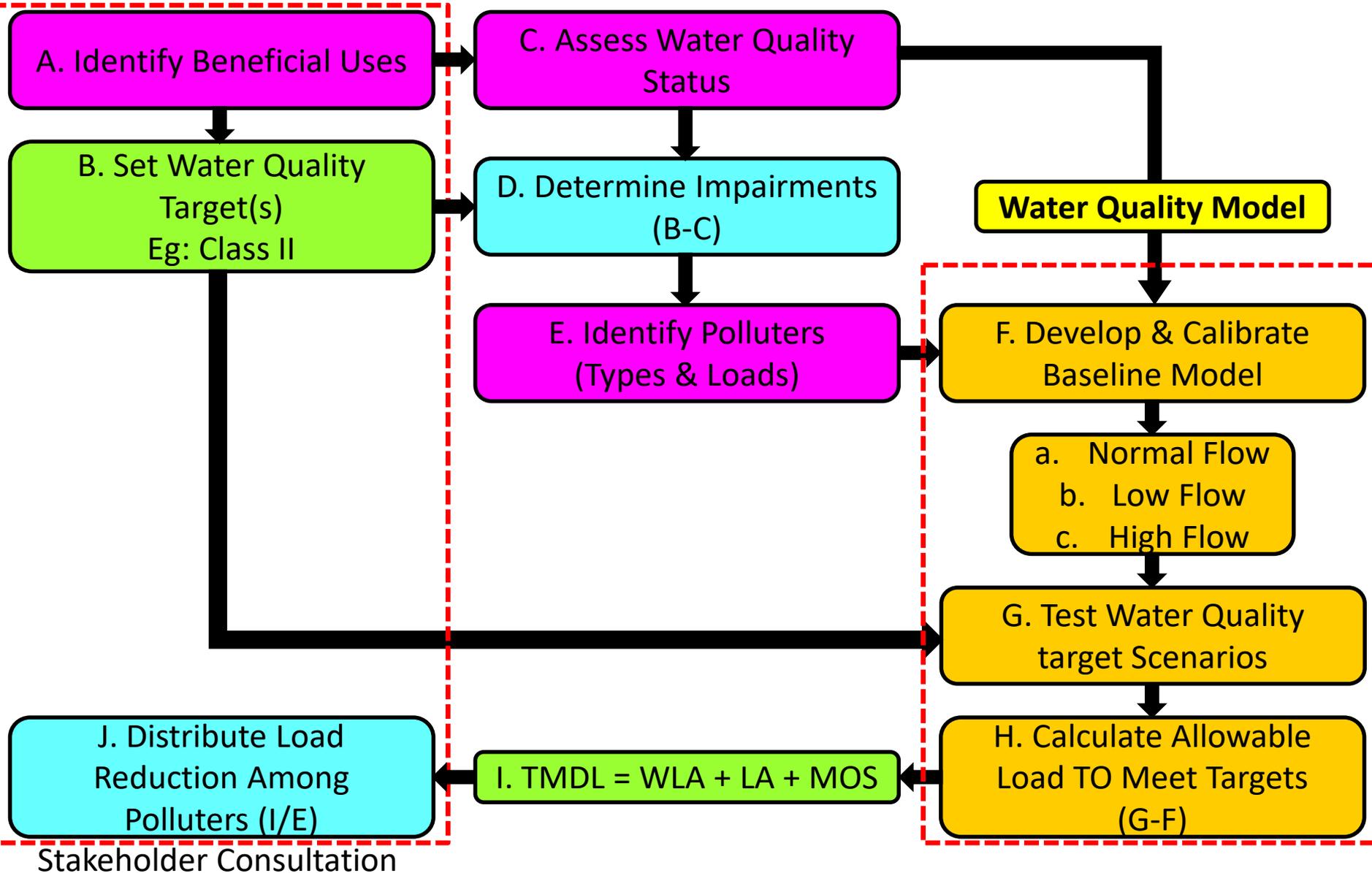
5. Present regulatory controls have reached limits; will not be able to improve river water quality

2. Pollution sources/loads have **increased**, impacting the assimilative capacity of rivers

4. Compliance have improved, however DOE does regulate most **non-point source** and many point source polluters



THE TMDL PROCESS – 9 STEPS



Challenges for implementing TMDLs (Malaysia & Korea)

1. Lack of sufficient data to characterize the watershed and pollutant sources through modelling and/ or monitoring activities (Malaysia)
2. Lack of monitoring data to reflect water quality improvement (Malaysia)
3. Lack of communication and coordination between local governments and responsible agencies (Malaysia)
4. Lack of commitment/supports from stakeholders and local governments (both Malaysia and Korea)
5. Lack of funding (Malaysia)
6. Infrastructure with older technology – not efficient (Malaysia)

The Way Forward

- Setting water quality targets
- Prescription of WLAs and LA are done right away for new/upcoming developments
- Inter-agency cooperation and coordination between federal and state level
- Water quality standards
- Setting the mechanism
- Development of TMDL implementation strategies

Recent efforts in industrial wastewater regulation in Korea

- Framework of water environmental law
 - Environment Policy Framework Act
 - Water Environment Conservation Act (including regulation of wastewater from the effluent)
- Effluent Standards (7 parameters) vs. Permissible Discharge Limit (55 parameters)
 - → Number of parameters have increased from year to year to address emerging pollutants (e.g. EDCs, micro-plastic, etc)
 - Number of industries have increasing.
- Recent efforts in industrial wwm
 - Introduction of TOC to PDL and Effluent Standards (limitation of COD...challenge to measure all organic matters including non-degradable organic substances: COD: 30-60% vs. TOC: 90%). TOC has been a parameter as Water Quality Standards since 2013. Meanwhile, COD was applied for effluent standards and permissible discharge limits. Application of TOC to facilities
 - Eco-toxicity: Limitation of current parameters. Toxicity test of wastewater (effluent)
 - Monitoring the amount of emission of hazardous pollutants at targeted facilities
- Future plan
 - 2nd Framework of Water Environment Management
 - Improving the more reasonable regulation about compounds
 - Improving shortcomings of uniform permit system
 - Taking into account BAT for Permissible Discharge Limit
 - Increasing the various species for ecotoxicity

Recent efforts in industrial wastewater regulation in the Philippines

- A total of more than 1 million business enterprises operating in the countries...more than 99% is micro-SMEs 60% located in Manila. Meanwhile, sources of water pollution are mainly from domestic (33%); industrial (27%); agri. and livestock (29%) and non-point sources (11%)
- WW is pre-treated by industries (centralized wastewater treatment facilities) before discharging into sewerage systems of industrial park. Industries not located within an industrial park, effluent must comply with the Philippines Effluent Standard, DAO 2016-08.
- Challenges to remove nutrients from industrial wastewater
- Industries that are known to generate large amount of wastewater are: food and dairy manufacturing, pulp and paper products and textile products.
- However, data on the volume of generated ww by industries are still very limited. There is no national database systems.
- In Manila Bay Area alone, 5,228 out of 10,168 industries were served with Notices of Violation (NOV) for failure to acquire permits to discharge treated wastewater.

KOBELCO ECO-SOLUTIONS

- A brief introduction about KOBELCO, business areas and activities in Mekong region.
- He emphasized on the need of not only construction of WWTP but also proper operation and maintenance of these facilities.
- Introduction of model project for improvement of water environment in Asia:

Promotion of textile dyeing industrial wastewater treatment in Vietnam

- Objective: to promote the industrialization in the dyeing industry and environmental protection
- Technology applied: UASB, MBBR, etc. and physical-chemical treatment (Oxidation-reduction, coagulation). Main difficulty is to treat color to meet the effluent standards.
- Trend of textile dyeing industry in Vietnam: There are 5,000 textile companies; trading amount account for 8% of GDP and ranked top of export amount.

Discussion Points on Wastewater Quality Control

- What are the main reasons for non-compliance with industrial effluent standards?
 - Need to listen to the industries
 - Need to complete the database;
 - Roles of regular monitoring and inspection systems
 - It is essential to improve/strengthen the enforcement of the laws and strictly employing penalty system;
 - It is important for consider not only concentration-based standard but also total pollution load-based standard to improve water quality
 - Political will is very important

Discussion Points on Pollution Load Control

- What are challenges for introduction and successful implementation of total pollution load control system such as TMDLs?
 - ❑ TMDLs was first introduced in Korea since 2000...but still facing a lot of problems. At first, only BOD and T-P were considered.
 - ❑ Take a lot of time to arrange with local governments
 - ❑ We (the Philippines) consider TMDLS is a promising approach to address the water quality challenges. We need data from non-point sources...For WEPA, we should consider which country is now advancing in this TMDL regulation... We are looking forward to seeing good practices and examples.

Discussion Points on Pollution Load Control

- **How to overcome and start efforts to address these challenges?**
 - ❑ Need to set up water quality guidelines and standard
 - ❑ Technological guidance is important
 - ❑ Beside enforcement from governments, we need improve/raise the awareness (IEC) among local people; we also need continuous monitoring systems...so that we can use accurate data for implementing TMDL and conduct further study for improvement.
 - ❑ Capacity building, improved know-how on efficient and sustainable technologies and technology transfer. Domestic wastewater is our main issue...appropriate technologies is important. Cost-effective technologies should be considered and disseminated
 - ❑ Lacking information on Guidelines, appropriate water quality standards

Thank you for your kind attention!