ASEAN IWRM Country Strategy Guidelines
- IWRM Monitoring Status Guidelines for ASEAN Countries

1. Background

The ASEAN Working Group on Water Resources Management (AWGWRM) has developed an ASEAN Strategic Plan of Action on Water Resources Management with the support from the Australian Government in 2005. To support the implementation of the Plan, ten project concept proposals were formulated and included in the Appendix of the Strategic Plan Report. One of the ten project concepts: Project Concept 2 is on the development of an "ASEAN IWRM Country Strategy Guidelines". DID Malaysia was requested by the AWGWRM to organize and conduct a workshop to develop the details of the "ASEAN IWRM Country Strategy Guidelines".

The workshop participants agreed that the generic ASEAN/IWRM framework will be structured on the following 6 major water management issues in ASEAN:

- Water Supply
- Irrigation
- Stormwater Management
- Floods Management
- Water Pollution Management
- Sanitation Management

Arising from the workshop the following outputs have been prepared for use by ASEAN countries to assist them in preparing and reporting on their respective countries' IWRM action plans and strategies to address the above 6 thematic issues.

(a) A set of specific IWRM goals for the above 6 key water-related issues in the region.
(b) For each set of thematic goals a set of IWRM objectives to achieve the goals have also been identified, categorized under the 3 categories of GWP IWRM tools, i.e. Enabling environment, Institutional environment and Management tools.
(c) Also indicators for measuring the progress in achieving the objectives associated with each of the thematic goals have been developed. They can be used for measuring regional performance and progress towards meeting the IWRM goals for the 6 key water related issues in the region.

2. The ASEAN IWRM Monitoring Status Guidelines

The Workshop participants in Malaysia have agreed to develop monitoring guidelines for six key water management issues that are considered important in ASEAN countries. They are as follows:

(a) Water Supply Management
(b) Irrigation Management
(c) Stormwater Management
(d) Flood Management
(e) Water Pollution Management
(f) Sanitation Management

The following are the monitoring guidelines for the above 6 key water management issues.

IWRM Issue 5 – Water Pollution Management (18 indicators)			
Indicator Types	**Indicators**	**Progress**	**Description**
Outcome Indicators	1. Percentage of monitored water bodies' ambient water quality meeting designated uses (agriculture, water supply, fisheries, industries, etc.)	82% (DO) 70% (BOD)	Based on submissions as of 28 February 2025, the Philippine Statistics Authority reports that **82%** of monitored water bodies in the Philippines met the dissolved oxygen (DO) standards, and about **70%** met the biochemical oxygen demand (BOD) criteria based on the water quality guidelines of the Clean Water Act. Source: https://psa.gov.ph/system/files/phdsd/Goal%206_as%20of%2028%20Feb%202025.pdf
	2. Percentage of industrial/ domestic effluent discharge complying with the country's effluent discharge standard	50%	In 2022, the compliance rate of firms to water quality standards increased to **50%**. This is attributed to the strengthened IEC campaign and virtual trainings resulting in the extensive awareness for both the industries and LGUs on RA 9275 or the Clean Water Act of 2004. Further data are shown below: Discharge Permit issued: 10,108 Monitored Firms: 10,648 Notices of Violations Issued: 5,346 Percentage of Compliance: 50% Source: https://denr.gov.ph/wp-content/uploads/2024/04/DENR-Annual-Report-for-FY2022_.pdf
EE Indicators	1. Any "Policy" on water pollution control	Yes	Water Quality Management Policies - Updated Water Quality Guidelines (WQG) and General Effluent Standard (GES) for Selected Parameters (DAO 2021-19) - Guidelines for Recreational Waters Monitoring Program (MC 2015-006) - Water Quality Guidelines and General Effluent Standards of 2016 (DAO 2016-08) - Adoption of Integrated Water Quality Management Framework (DAO 2013-08) - Procedural Manual for the Designation of Water Quality Management Areas (MC 2009-15) - Ambient Water and Effluent Quality Monitoring

			(MC 2008-008) Source: https://water.emb.gov.ph/?page_id=396
	2. Any "Legislation/Regulations" for water pollution control (i.e. for the management of water quality and wastewater quality)	Yes	The primary law addressing water pollution in the Philippines is the **Philippine Clean Water Act of 2004** (Republic Act No. 9275), which aims to protect water bodies from pollution from land-based sources. This law outlines water quality standards and regulations, and is applicable to all water bodies, including fresh, brackish, and marine waters. It also provides for the abatement and control of pollution from various sources, including industries, agriculture, and community/household activities. While focused on air, the **Philippine Clean Air Act of 1999** includes provisions for regulating pollution from stationary sources, including those that discharge liquid effluents into water bodies. **Local Government Code of 1991** (RA 7160) mandates LGUs to provide basic services including sanitation, drainage, and waste disposal. Many LGUs enact local ordinances for septage, sewerage, and water quality control. The **Water Code of the Philippines** (1976) Governs the ownership, appropriation, use, and control of water resources. Provides the legal basis for regulating the pollution and degradation of water bodies. The Philippines has endeavored to improve its management of solid waste through the passage of RA 9003 or the **Ecological Solid Waste Management Act** that provides for a systematic, comprehensive and ecological waste management program to ensure the protection of public health and the environment. It mandates the bureau to provide secretariat support to the National Solid Waste Management Com mission in the implementation of the solid waste management plans and prescribes policies to achieve the objectives of the National Ecology Center that is in charge of information dissemination, consultation, education and training of various local government units on ecological waste management. The **Extended Producer Responsibility Act**

			(EPRA) of 2022 is an Act institutionalizing the extended producer responsibility on plastic packaging waste, amending Republic Act No. 9003, otherwise known as the Ecological Solid Waste Management Act of 2000. The EPRA lapsed into law on 23 July 2022. It requires large companies to adopt and implement policies for the proper management of plastic packaging wastes. The Act was crafted in response to the clamor to regulate single-use plastics and their production, importation and disposal by industries. The EPR law sets incremental targets that should be fulfilled yearly until 2030. For 2023, obliged companies must recover 20% of their plastic footprint from the year before. Producers, distributors, and retailers implementing initiatives under the EPR laws will be eligible for tax incentives.
	3. Any “Financial framework and Financial plans” for water pollution control	Yes	The Philippines has established a comprehensive financial framework to address water pollution control, integrating national policies, dedicated funds, and innovative financing mechanisms. This approach aims to mobilize resources, encourage private sector participation, and ensure sustainable management of water resources. Philippine Clean Water Act of 2004 (Republic Act No. 9275) provides the foundation for water quality management in the country. Key financial provisions include: • **National Water Quality Management Fund (NWQMF):** Administered by the Department of Environment and Natural Resources (DENR), this fund supports pollution containment, ecosystem restoration, research, enforcement, and public education. It is replenished through fines, permit fees, donations, and government allocations • **Area Water Quality Management Fund (AWQMF):** Established for specific water bodies, this fund finances local water quality improvement projects, including wastewater treatment infrastructure and maintenance. • **Wastewater Charge System:** Implements fees based on the pollutant load of discharges, incentivizing industries to invest in pollution control technologies. Public-Private Partnerships (PPPs): LGUs can

			engage in PPPs to finance, build, and operate wastewater treatment facilities, leveraging private sector expertise and capital.
IS Indicators	1. Any "Agency/ Department" responsible for water pollution control	Yes	The **Environmental Management Bureau** is a Line Bureau (by virtue of Section 34 of The Philippine Clean Air Act Of 1999 (RA 8749)) of the Department of Environment and Natural Resources. The Bureau is mandated to implement on a nationwide scale, six (6) important Environmental Laws: • Environmental Impact Assessment Law (PD 1586) • Toxic Substances and Hazardous Waste Management Act (RA 6969) • Clean Air Act Of 1999 (RA 8749) • Ecological Solid Waste Management Act (RA 9003) • Clean Water Act (RA 9275) • Environmental Awareness and Education Act Of 2009 (RA 9512) The **River Basin Coordinating Office (RBCO)** of the Department of Environment and Natural Resources (DENR), as provided by *EO 510, s. 2006*, was mandated, together with other government agencies to: a) rationalize the various existing basin projects, such as but not limited to the projects stated in the EO b) rationalize and prioritize reforestation in watersheds, such as but not limited to the watershed of Pampanga River & Bicol River c) develop a national master plan for flood control by integrating the various existing river basin projects. In *2009, EO 816* declared RBCO as the lead government agency for the integrated planning, management, rehabilitation and development of the country's river basins. Based on the said EO, RBCO is mandated to rationalize and integrate all national plans, projects and programs, within the country's river catchment basins. As the oversight agency for all government efforts and initiatives within the country's river basins, the RBCO developed the Integrated River Basin Management and Development Framework Plan as a guide in developing integrated river basin master plans. RBCO also undertakes organization/strengthening of River

			Basin Organizations and implements capacity building for RBCO technical personnel.
	2. Any “Steering Committee” on river water quality and environmental issues (e.g inter-agency committee)	Yes	The designation of **Water Quality Management Area** is one of the strategies identified to effectively enforce the Clean Water Act 2004 and improve the water quality of water bodies through focused interventions or actions that are designed to address specific water quality issues of the areas. Therefore, the designation of WQMA takes into consideration water quality problems, its sources of pollution, and the beneficial use of the receiving water body; and determines what combination of control measures can effectively achieve water quality objectives or improvements. The WQMAs are governed by a governing board composed of representatives of mayors and governors of member LGUs, and representatives of relevant national government agencies, duly registered nongovernmental organization, water utility sector, and business sector. The DENR representative through the EMB shall chair the governing board. In the case of the LGUs with memberships on more than one (1) management board, the LGU shall designate only one (1) single representative for all the management areas where it is a member. To date, there are forty (40) officially-designated WQMAs, including the areas within the jurisdiction of LLDA which was designated as one management area by virtue of the Clean Water Act.
	3. Any “Formal institutional arrangements” among related agencies to manage water pollution	Yes	**Water Resources Management Office (WRMO).** Established under Executive Order No. 22, the WRMO is situated within the Department of Environment and Natural Resources (DENR). It consolidates functions from various agencies—including the National Water Resources Board (NWRB), National Irrigation Administration (NIA), and National Power Corporation (NPC)—to streamline water governance and policy coordination. This office plays a pivotal role in addressing water pollution by integrating water-related mandates and fostering inter-agency collaboration. **Inter-Agency Council for the Pasig River Urban Development.** Formed under Executive Order No. 35, this council is tasked with facilitating and ensuring the full rehabilitation of

			the banks along the Pasig River and nearby water systems. It is chaired by the Department of Human Settlements and Urban Development (DHSUD) and includes members from various agencies, including the DENR, Metropolitan Manila Development Authority (MMDA), Department of Public Works and Highways (DPWH), and others. The **Manila Bay Task Force** was established to oversee and expedite the rehabilitation of Manila Bay, as mandated by the Supreme Court's Writ of Continuing Mandamus issued in 2008. This writ directed 13 government agencies to clean up, rehabilitate, and preserve Manila Bay, restoring its waters to a level fit for swimming, skin-diving, and other forms of contact recreation
	4. Any “Private/ public partnership and participant” in managing water pollution	Yes	Notable Public-Private Partnerships in Water Pollution Management includes: **Maynilad Water Services, Inc.** Maynilad, the West Zone concessionaire for Metro Manila, has partnered with various government agencies to protect waterways from untreated wastewater. Through a Memorandum of Understanding, Maynilad collaborates with the Department of Environment and Natural Resources (DENR), the Metropolitan Waterworks and Sewerage System (MWSS), and the Laguna Lake Development Authority (LLDA) to rehabilitate Manila Bay by ensuring compliance with the Philippine Clean Water Act. Source: https://www.mayniladwater.com.ph/maynilad-partners-for-the-protection-of-waterways/?utm_source=chatgpt.com **The Masungi Georeserve Foundation, Inc**. is a privately-led conservation effort focused on protecting the Marikina Watershed. Through eco-tourism and reforestation projects, the foundation aims to restore forest cover, improve water quality, and promote sustainable livelihoods for local communities. Their work has garnered international recognition, including the Water ChangeMaker Award from the Global Water Partnership. **Adopt-an-Estero/Water Body Program** is a collaborative undertaking between and among the Estero Community, Donor-Partner, Local

			Government Unit/s, other government agencies and the DENR. Mobilize estuary communities in cleaning the estuary and enlist their active participation in the actual clean up, and in implementing and preparing plans to sustain a clean estuary in the future years. A Donor/Partner may be a business establishment, an industry association, a non-government organization or any other group that volunteers to be a major actor in cleaning the esteros. The donor may accept full undertaking in the clean-up of an estuary or may just provide equipment and manpower to do actual clean-up in partnership with the DENR and other donors. On its own, the donor-partner may decide to identify an estuary, provided the estuary has not been taken by or assigned to another donor partner. The Memorandum of Agreement (MOA) for Adopt –an- Estero/River Water Body Program is a public-private partnership that recognizes activities leading to the restoration of a specific water body such as creek and river.
MT Indicators	1. Any river water quality master plan at national and local levels	Yes	At the national level, the **River Basin Control Office (RBCO)** under the DENR is responsible for the integrated planning, management, rehabilitation, and development of the country's river basins. The RBCO has developed master plans for various river basins, which include strategies for water quality management, flood control, land use planning, and ecosystem restoration. In addition, the Department of Environment and Natural Resources (DENR) has developed the **Integrated Water Resources Management Plan** (IWRMP) to guide the sustainable management of the country's water resources. This plan integrates various sectoral strategies, including the Philippine Water Supply and Sanitation Master Plan (PWSSMP) and the National Irrigation Master Plan (NIMP), to ensure coordinated efforts in water resource management. At a regional scale, Under the Philippine Clean Water Act of 2004 (RA 9275), the DENR designates specific water bodies as WQMAs to address water quality issues. Each WQMA is managed by a governing board comprising representatives from local government units (LGUs), relevant national agencies, and stakeholders. These boards are responsible for

			developing and implementing 10-year action plans tailored to the specific needs of their respective areas.
	2. Any relocation plans for highly polluting industries in a river basin	Yes	While specific large-scale industrial relocations are not frequently reported, the government has implemented measures to regulate and relocate industries and settlers contributing to pollution in river basins: • The Pasig River Rehabilitation Commission (PRRC) has been involved in relocating informal settlers along the riverbanks and enforcing regulations to prevent industrial pollution. Efforts include relocating squatters and implementing buffer zones to protect the river from industrial discharges. The Inter-Agency Council for the Pasig River Urban Development (IAC-PRUD) is spearheading a comprehensive rehabilitation plan for the Pasig River. This includes the development of a 25-kilometer river esplanade and the establishment of a 150-hectare park in Rizal Province. A key component of this plan is the relocation of informal settlers residing along the riverbanks. The IAC-PRUD is tasked with identifying suitable relocation sites and formulating strategies for the economic and social integration of relocated communities Source: https://pco.gov.ph/news_releases/pbbm-constitutes-inter-agency-council-for-pasig-river-rehabilitation-efforts/ • In Puerto Princesa, Palawan, the local government has initiated the "Save the Puerto Princesa Bays" program to address pollution from over 5,000 coastal households. The program includes relocating informal settlers to newly acquired lands in Barangays Irawan and San Jose, where affordable housing units will be constructed. This initiative aims to reduce pollution from untreated wastewater and promote the recovery of the marine ecosystem Source: https://palawan-news.com/citys-save-the-bays-project-signals-ambitious-

			goal-to-relocate-5500-coastal-dwellers/
	3. Any effluent discharge standards	Yes	Philippines enforces effluent discharge standards through the Department of Environment and Natural Resources (DENR) via Administrative Order No. 2016-08, titled **Water Quality Guidelines and General Effluent Standards of 2016**. This order sets the maximum allowable concentrations of pollutants in wastewater discharges based on the classification of the receiving water body and its intended beneficial use. Moreover, the Department reviews and sets effluent standards every 5 years which provides modification of Water Quality Guidelines and General Effluent Standards.
	4. Any river water quality monitoring program	Yes	In December 2008, DENR-EMB issued Memorandum Circular 008, s. of 2008 which standardizes procedures/protocols on ambient water and effluent quality monitoring to ensure that water quality monitoring programs follow certain Quality Assurance/Quality Control (QA/QC) protocols and acceptable field methods. It was accompanied by monitoring manuals consisting of Volume I (Ambient Water Quality Monitoring) and Volume II (Effluent Quality Monitoring). Moreover, under the Clean Water Program, the activities such as continuous monitoring of the status of water quality, Classification of Waterbodies, Designation of Water Quality Management Area (WQMA), Implementation of Adopt-an-Estero Program, Compliance Monitoring of Firms, and Clean-up of water bodies, rivers systems and tributaries were conducted continuously by the Department to ensure and achieve the desired condition of water quality in the country. Source: https://denr.gov.ph/wp-content/uploads/2024/04/DENR-Annual-Report-for-FY2022_.pdf
	5. Any river water quality information system/ database	Yes	In 2022, The Department of Environment and Natural Resources (DENR), through the Environmental Management Bureau (EMB), launched a data center that provides real-time monitoring of air and water quality, including the status of solid and hazardous waste

			management, facilities with environmental compliance certificates (ECCs), and online permitting system. Water quality monitoring for selected surface water bodies is also being conducted by EMB covering parameters such as Dissolved Oxygen (DO); Biochemical Oxygen Demand (BDO); Total Suspended Solids (TSS); and Total Dissolved Solids (TDS). Data collected informs policy decisions and the effectiveness of implemented action plans. Regular assessments ensure that strategies remain responsive to emerging challenges in water quality management. Source: https://denr.gov.ph/news-events/denr-unveils-environmental-quality-data-center/ **The River Basin Integrated Information Management System (RB-IIMS)** is a system used by the River Basin Control Office (RBCO) of the Department of Environment and Natural Resources (DENR) in the Philippines to manage information related to river basins. It serves as a central repository for various data and information related to river basin management, including water resources, environmental quality, and climate change impacts.
	6. Any program to disseminate to the public regulator report on river water quality status	Yes	The Department of Environment and Natural Resources (DENR), through the Environmental Management Bureau (EMB), manages an environmental quality data center. The facility strengthens DENR's push for transparency and good governance as the platform allows for early detection of pollutive activities, as the center is equipped with a notification system which is set off once it records an exceedance in emission from a plant connected to its system. Other vital information stored in the data center includes online application and processing for wastewater discharge permits along with the names of applicant-firms that have been approved and denied, providing public transparency on the compliance of establishments to the DENR effluent quality standards. The public can also access data on the status of solid waste management facilities including the materials recovery facilities (MRFs) at the barangay level and 10-year solid waste management plans that have been submitted by

			local government units (LGUs) to the National Solid Waste Management Commission.
	7. Any groundwater quality monitoring programs and systems	Yes	The Philippines has established several groundwater quality monitoring programs and systems to assess and manage its groundwater resources effectively. These initiatives are primarily led by the Department of Environment and Natural Resources (DENR) and its attached agencies, in collaboration with academic institutions and local government units. **The National Groundwater Resources and Vulnerability Assessment Program** implemented by the Mines and Geosciences Bureau of is conducted to determine the availability of groundwater resources and the threats to contamination and depletion. It shall cover a regional assessment (per province for Y2016-2019) and a local assessment (per municipality levels for Y2019 onwards). In terms of the regional scale, the program shall generate a 1:250,000 scale hydrogeologic and groundwater availability maps and update the existing ones. Field surveys and mapping on the city/municipal scale shall be carried out on a 1:50,000 scale or better depending on the needs of particular sites or areas. This will integrate climate change impacts in some critical areas that will be identified during the assessment such as changes in sea level which might affect groundwater resources in the coastal areas and effect of the reduction in the recharge of the groundwater due to drought. Particular emphasis will also be placed on characterizing the vulnerability of the groundwater resource to human impact on the environment such as over-extraction, pollution from industries and deterioration of viable aquifers or reservoirs due to land degradation and surface development. Under its program titled **"Establishment of Groundwater Monitoring Wells in Water Constraint Areas",** The National Water Resources Board (NWRB) has also been actively establishing groundwater monitoring wells in areas facing water constraints across the Philippines. Data collection on water level and water quality from established wells is being conducted by NWRB to monitor the trend of groundwater level and quality in the areas. This initiative is part of the NWRB's

			broader strategy to manage and protect the country's groundwater resources, particularly in regions experiencing significant water stress.
	8. Any computer simulation models used to predict river water quality	Yes	Some of the independent research and development programs for water quality management initiated by academic institutions includes: • **Numerical Model to Estimate the Sediment Oxygen Demand (SOD) of the Pasig River** (DLSU, 2009). This research focused on SOD, defined as the rate at which dissolved oxygen is removed from the water column in surface waters mainly due to the respiration of benthic organisms and decomposition of organic matter in the riverbed or bottom sediments. It showed that 30 to 90 percent of the total oxygen uptake in shallow and slow-moving waters was contributed by SOD. In a slow-moving water body with high organic sediment levels such as the Pasig River, SOD can be a major cause for the constantly low DO level in the water column, particularly in the summer period. SOD data collected in this study can be one of the many input coefficients needed for water quality models that simulate the effect of an organic waste load on the river's DO level. SOD can be an additional criterion for evaluating surface water under RA 9275 and other water regulations like DAO 1990-34. • **Application of Sediment Quality Guidelines along Tributaries of Pasig River by the U-Belt Consortium** (2009). This project was led by the U-Belt Consortium together with the Industrial Technology Development Institute (ITDI) of DOST in cooperation with PRRC, MMDA, and ABS-CBN Foundation, Inc. The Consortium members include FEATI University, Adamson University, Arellano University, Centro Escolar University, Far Eastern University, Jose Rizal University, Lyceum of the Philippines, Manuel L. Quezon University, Mapua Institute of Technology, National University, University of the East, University of Manila, and University of Sto. Tomas. This project assessed the sediment

			quality of Estero de Sante Bañez located in Brgy. Cristobal, Manila, which is one of the tributaries of Pasig River. Sediment samples were collected in its three sampling stations and analyzed for traces of heavy metals such as lead, copper, chromium, zinc, cadmium, nickel, and mercury. Analyses showed that there were variable distributions of the heavy metal content from the three sites of the estero. Source: https://water.emb.gov.ph/wp-content/uploads/2016/06/NWQSR2006-2013.pdf
	9. Any public awareness program on water pollution prevention	Yes	The Philippines has a robust and multifaceted public awareness program focused on water pollution prevention, spearheaded by the Department of Environment and Natural Resources (DENR), local government units (LGUs), and various civil society organizations. These initiatives aim to educate the public, promote sustainable practices, and foster community involvement in water conservation efforts. This includes: • **World Water Day Celebrations.** The DENR, through its River Basin Control Office (RBCO), collaborates with agencies like the National Water Resources Board (NWRB) and Manila Water Foundation to organize exhibits and events on World Water Day (March 22). These activities showcase innovative water management practices and engage the public in discussions about water conservation and pollution prevention. For instance, in 2024, a "moving exhibit" was held in Quezon City, featuring interactive displays from various organizations and public schools, emphasizing the theme "Water for Peace" • **Educational Tours and Clean-Up Activities.** The Environmental Management Bureau (EMB) in the National Capital Region (NCR) conducts educational tours and clean-up activities to raise awareness about water pollution. In 2023, the EMB-NCR organized the "Lakbay Manila Bay" tour, visiting eco-friendly sites like the Philippine

			Permaculture Association's headquarters to demonstrate sustainable water systems. • **School-Based Competitions.** To engage the youth, the DENR and EMB organize competitions such as poster-making, essay writing, and quiz bee contests in schools. For example, in Dagupan City, the Dagupan City Water District (DCWD) and the Department of Education (DepEd) hosted contests on World Water Day 2024, focusing on water conservation and pollution