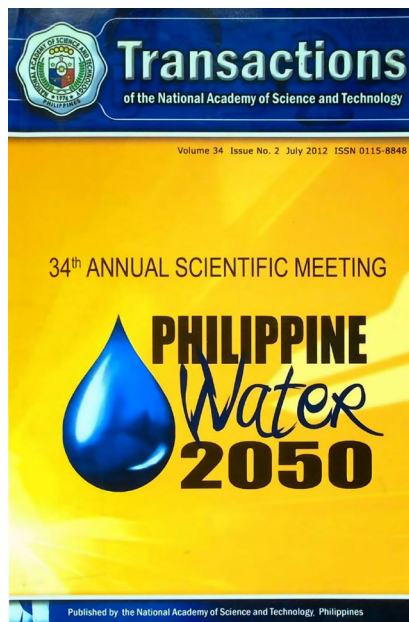


Transactions NAST PHL, is the official journal of the National Academy of Science and Technology Philippines. It has traditionally published papers presented during the Academy's Annual Scientific Meeting since 1979 to promote science-based policy discussions of and recommendations on timely and relevant national issues as part of its functions as a national science academy. Starting in 2021, this journal has been open to contributions from the global scientific community in all fields of science and technology.



Philippine Water 2050

RESOLUTIONS

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Republic of the Philippines
Department of Science and Technology
NATIONAL ACADEMY OF SCIENCE AND TECHNOLOGY PHILIPPINES

PHILIPPINE WATER 2050

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RESOLUTIONS

Whereas, water is absolutely essential for life and therefore a basic human need;

Whereas, providing access to clean drinking water and basic sanitation are part of the eight Millennium Development Goals to which the United Nations have committed to improve the human condition, in as much as the overarching goal of reducing poverty cannot be achieved if people suffer from diarrhea and various water-borne diseases;

Whereas, beyond meeting the very basic of human needs, fresh water is necessary for the production of crops, fishery and livestock for food, as well as for many industrial processes;

Whereas, electricity is generated from hydropower plants which energy is more sustainable and a non-polluting alternative to fossil fuels;

Whereas, water-related events like typhoons, floods and landslides bring untold misery and injury especially among the poor who live in vulnerable areas;

Whereas, the Philippines because of its fortunate geography and location is blessed with bountiful rainfall which should be adequate if only the rains were captured and stored in surface water impoundments or to recharge to groundwater aquifers and safely released or extracted gradually over the years;

Whereas, until today there are still many municipalities and barangays without access to safe water supply;

Whereas, heavy human and property losses are incurred each year from disastrous typhoons, floods and landslides for which our people should prepare in order to minimize or adapt to their consequences;

Whereas, pollution and overexploitation of wetlands and despoliation of watersheds are endangering the capacity of the future generations of Filipinos to provide for their freshwater needs;

Whereas, pollution of coastal areas pose risks to the well-being of marine biodiversity and marine fishery species;

Whereas, the governance of water resources is necessarily complex and often fragmented because of multiplicity of competing uses, multitude of stakeholders and beneficiaries, and different levels of political authority and decision making;

Whereas, there is an urgent need to systematically assess demand and availability of water resources well into the future; to carefully plan for the protection and conservation of watersheds and wetlands; to prepare vulnerable communities and households to water-related hazards thereby minimizing their impacts; to rationalize policies and laws governing use, allocation and pricing of water, as well as consolidate the public structures which preside over the conservation and management of the country's water resources;

NOW, THEREFORE, the National Academy of Science and Technology, Philippines, resolves that the country lay out a long-term master plan with continuous updating at the national, regional and local levels for the conservation, development and sustainable utilization of the country's freshwater resources. Specifically the Academy recommends that:

- **Office of the President and Legislative Bodies**

- a. Support the reconstitution, elevation and transformation of the current National Water Resources Board (NWRB) into the National Water Resources Management Office (NWRMO) under the Office of the President who will be mainly responsible for the control, management and protection of the country's water resources through Integrated Water Resources Management (IWRM) and good governance.

NWRMO should conduct comprehensive water assessment studies periodically of the state of water resources of the country and continual development of river basin masterplans;

- b. Integrate water policies into the broader national development policy and strengthen legal, institutional and regulatory water frameworks. This will require periodic comprehensive water assessment in the country;

- c. Provide human capacity development funds towards effective planning and decision-making for integrated water resource management;
 - d. See to the strong implementation, enforcement and compliance of existing water laws. In particular, adopt a self enforcing mechanism for proper and efficient delivery of water services;
 - e. Promote the use of surface water as source of potable water; consider groundwater as reserve rather than as primary source of potable water;
 - f. Institutionalize the National Wetland Action Plan through an Executive Order and create a National Wetlands Committee; and
 - g. Promote the organization of river basin organizations (RBO) for IWRM at regional and local levels such as the creation of an Agusan River Basin Development Authority.
- **Department of Agriculture (DA)**
 - a. Expand irrigated areas and improve irrigation performance through canal offtake retrofitting, cropping pattern optimization, and sustainable irrigated agriculture; specifically, continue support to NIA and LGUs for the further development and expansion of new irrigated lands (so far only half of the 3.1 million hectares potentially irrigable lands have been developed);
 - b. Expand support for the development of small water impounding, ponds and reservoirs being promoted by the Bureau of Soil and Water Management (BSWM) to complement the bigger national and communal irrigation systems constructed by the National Irrigation Administration (NIA) and Local Government Units (LGUs);
 - c. Enhance water efficiency through excess water management, water use efficiency improvements, water quality protection and management, promotion of efficient irrigation technologies, and wastewater treatment and re-use; and
 - d. Reiterate a previous recommendation to strengthen NIA's Irrigation Management Transfer Program and to provide training to the farmer beneficiaries (Irrigators Associations) to assume more and more responsibility for the management, utilization and rehabilitation of their irrigation systems under the technical supervision of NIA; as an incentive the Irrigators Association shall keep, say 90% of the water

fees they collect to meet the costs of system maintenance and as capital build up for their cooperatives.

- **Department of Environment and Natural Resources (DENR)**

- a. Review and synthesize research results and monitoring data that can be useful for the economic modelling and ecosystem studies of major lakes to facilitate the setting up of operational decision support system for efficient and effective delivery of services. Population growth and human stresses be closely estimated/quantified and inputted in the decision support system specific to each major lakes;
- b. Pursue protection and wise management of watersheds which are crucial to ensuring sustainable water supply, and maintenance of ecosystem services;
- c. Sustain regular environmental monitoring of major wetlands by mobilizing state universities and colleges (SUCs) in the regions with expertise and facilities; and
- d. Support capacity building activities that promote watershed as the planning unit for water resources management.

- **Department of Science and Technology (DOST)**

- a. Modernize and develop the infrastructure for the acquisition, storage and dissemination of natural resource data and natural disaster data such as topography, bathymetry, soil types and properties, geology, hydrogeology, climate data (solar radiation, temperature, wind, humidity, rainfall, etc.) hydrological data (discharges, soil moisture, evaporation) water quality, land use and cover, etc. through cost-effective state-of-the-art space-based and ground-based technologies;
- b. Expand the water quality parameters, to include DO, BOD, nutrients, selected heavy metals monitored by NOAA for the management of rivers, inland and coastal areas;
- c. Develop a unified research agenda for water;
- d. Develop appropriate and cost-effective management technologies to scientifically determine the carrying capacities of the inland water bodies;

- e. Develop technologies and plant varieties to cope with water stress including drought, flooding and salinity;
 - f. Constitute and support R and D groups in SUCs to monitor and study the ecology and biodiversity of major wetlands; and
 - g. Continue to engage in capacity building through scholarships, fellowships and travel grants to scientific conferences.
- **Department of Public Works and Highways (DPWH)**
 - a. Assume a nationally proactive role in developing the sanitation components (piped sewerage and treatment and trucked septage treatment) as necessary integral parts of all water supply projects, by availing of international funding (World Bank, ADB, USAID, etc.) prioritized for Water and Sanitation projects by forming alliances with DILG, LGUs, and water districts, and other utilities in planning and implementation;
 - b. Set up an appropriate unit that will handle strategies and action plans to achieve universal coverage and to assume more pro-active, transparent, and accountable roles in support of water supply, sanitation, and sewerage service delivery;
 - c. Integrate and orchestrate all water sub-sector roadmaps for harmonization and cooperation among the sub-sectors;
 - d. Address decisively and quickly the illegal encroachment and occupation of natural channel ways and floodways which impede the flow of water;
 - e. More accurate estimates both of flood magnitude and of flood return period associated with extreme/catastrophic rainfall events like Ondoy must be made and considered in determining designs of flood control infrastructures such as dams and drainage systems as well as development of flood management strategies;
 - f. Promote artificial ground water recharge such as construction of infiltration galleries as part of rainfall harvesting mandate of the agency. Infiltration galleries can be at small scale along peripheral wall of buildings or at large scale as part of surface or sub-surface flood detention ponds.

- **Department of Health (DOH)**
 - a. Improve surveillance and control programs of food-borne and water-borne diseases as well as acute and chronic diseases due to cluster and long-term exposure to non-biological and chemical agents;
 - b. Evaluate new and existing public health interventions aimed at reducing water-borne and water-related diseases by developing and improving environmental sampling methods, detection and diagnostics tests, and disinfection and filtration systems both for biological and non- biological agents;
 - c. Review, update, and harmonize water quality standards and monitoring guidelines for municipal drinking water, bottled water and water from refilling stations; and
 - d. Strengthen the capacity of Food and Drug Administration (FDA) to monitor the quality of bottled drinking water

- **Department of Interior and Local Government (DILG) Water Administrators (NWRB, LWUA, MWSS, PEZA and LGUs)**
 - a. Implement existing laws and engage in activities that will actively protect the groundwater from contamination and extraction beyond safe yield;
 - b. To ensure safe drinking water in all cities and communities raw water should be stable and protected; treatment process should be robust; monitoring should be stringent; compliance should be a commitment and water quality should be prioritized;
 - c. Protection of source water quality and better tap water treatment strategies are urgently needed to ensure that we will continue to have access to safe and healthy water; and
 - d. Promote community based programs for efficient water delivery especially in slums and impoverished communities.

Done on this 12th day of July 2012 at the historic Manila Hotel, City of Manila.