

NWRB Major Programs/Projects and Status of Implementation for CY 2019

1. Development of Groundwater Management Plan and Establishment of Groundwater Monitoring Wells in Critical Areas

In pursuance to the urgency of protecting the groundwater resource of the groundwater constraint areas and recognizing it as a reserve resource that may be tapped during extreme drought and disasters, the NWRB proposed the development of groundwater management plan (GMP) which started in 2014. This is in collaboration with LGUs, NGAs, private and academic institutions. It will provide a comprehensive picture of the groundwater aquifer not only in terms of defining their locations and areal extent, but also in terms of their hydraulic properties and internal characteristics.

NWRB started the program, "Development of Groundwater Management Plan for Highly Urbanized Water Constraint Areas" which piloted in the city of Iloilo. Final report for Iloilo was already completed in 2014. Policies on groundwater management in the area based from the recommendations in the plan will be formulated.

As of 2018, there are already ten (10) GMP developed. Development of GMP were pursued in the areas of Iloilo, Cagayan de Oro City, Angeles City in Pampanga, Bacolod City, Baguio City, Metro Manila, Metro Cebu, and Zamboanga City, Batangas and Tagbilaran City completed. For 2019, Development of GMP for Cavite City and surrounding areas (Carmona, Dasmarias, GMA, Gen. Trias, Imus, Rosario, Tanza, Bacoor, Naic and Trece Martires) is on-going.

Major component of the program is the establishment of groundwater monitoring wells in the critical areas with GMP. This will serve as a mechanism of monitoring the effectiveness of existing groundwater policy in the area as well as basis for appropriate protection and conservation interventions.

In 2014, eight (8) monitoring wells were established in Pavia, San Miguel, Alimodian, Oton, Pagsanga-an and Iloilo City and are already operational until present. Ten (10) monitoring wells were installed in Cagayan de Oro City from 2015-2016. Six (6) monitoring wells were already constructed in Angeles City, four (4) in Metro Manila, four (4) in Bacolod City, three (3) in Cavite, two (2) in Mabalacat Pampanga from 2016-2017. Establishment of one monitoring well in Talisay, Negros Occidental and two (2) monitoring wells in Metro Cebu is already completed in 2018. Data collection on water level and water quality from these wells is being conducted by NWRB to monitor the trend of groundwater level and quality in the areas. There is already a total of forty two

(40) groundwater monitoring wells established in nine (9) groundwater critical areas as of 2018.

For 2019, drilling of monitoring wells in Zamboanga and the remaining one (1) well in Mabalacat Pampanga will be continued. Two (2) monitoring wells in Metro Cebu will be established in addition to two monitoring wells established in 2018. Establishment of groundwater monitoring wells in Tagbilaran, Bohol and Batangas City will also be conducted after coordination with concerned LGUs and Department of Education (DepEd)

Local Government Units (LGUs) are involved in the identification of monitoring wells' site and provision of land area to NWRB for the installation of well through a MOA among LGU, Department of Education (DepEd) and NWRB. They are responsible for the protection of the well and conduct GW data collection if provided with necessary equipment.

The overall goal of the program is to effectively and equitably manage the groundwater resources of the study area through the development of a systematic and science-based management strategies that does not only consider current situation but as well as the future impact of climate change to ensure long-term sustainability of this resource.

2. Comprehensive Water Resources Assessment for Major River Basins

Comprehensive Water Resources Assessment for Major River Basins is a long term program of NWRB to formulate a scientific report of the available water considering the current changes and trends in the use of water resources such as climate change and increasing developments, which will be the basis for policy, planning, programming and project implementation.

The project is an assessment and updating of water availability and quality situation in the river basin. The main objective of this endeavor is to garner a holistic knowledge on the current water resources situation of the area which will be used in the effective implementation of NW RB's regulation and policy formulation functions.

The NWRB first conceptualized the Comprehensive Water Resources Assessment (CWRA) for the Agno River Basin which was completed in June 2016. Assessment for Panay River Basin and Davao River Basin was completed in 2017 and 2018 respectively. CWRA for the Jalaur River Basin was completed as scheduled in 2018. CWRA for the Bicol River Basin will be conducted in 2019.

The results of the study provide scientific basis towards more responsive and flexible policies in addressing current water issues particularly the impact of climate change

on water. Recommended water policies and management strategies based from the project results are tools to enhance water resource allocation LGUs can adopt and use the study results in their water resource development and management initiatives.

3. Sustainability of Listahang Tubig (Water registry) Database

The Listahang Tubig started as a project in 2014 supported by a partnership among the NWRB as the lead agency, DILG, and the LWUA under a MOA with other cooperating agencies namely the NEDA, USAID, PAWD, and all Provincial/Municipal Local Government Operations Offices and Local Government Units (LGUs).

Its primary objective is to create a database of water utilities operating in the Philippines and to facilitate improvement in water regulation and water service delivery through access to information of participating water service providers (WSPs).

In 2015, the first of its kind countrywide survey was completed by the five assessment teams of World Bank through the utmost cooperation of all participating parties. Although it's primary objective is only to create a database of water utilities operating in the Philippines, it expanded to generating profiles, establishing a benchmark for level 3 water utilities, facilitating improvement in water regulation and water service delivery through access to information of participating water service providers (WSPs).

The NWRB was tasked to sustain the cloud-based system where the basic data of water service providers would be made available to all users. As the Listahang Tubig administrator, the NWRB continuously populate, validate and update the data to support various stakeholders on their data requirements.

All water service providers were enjoined to encode the necessary data in the said website, which is intended to be updated annually thereafter. Water Service Providers will update and upload the data directly in the Listahang Tubig website, <http://listahangtubig.cloudapp.net>.

Re-orientation Workshops on the Listahang Tubig were conducted in ten (10) provinces namely, Aklan, Bataan, Bukidnon, Cagayan, Davao del Norte, Leyte, Nueva Ecija, Rizal, Sarangani and Zambales) in 2018 to be followed by the remaining provinces in the succeeding years. The participants during the said workshops committed to update/upload data/information of FY 2016 to FY 2018 to the Listahang Tubig website (<http://listahangtubig.cloudapp.net>) and hopefully will continually update the data/information thereafter.

As of 2018, water utilities registered to Listahang Tubig website increased by 9.45% and water utilities with updated data increased by 41.98%.

There are ten (10) provinces (Ilocos Sur, Ilocos Norte, Nueva Vizcaya, Aurora, Albay, Capiz, Eastern Samar, Camiguin, Davao Del Sur and Davao Oriental) programmed

for 2019 where another reorientation workshops will be conducted

4. Automated Real Time Monitoring System (ARMS) for Major Dams

The ARMS Project is a joint project between Mapua Institute of Technology (MIT), Philippine Council for Industry, Energy and Emerging Technology Research and Development – Department of Science and Technology (PCIEERD-DOST) and the National Water Resources Board (NWRB). The pilot testing to remotely monitor real-time hydrological parameters in the watershed and dam reservoir using installed sensors which are all based in WMO standards will help in estimating the amount of available water in the basin. Monitoring of dam reservoirs has been one of the major role of NWRB and having real -time data will help the agency in making efficient decisions.

The overall objective of the Project is to provide an automated real-time monitoring system of measured hydrological and operational parameters at the dam/reservoir for an accurate assessment of situation and time critical decisions during emergency and crisis management

ARMS – 1 for Ambuklao Binga and San Roque Dams started in 2016 and still on-going. Installation of nine (9) remote stations for monitoring of 7 parameters (temperature, humidity, pressure, rainfall, and wind speed & soil moisture) and three (3) water level stations in Ambuklao, Binga and San Roque Dams is already completed.

For 2019, the following activities are: 1) setting up and installation of computer software in NWRB; 2) training on system's operation for the NWRB and dam operators personnel; and 3) enhancement of the sensors and the system.

ARMS-2 for Magat Dam started in 2018. Collection of secondary data and site reconnaissance for the proposed stations will be continued in 2019. Sensors will be fabricated for calibration.

ARMS -3 for Pantabangan Dam started in 2018. Collection of secondary data and site reconnaissance for the proposed stations will be continued in 2019.

5. Design and Development of Groundwater Monitoring System for Metro Manila, Cagayan De Oro, Bukidnon and Iloilo Groundwater Monitoring Wells

The project is the development of an automated real time monitoring system for

groundwater data thru a sensor network. Groundwater data will be distantly monitored in real time basis from the 22 monitoring wells established in Metro Manila (4 wells), Cagayan de Oro (9 wells), Bukidnon (1 well) and Iloilo (8 wells).

The data collected will be used in calibrating the developed modeling tools and will also serve as a tool to monitor the possible impact of climate change in terms of GW levels.

The project started in 2018. All locations of 22 wells are already surveyed. Manufacturing of sensors is on-going.

For 2019, installation of instrument in monitoring stations will be conducted.

6. Development of NWRB Water Permitting Management Information System (WPMIS)

One of the main functions of NWRB is granting or issuance of water permits. In order to fulfill its mandate of providing water for all in an effective and sustainable manner, the internal processes which starts from the filing of the application, evaluation and the grant thereof must cope with present technology, thus migrating from manual filing and screening to automated filing and processing.

The development of NWRB Water Permit Management Information System (WPMIS) is one of the agency's efforts in addressing changes requiring ICT (Information and Communication Technology) to cope with the technicalities of the modern times. With the project, the filing, screening and processing of water permit applications will be automated putting a greater weight or emphasis on digital aquifer analysis for a more science based water allocation for existing and future water users.

The project, WPMIS started in July 2018 and completed in the same year. The system is already developed and all the progress report were already completed and submitted.

For 2019, the WPMIS should be running so that water permit applications (WPAs) will be done on line. Since the WPMIS is a new system for WPA, IECs will be conducted to present the developed system to the concerned stakeholders and various users on the second quarter of 2019.