Disaster Risk Reduction: The role of Geological Survey Organizations (GSO) in understanding risk and informing risk reduction actions

Part I: The Enablers - Mechanisms that facilitate GSOs' role in disaster and climate risk management

06 February 2023

DENR-MGB AS A GEOLOGICAL SURVEY ORGANIZATION

JETHRO B. CAPINO
Geologist, Mines and Geosciences Bureau - Lands Geological Survey Division
OUTLINE

- DENR-MGB as a Geological Survey Organization
- National Geohazard Assessment and Mapping Program
- Enabling Mechanisms
- Ways Forward
In response to the geologic and climatic conditions of the country, the Philippine government mandated the DENR-MGB to implement various geosciences programs and act as the steward of its mineral resources to administer and dispose of its mineral lands and resources. (click)
Our division, in particular, undertakes numerous programs, projects, and activities under these flagship programs of our mother department. 001 is focused on geologic mapping, mineral resource development and reserve management, and geological laboratory services. 003, on the other hand, includes geohazard and groundwater assessment and mapping programs centered on risk reduction and resiliency. Other activities on information systems management, national and international linkages coordination, and Research & Development constitute the support to operations. (click)
But with the occurrence of disastrous hazard events in the past and the already-present threats of climate change, it is imperative for the Philippine government to maintain and strengthen its National Geohazard Assessment and Mapping Program (click)...
The program has two main objectives. One of which is identifying which areas in the country are susceptible or vulnerable to various geologic hazards. And the other equally important objective is the public awareness component of the program, which aims to mitigate the negative impacts and for more rational development, planning, and disaster management.
First off is the susceptibility assessment and mapping of DENR-MGB’s mandate – rain-induced landslide and flood hazards. This activity started off at a 1:50,000-scale and immediately followed by the more detailed 1:10,000-scale that concluded in 2014. Since then, the bureau has been updating these maps due to the dynamic nature of earth’s surface processes. After generating the Geohazard Susceptibility Maps, DENR-MGB launched its offshoot Vulnerability and Risk Assessment. However, at its current state, it is limited to risk exposure assessment of certain elements-at-risk, such as road network, built-up areas, and population, to rain-induced landslide and flood.
Last of the hazard identification project of DENR-MGB is the Karst Subsidence Hazard Assessment, which was prompted by the widespread occurrence of sinkhole collapse in Bohol Island following the 2013 earthquake. To achieve the 2nd objective of the program, the outputs of these projects are promptly and systematically relayed to relevant stakeholders – the Local Government Units, through the intensive Information, Education and Communication (IEC) Campaigns. This endeavor is being conducted at the provincial and municipal/city levels through lectures and workshops on basic geohazard information and map-reading skills. Apart from maps and reports, other paraphernalia, such as posters and flyers, were likewise provided to the local government and communities. Recently we have translated these posters and flyers to nine (9) major Philippine languages to effectively cascade these information to wider audiences. (click)
One critical application of DENR-MGB’s geohazard maps is for early warning and forecast during potentially disastrous weather systems. Using said maps, the bureau’s Geohazard Operation Center (OpCen) is able to generate a list of barangays/villages that may experience rain-induced landslide and flood based on forecast rainfall from the state weather bureau. This list is widely disseminated to our Regional Offices and other government agencies to activate appropriate protocols. Following disastrous hazard events, the DENR-MGB also conducts assessments, particularly for suitability of temporary shelters, resettlement sites, and evacuation centers. (click)
The DENR-MGB maps (click) are also publicly available through our own (click) online map portal and other multi-hazard, inter-agency, platform, (click) such as HazardHunterPH. (click)
The DENR-MGB maps (click) are also publicly available through our own (click) online map portal and other multi-hazard, inter-agency, platform, (click) such as HazardHunterPH. (click)
All these programs, projects, and activities of the bureau are made successful due to a variety of reasons. (click)
I have categorized the enabling mechanisms into three – institutionalized structures in place, science-informed policies and reforms, and the robust partnership with other agencies and the local government. (click)
The Philippine Government’s efforts on Disaster Risk Reduction and Management is harmoniously integrated through the formation of the National DRRM Council. It is led by the Secretary of National Defense and the DENR is part of its 14 line department members. Guided with a National DRRM Plan, member agencies and organizations are able to coordinate and collaborate on programs, projects, and activities to effectively achieve disaster resilience.
Furthermore, by virtue of these NDRRMC Memorandum Circulars (click), the DENR-MGB is institutionalized as one of the technical warning agencies, with focus on rain-induced landslide and flood. In the conduct of Pre-Disaster Risk Assessment (or PDRA), based on the forecast situation, regions activate appropriate alert levels, with their corresponding recommended actions. DENR-MGB Regional Offices likewise participate in Regional PDRAs and issue more localized warnings and recommendations to regional counterparts of National Government Agencies and the Local Government Units. (click)
The DENR-MGB Geohazard Operation Center is the unit primarily involved in the conduct of PDRA. Internally, the OpCen (click) has its Information and Communication Protocol in place, from its Central Office to its fifteen Regional Offices, with their corresponding bureau Special Orders. The communication flow to external formations and organizations are also in place. This ensures that timely and vital geohazard information is promptly disseminated to proper channels and its most important beneficiary – the public; also, this allows the top management to be informed with realtime updates and execute necessary action. (click)
Moving on to policies. Landmark policy reforms often resulted from historical disastrous hazard events. Following the Cherry Hills Subdivision Landslide in August 1999, the DENR issued an Administrative Order in 2000, which requires housing, land development, and other infrastructure projects to undergo Engineering Geological and Geohazard Assessment (or EGGA), which shall be reviewed by DENR-MGB.
After Tropical Storm Ondoy (click) devastated the country’s capital of Metro Manila in September 2009, the Republic Act 10121 (click) or the Philippine DRRM Act of 2010 was passed, which also led to the formation of the NDRRMC later that same year. (click)
The onslaught of Super Typhoon Yolanda in November 2013 (click) drew international attention, as the then-strongest typhoon, in terms of wind speed, to make landfall in recorded history. This led to several agencies to draft a Joint Memorandum Circular (click) that states that the suitability of the site shall be based on the MGB’s Flood and Landslide Susceptibility Zonation (click) and the corresponding recommended actions. (click)
The onslaught of Super Typhoon Yolanda in November 2013 (click) drew international attention, as the then-strongest typhoon, in terms of wind speed, to make landfall in recorded history. This led to several agencies to draft a Joint Memorandum Circular (click) that states that the suitability of the site shall be based on the MGB’s Flood and Landslide Susceptibility Zonation (click) and the corresponding recommended actions. (click)
The direct beneficiaries of the outputs of bureau are the local government units. But in order for them to find value in our work, we must work tirelessly to reach them and streamline the ways our maps and reports are assimilated in their DRRM plans and programs. The Department of Interior and Local Government (DILG) has been of great help to us. Through the issuance of a 2015 Memorandum Circular (click) on mainstreaming Climate Change Adaptation and Mitigation and Disaster Risk Reduction or (CCAM-DDRR) in local development and planning, the DENR-MGB maps are advised to be used as base maps and reference, especially in the Comprehensive Land Use Plan. Furthermore (click), a 2021 advisory requires barangays (or villages) to utilize the DENR-MGB threat advisories in formulating or updating their contingency plans. Also, amidst the COVID-19 pandemic (click), we sought the aid of DILG to allow our assessment teams to push through with the field surveys of our regular projects, despite the raised level of community quarantine. (click)
These mechanisms allow DENR-MGB to effectively fulfill its mandate as a geological survey organization that strengthens policies with vital geoscientific information and cultivates a collaborative whole-of-nation approach to achieving disaster resilience. It is also clear to us as public servants that the scientific endeavor we pursue must be on par with our international counterparts, because that’s what the Filipino People deserve. So in our ways forward, (click)
We recently updated our road map for the various programs of our division. Although these are broad statements, what this basically tells you is that we will continue strive to improve and enhance our methodologies and products, making them more climate change-adaptive. Another aspect we want to strengthen is collaboration, not just with our current partners within the NDRRMC, but also to international organizations who share the same vision as DENR-MGB. We hope this webinar is just a start of a beautiful friendship. We would like to thank the World Community of Geological Surveys and the Global Earthquake Model for allowing us to share our experience. And we hope to gain your support in our three-phased road map. (click)
Thank you and have a good day!