



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



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Mechanisms that facilitate Geological Survey Organizations'
role in disaster and climate risk management

06 February 2023



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Department of Environment and Natural Resources MINES AND GEOSCIENCES BUREAU



Implements geosciences programs on geohazards, groundwater vulnerability and mineral resource exploration. It is the steward of the country's mineral resources and has direct charge in the administration and disposition of mineral lands and mineral resources and to undertake geological, mining, metallurgical, chemical and other research and mineral exploration surveys in the Philippines.

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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)

LANDS GEOLOGICAL SURVEY DIVISION



001: NATURAL RESOURCES SUSTAINABLY MANAGED

PROGRAM 2: Mineral Resources And Geosciences Development Program

- ✓ National Geologic Quadrangle Mapping Program
- ✓ National Mineral Reservation Program
- ✓ Mineral Resources Development Program
- ✓ Geological Laboratory Services

003: ADAPTIVE CAPACITIES OF HUMAN COMMUNITIES AND NATURAL SYSTEMS IMPROVED

PROGRAM 1: Geological Risk Reduction and Resiliency Program

- ✓ National Geohazard Assessment and Mapping Program
- ✓ National Groundwater Resource and Vulnerability Assessment Program

SUPPORT TO OPERATIONS

- ✓ Information Systems Management
- ✓ Coordination of National and International Linkages
- ✓ Research and Development

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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)



NATIONAL GEOHAZARD ASSESSMENT AND MAPPING PROGRAM

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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)...

OBJECTIVES

- ✓ To identify areas susceptible or vulnerable to various geologic hazards;
- ✓ To increase public awareness of natural hazards in order to mitigate the negative impacts and for more rational development, planning and disaster management



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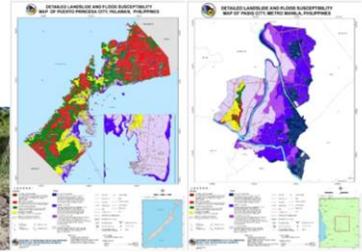
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The program has two main objectives. One of which is identifying which areas in the country are susceptible or vulnerable to various geologic hazards. And the other equally important objective is the public awareness component of the program, which aims to mitigate the negative impacts and for more rational development, planning, and disaster management. (click)

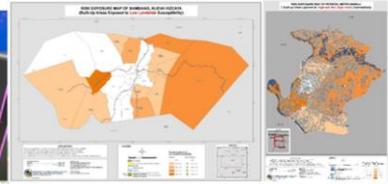
MAJOR ACTIVITIES



- ✓ Rain-Induced Landslide and Flood Susceptibility Assessment and Mapping



- ✓ Vulnerability and Risk Assessment



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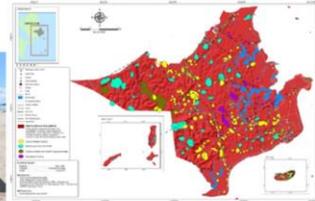
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First off is the susceptibility assessment and mapping of DENR-MGB's mandate – rain-induced landslide and flood hazards. This activity started off at a 1:50,000-scale and immediately followed by the more detailed 1:10,000-scale that concluded in 2014. 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. (click)

MAJOR ACTIVITIES



✓ Karst Subsidence Hazard Assessment



✓ Provincial- and Municipal/City-wide Information, Education, and Communication (IEC) Campaigns



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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 Campaign. 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)

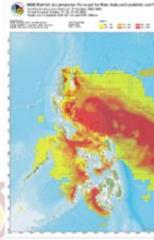
MAJOR ACTIVITIES



- ✓ Geohazard Operation Center for Early Warning System and Preparedness of Communities



MGB GEOHAZARD ADVISORY FOR TD "AGATON" AND TS "MALAKAS"



- ✓ Post-Disaster Assessment (suitability of temporary shelters, resettlement sites, evacuation centers)



Brgy. Villa Mag-aso, Baybay City
 Current geohazard map classified the site as having Moderate Landslide Susceptibility Rating. Due to the recent landslide events, the barangay should be re-classified as having Very High Landslide Susceptibility Rating.
 Engineering mitigating measures should be implemented along the roadside, and should also consider residences situated directly downslope of the site.
 With the threats of both landslide and flooding, Sitio Ban-ubod and Traves, must be immediately relocated.

Brgy. Bunga, Baybay City
 Based on the current geohazard map, the susceptibility ratings at the location of the recent landslide is having Moderate and High Susceptibility to Landslide. With the onslaught of Tropical Cyclone "Agaton" it is now re-classified as having Very High Landslide Susceptibility Rating. Because of this, it is not suitable for human settlement.

Brgy. Kantagnon, Baybay City
 The excessive rainfall brought by Tropical Cyclone "Agaton" causing the soil highly saturated that resulted to landslide on the coastline. The susceptibility ratings for Barangay Kantagnon from Low and Moderate Landslide Susceptibility will advance to Very High Landslide Susceptibility Rating. The area is not safe for human settlement.

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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)

MGB GEOHAZARD PORTAL

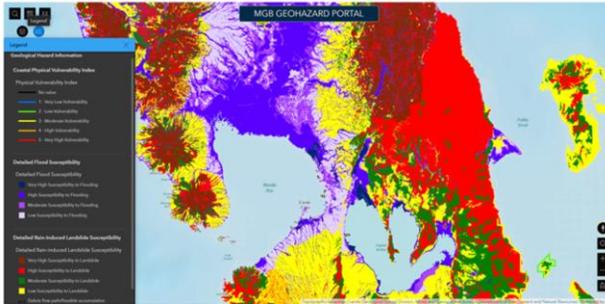
www.mgb.gov.ph



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report contains the most up-to-date information for the province about the threats posed by coastal hazards and the recommendations to mitigate or to minimize their effects on the populace.

Read more: MGSB Conducts Coastal Hazards Vulnerability Assessment of Camarines Norte Province



Quick Links



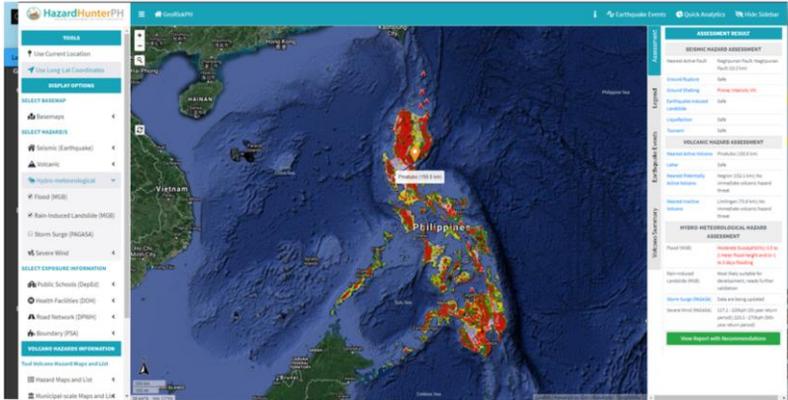
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role in disaster and climate risk management



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)

MGB GEOHAZARD PORTAL

hazardhunter.georisk.gov.ph



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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)



ENABLING MECHANISMS

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All these programs, projects, and activities of the bureau are made successful due to a variety of reasons. (click)

STRUCTURE **POLICY** **PARTNERS**

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GEM
GLOBAL EARTHQUAKE MODEL
Working together to assess risk

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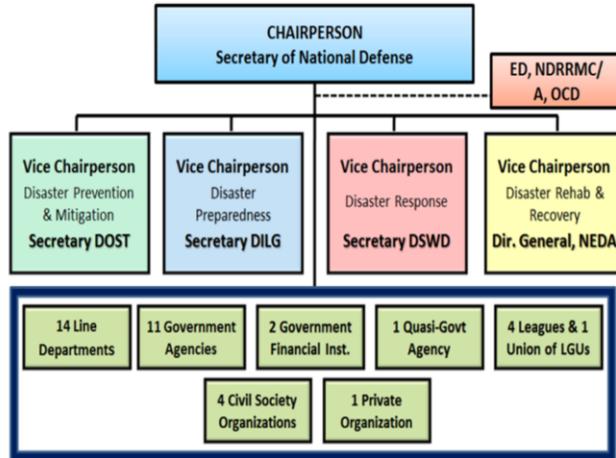
I have categorized the enabling mechanisms into three – institutionalized structures in place, science-informed policies and reforms, and the robust partnership with other agencies and the local government. (click)

STRUCTURE



Members: 39

- 14 Depts: DOH, DENR, DA, DepEd, DOE, DOF, DTI, DOTC, DBM, DPWH, DFA, DOJ, DOLE & DOT
- 12 gov't agencies: OES OPAPP, CHED AEP, PNP, OPS, NAPC, PCW, HUDCC, CCC, PHILHEALTH & OCD
- 2 Gov Financial Inst (GSIS & SSS)
- 1 Quasi-government agency (PRC)
- 5 LGU Leagues
- 4 Civil Society Organizations
- 1 Private Sector Organization



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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. (click)

STRUCTURE

Pre-Disaster Risk Assessment

2014



REPUBLIC OF THE PHILIPPINES
NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL
National Disaster Risk Reduction and Management Center, Camp General Emilio Aguinaldo, Quezon City, Philippines

MEMORANDUM
No. **17**, s. 2014

TO : ALL CONCERNED
SUBJECT : Institutionalization of the Pre-Disaster Risk Assessment (PDRA)
DATE : AUG 18 2014

1. References: Republic Act 10121
- 1.1. Section 2, items (k) and (l) to recognize the local risk pattern across the country and strengthen the capacities of communities and LGU for DRR, specifically on mitigating and preparing for, responding to and recovering from the impact of disasters.
 - 1.2. Section 6, item (i) develop assessment tools on the existing and potential hazards and risks brought about by climate change

Department of Environment and Natural Resources to include MGB and NAMRIA
Office of Civil Defense

As members of the PDRA Core Team, abovementioned members are directed to organize and may wish to call on other NDRRMC member-agencies and organization to facilitate the immediate execution of needed assessment and dissemination of results, as deemed necessary.

2021



REPUBLIC OF THE PHILIPPINES
NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL
National Disaster Risk Reduction and Management Center, Camp Aguinaldo, Quezon City, Philippines

MEMORANDUM CIRCULAR
No. **65**, s. 2021

JUN 29 2021

TO : ALL MEMBER AGENCIES AND OFFICES OF THE DISASTER RISK REDUCTION AND MANAGEMENT COUNCILS AT THE NATIONAL, REGIONAL AND LOCAL LEVELS
SUBJECT : AMENDED GUIDELINES ON THE CONDUCT OF PRE-DISASTER RISK ASSESSMENT (PDRA)

NATIONAL	REGIONAL ¹	LOCAL
OCD (Lead) DILG DSWD Relevant warning agencies or technical agencies such as: • DOST-PHIVOLCS • DOST-PAGASA • DENR-MGB • Other national agencies with expertise on the hazard	OCD RO (Lead) DILG RO DSWD RO Relevant warning agencies or technical agencies such as: • DOST-PHIVOLCS Field Office • DOST-PAGASA Field Office • DENR-MGB RO • Other regional agencies with expertise on the hazard	LDRRMO (Lead) Local Social Welfare Office (LSWO) Local Government Operations Office (LGOO) Relevant warning agencies or technical agencies operating at the local level

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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)

POLICY

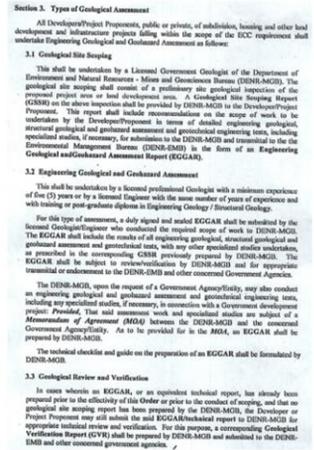
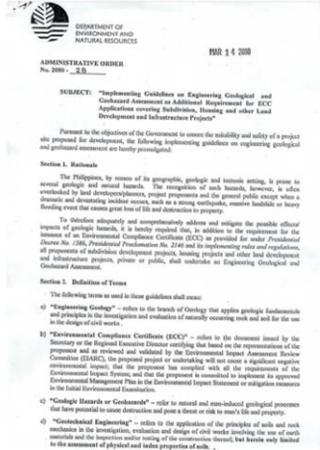
1999

2000

Cherry Hills Subdivision Landslide in August 1999



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Moving on to policies. Landmark policy reforms often resulted from historical disastrous hazard events. (click) Following the Cherry Hills Subdivision Landslide in August 1999, the DENR issued an Administrative Order in 2000 (click), 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. (click)

POLICY

1999

2000

2009

2010

Tropical Storm ONDOY (I.N. KETSANA) in September 2009



Angono, Rizal -
September 29, 2009
(JAY
DIRECTO/AFP/Getty
Images)

S. No. 1082
19 July 2009

Republic of the Philippines
Congress of the Philippines
Metro Manila
Ninety-fourth Congress
Third Regular Session

Began and held in Metro Manila, on Monday, the twenty-seventh
day of July, two thousand nine.

REPUBLIC ACT NO. 10121

AN ACT STRENGTHENING THE PHILIPPINE DISASTER
RISK REDUCTION AND MANAGEMENT SYSTEM,
PROVIDING FOR THE NATIONAL DISASTER RISK
REDUCTION AND MANAGEMENT FRAMEWORK,
AND INSTITUTIONALIZING THE NATIONAL
DISASTER RISK REDUCTION AND MANAGEMENT
PLAN, APPROPRIATING FUNDS THEREFOR AND
FOR OTHER PURPOSES

Be it enacted by the Senate and House of Representatives
of the Philippines in Congress assembled

SECTION 1. Title. - This Act shall be known as the
"Philippine Disaster Risk Reduction and Management Act of
2010".



REPUBLIC OF THE PHILIPPINES
NATIONAL DISASTER COORDINATING COUNCIL
National Disaster Management Center, Camp General Emilio Aguinaldo, Quezon City, Philippines

IMPLEMENTING RULES AND REGULATIONS OF REPUBLIC ACT NO. 10121, ALSO
KNOWN AS THE ACT STRENGTHENING THE PHILIPPINE DISASTER RISK
REDUCTION AND MANAGEMENT SYSTEM, PROVIDING FOR THE NATIONAL
DISASTER RISK REDUCTION AND MANAGEMENT FRAMEWORK AND
INSTITUTIONALIZING THE NATIONAL DISASTER RISK REDUCTION AND
MANAGEMENT PLAN, APPROPRIATING FUNDS THEREFOR AND FOR OTHER
PURPOSES*

RULE 1 - GENERAL PROVISIONS

Section 1. Title. - These Rules shall be known and cited as the Implementing Rules and
Regulations of Republic Act No. 10121, also known as the Philippine Disaster Risk Reduction
and Management Act of 2010 (DRRM Act of 2010).

Section 2. Purpose. - These Rules are hereby promulgated to prescribe the manner,
provisions and guidelines for the implementation of the DRRM Act of 2010, to facilitate
compliance therewith, and achieve the objectives thereof.

Section 3. Declaration of Policy. - It is the policy of the State to:

- 1) Uphold the people's constitutional rights to life and property by addressing the root
causes of disasters to maximize the country's institutional capacity
for disaster risk reduction and management, and building the resilience of local
communities to disasters including climate change impacts;
- 2) Adhere to and adopt the universal norms, principles, and standards of humanitarian
assistance such as the International Declaration of Human Rights, the United Nations
Guidelines on Internal Displacement and Durban Solutions, Convention on the Rights of
the Child and the global effort on risk reduction as concrete expressions of the country's
commitment to mitigate human suffering due to recurring disasters;
- 3) Incorporate intergenerational justice and principles of disaster risk
management in the creation and implementation of national, regional and local
sustainable development and poverty reduction strategies, policies, plans and budgets;
- 4) Adopt a disaster risk reduction and management approach that is holistic,
comprehensive, integrated, and disaster or disaster risk management and
environmental impacts of disasters including climate change, and promote the
ownership and participation of all stakeholders involved, at all
levels, including the local government;
- 5) Strengthen, promote, and institutionalize a comprehensive National Disaster Risk Reduction
and Management Plan (NDRRMP) that aims to strengthen the capacity of the national
government and the local government units (LGUs), together with partner
organizations, to build the disaster resilience of communities, and with partner
organizations and resources for reducing disaster risks, including potential climate
risks, and enhancing disaster preparedness and response capacities at all levels.

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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)

POLICY



1999 2000 2009 2010 2013 2014

Joint DENR-DILG-DND-DPWH-DOST Memorandum Circular No. 2014-01

SUPER TYPHOON YOLANDA (I.N. HAIYAN) in November 2013



Tacloban, Leyte
November 10, 2013
(Manila Bulletin/ Bullit Marquez)

Flood Susceptibility	Suitability of Site
Low	May be suitable for dwelling and development provided possible flood heights and structural integrity are considered in the design; May be suitable for evacuation centers provided these are structurally sound and have vertical evacuation capabilities.
Moderate	May be suitable for dwelling and development provided possible flood heights and structural integrity are considered in the design; Not suitable for evacuation centers.
High to Very High	Not suitable for commercial, industrial, residential and institutional developments; Not suitable for evacuation centers; May be suitable for recreational areas such as parks, etc. provided possible flood heights are considered in the design.

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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)

POLICY



1999 2000 2009 2010 2013 2014

Joint DENR-DILG-DND-DPWH-
DOST Memorandum Circular No.
2014-01

SUPER TYPHOON YOLANDA (I.N. HAIYAN) in November 2013



Tacloban, Leyte
November 10, 2013
(Manila Bulletin/ Bullit Marquez)

Landslide Susceptibility	Suitability of Site
Low	May be suitable for dwelling and development provided continuous monitoring of the slope is conducted; May be suitable for evacuation centers provided appropriate engineering intervention measures are implemented with continuous monitoring.
Moderate	May be suitable for dwelling and development provided appropriate engineering intervention measures are implemented with continuous monitoring; Not suitable for evacuation centers.
High to Very High	Not suitable dwelling; Not suitable for evacuation centers; May be suitable for critical facilities provided that appropriate engineering intervention measures are implemented with continuous monitoring.

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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](#))

PARTNERS



MAP

MEMORANDUM CIRCULAR
NO. 2011-22

July 21, 2011

FOR : ALL PROVINCIAL GOVERNORS, CITY AND MUNICIPAL MAYORS, CITY/MUNICIPAL PLANNING AND DEVELOPMENT COORDINATORS, DILG REGIONAL, PROVINCIAL AND CITY DIRECTORS, CITY/MUNICIPAL LOCAL GOVERNMENT OPERATIONS OFFICERS AND OTHERS CONCERNED

SUBJECT : GUIDELINES ON MAINTAINING CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION IN LOCAL DEVELOPMENT PLANNING

3.2.2. CCA-DRR-Specific Requirements and References

3.2.2.1. Maps (Base/Land Use Maps, Hazard/Risk Maps)

Maintaining DRR and CCA in the planning process will not be effectively carried out in the absence of base maps, land use maps, hazard maps and risk maps. The base and land use maps illustrate location of both and subcell environments. Overlaid with hazard maps, these will indicate which areas are at risk. These maps are very important in defining development patterns or direction, determining vulnerabilities and adaptive capacities, identification and design of appropriate programs, projects and activities, and as basis for declaration of safe, no-building and no-build zones.

LGU's are therefore advised to do the following:

- Secure base maps from NAMRIA
- Make available or prepare their land use maps
- Secure hazard maps for all hazards in the locality from:
 - 1) DOST-PALCEA for hydro-meteorological hazards;
 - 2) DOST-NAMRI and DREAM (DRI LEDAR) for high-volcanic hydrometeorological hazards in both print, online and KMZ formats
 - 3) DOST-PIVOCES for geological hazards.
- **DENR-MGB for base, risk, hazard, landslide and seismic hazard maps**
- NAMRIA for aerial hazard maps under READY project and multi-hazard maps (i.e., flood, landslide and storm surge) of vulnerable affected LGUs.

THREAT ADVISORY

ADVISORY

TO : ALL PUNONG BARANGAYS, BARANGAY DISASTER RISK REDUCTION AND MANAGEMENT COMMITTEES, BARRM MINISTER OF LOCAL GOVERNMENT, DILG REGIONAL, PROVINCIAL AND CITY DIRECTORS, CITY/MUNICIPAL LOCAL GOVERNMENT OPERATIONS OFFICERS, AND OTHERS CONCERNED

SUBJECT : UTILIZATION OF MINES AND GEOSCIENCES BUREAU'S GEOHAZARD THREAT ADVISORIES IN FORMULATING OR UPDATING OF CONTINGENCY PLANS OF THE BARANGAYS

DATE : 09 MARCH 2021

Pursuant to Republic Act No. 7160 or the Local Government Code of 1991, the local government units are mandated to adopt measures and protect their inhabitants from the harmful effects of man-made or natural disasters. Relatedly, Republic Act No. 10121, also known as the Philippine Disaster Risk Reduction and Management Act of 2010, mandates local government units to conduct contingency planning activities.

Past experiences proved that preparing conscientiously for disasters can substantially minimize loss and damages from natural hazards. Hence, in a disaster-prone country like the Philippines, the importance of contingency planning to come up with timely, effective and appropriate response measures cannot be overemphasized.

FIELD SURVEY

September 21, 2020

ATTY. WILFREDO G. MONCANO
Acting Director
Bureau of Geosciences and Mineral Resources
Department of Environment and Natural Resources
North Avenue, Diliman - Quezon City

Dear Atty. Monsano:

This has reference to your letter to Honorable Eduardo M. Abo, Secretary, Department of the Interior and Local Government pertaining to the personnel of Department of Science and Technology - Philippine Institute of Volcanology and Seismology (DOST-PIVOCES) and Department of Environment and Natural Resources - Mines and Geosciences Bureau (DENR-MGB) who will conduct Geological Assessment and related Disaster Risk Reduction and Management Activity.

Please be informed that personnel of PIVOCES and DENR-MGB are already included in the APOCR list under General Community Quarantine being classified under the category of scientific and research development (see attached). Hence, they are allowed to leave through the established Quarantine Control Points provided that their travel is for business or work related. However, they shall be subjected to existing regulations on monitoring and inspection of health conditions.

Thank you and rest assured of the commitment of the PNP on matters of mutual concern.

Very truly yours,
ALFRED B. COPUS
Police Major General
The Director for Operations

Chief, Forward Command Group

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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)



WAYS FORWARD

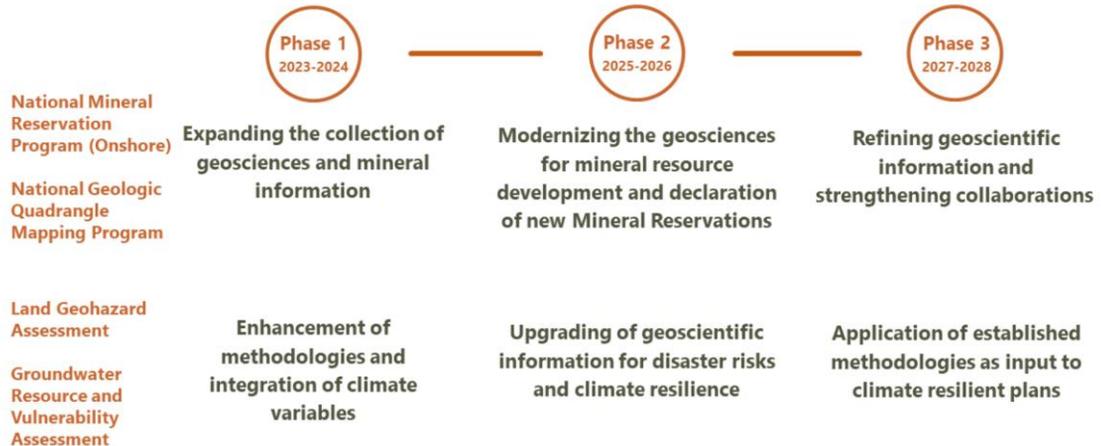
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These mechanisms allow DENR-MGB to effectively fulfill its mandate as a geological survey organization that strengthens policies with vital geoscientific information and cultivates a collaborative whole-of-nation approach to achieving disaster resilience. 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)

WAYS FORWARD



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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!

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WCOGS-GEM Virtual Webinar Part I: The Enablers
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World Community
of Geological Surveys

Thank you and have a good day!