



ANDAM LAHAR

Preparedness Module for Rain-Induced Lahar



The Cover

Mayon Volcano is a picture of calm on clear blue sky weather. Beneath the beautiful exterior lies a number of potential hazards that may affect the surrounding municipalities and communities in the province of Albay. Appropriately, risk anticipation activities are conducted on blue sky days. It is the most suitable time to mitigate, prepare and organize the whole of society to lessen or prevent potential impacts that may cause disaster on gray sky days.

ANDAM LAHAR

Anticipation Action for Lahar Risks

Preparedness Module for Rain-Induced Lahar



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PREFACE

On 13 January 2018, The Philippine Institute of Volcanology and Seismology (PHIVOLCS) reported a phreatic or stream-driven ash eruption from the Mayon Volcano, followed by regular pyroclastic flow of fragments, ash and volcanic gas, lava collapses, rock falls and volcanic earthquakes. After the eruption, there is an estimated 13 million cubic centimeters of potential lahar elements, the newly extruded volcanic material can be mobilized by approximately 25 to 30 millimeters of rain for three (3) hours while 60 millimeters of torrential rains could push down old debris. Considering that Albay is largely along the path of most typhoons, the likelihood of lahar flow occurring during the rainy season is very high.

Bicol Region is historically the entry point of tropical cyclones in the Philippines due to the country's location in the Pacific typhoon belt and Bicol's location near the Pacific Ocean making it susceptible to hydrometeorological hazards (rain that can trigger lahar). The southwest monsoon, on the other hand, brings torrential rains from May to October and could even cause flooding in the region that could trigger lahar.

Lahar can potentially displace up to 90,000 residents from nine municipalities and two cities. Barangays from low lying areas and communities along river channels are at risk of inundation or overflowing of large segments of lahar and washout or erosion of land surfaces due to the sudden downpour of lahar. Trees, roads, infrastructure can be buried under several meters of lahar flows. Continuous and strong rain can wash away ash and heavy rock deposits and boulders coming from volcanic eruptions including old rock deposits can be mobilized along river streams and river channels. Lahar can affect major river systems and drainages and can trigger landslides, siltation (pollution of water systems) and excessive soil erosion from the pyroclastic and ash flows in the upper-to-middle slopes of Mayon Volcano. Greatest lahar flow can consequently be faced by communities along river channels such as of Daraga, Camalig, Santo Domingo, Guinobatan, Malilipot, Legazpi City, Tabaco City (Albay) and Ligao City.

Further lahar-related flowing, washout and siltation can subsequently occur along the Yawa River. People living in these communities risk injuries and mass casualty along with the destruction of markets, roads, livelihoods and critical facilities. In Barangays Ilawod, Lidong and Salvacion more than 8,000 residents will be directly affected through possible mass casualties and injuries if warning protocols and evacuation procedures do not happen efficiently and effectively.

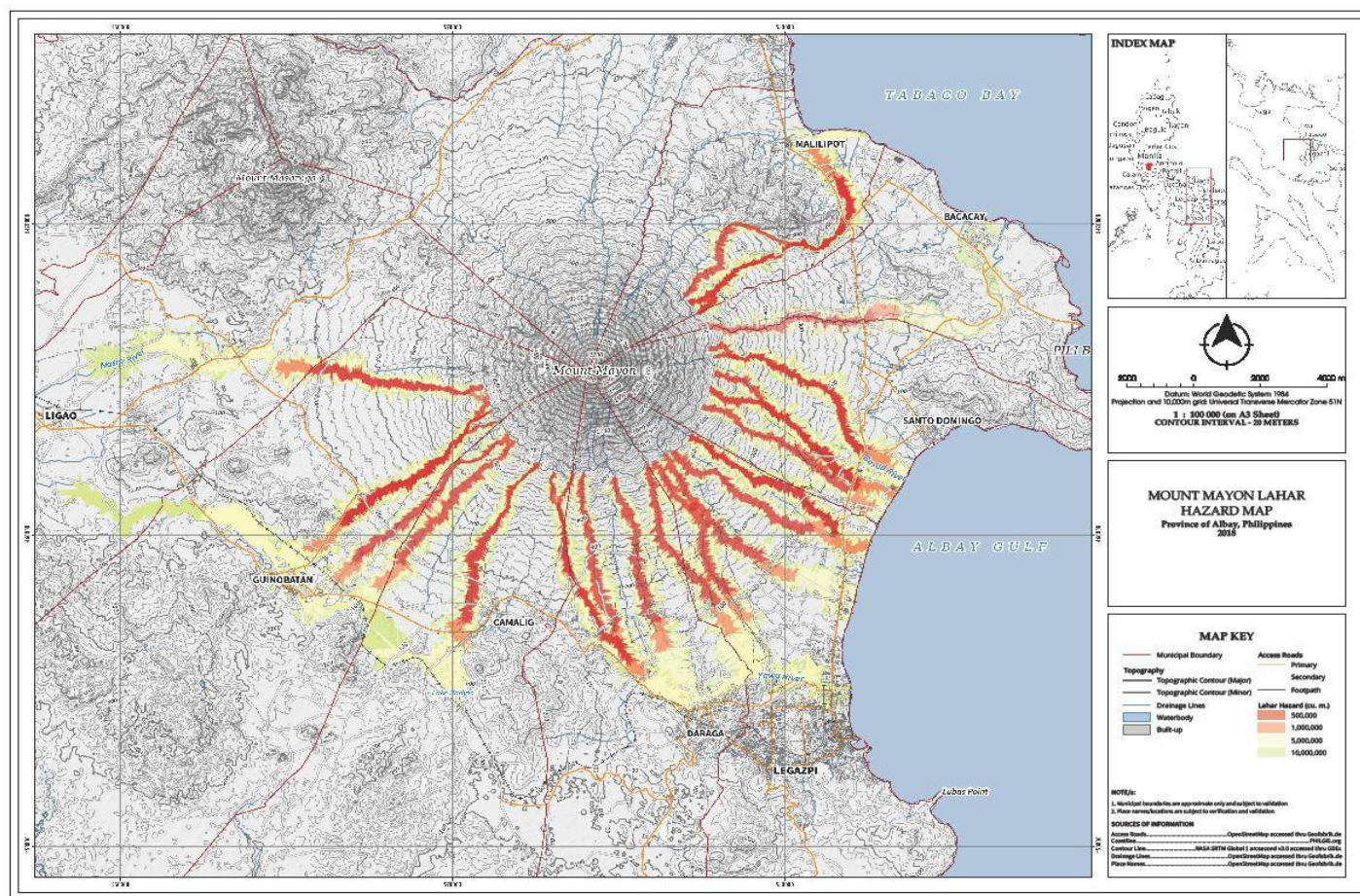


Fig. 1 Mount Mayon Lahar Hazard Map covering the entire province of Albay

Coming from the Lahar Analysis for Action Study, these three barangays were selected, prioritized and recommended by APSEMO and PHIVOLCS (Philippine Institute of Volcanology and Seismology) due to the existing information that these three barangays are the most susceptible to lahar hazards due to their location and categorization as significantly or highly exposed to potential lahar but are not considered completely exposed to lahar (areas completely covered, or in the permanent danger zone were not considered due to their obvious risks) in strengthening their capacity to respond and cope with possible lahar risks through the utilisation of relevant, updated, scientifically-supported and community-validated information. The availability of such information is crucial in the planning and budgeting process of local governments as it provides finer details on risk situation, evacuation plans and overall contingency planning actions.

The project will address the need to strengthen preparedness capacity by providing technical support and training on lahar risk anticipation and contingency/disaster preparedness planning utilising the latest and most accurate volcano slope study. This would include further data analysis, scenario development, and set up of protocols. Technical trainings will be integrated with Core Humanitarian and Inclusion Standards to ensure programming that is of good quality, high accountability and is able to accommodate the needs of vulnerable groups. Tools and equipment will also be part of the support which will hasten local risk monitoring capacity and warning systems that are mindful of contexts.

On May 3, 2019, Christian Aid, along with Humanity & Inclusion and CARE Philippines, were awarded funding for a crisis anticipatory project on volcanic mudflow (lahar) of Mayon. This project will support the provincial, municipal and barangay DRR authorities together with CSOs in developing preparedness measures for potential lahar risks in the target communities. The project aims to proactively respond to the increasing lahar risks in the pilot areas (Municipality of Daraga Barangay Salvacion, Municipality of Camalig Barangay Ilawod, Municipality of Santo Domingo Barangay Lidong) that were assessed during the analysis for action study. The project was given a localized name called Andam Lahar. Andam is Bicolano term for ready.

The lahar preparedness module includes early warning system, scenario development, protocols (communication and evacuation) developed by APSEMO and reinforced by topics showing the organizational strength of the consortium in inclusion and humanitarian standards.

The module will be downloaded to Municipal DRRMCs by DRRM specialists including APSEMO, PHIVOLCS, PAGASA and other provincial authorities along with the consortium and local CSO partners of this project. Trained Municipal DRRM representatives will support the downloading of the module to BDRRMCs. In all the downloading activities, the lahar module will be adapted to the context of the community and DRRMC.

The development of the lahar preparedness module was facilitated by Christian Aid and co-led by APSEMO together with the consortium partners Humanity & Inclusion (HI), CARE and local CSO partners Simon of Cyrene, Coalition of Bicol Development, Tarabang para sa Bicol Inc. (TABI), and Citizens' Disaster Response Center Foundation Inc. (CDRC).

The module along with other related documents and inclusive IEC materials shall support the transfer of skills and knowledge and serve as a model that can be adapted by other communities threatened by lahar risks.

ACKNOWLEDGEMENTS

We would like to express our gratitude for the valuable support of the following officials, government agencies, partner organizations and communities for the development of this module and successful implementation of Andam Lahar in the Province of Albay.

Our local implementing partners:

Coalition for Bicol Development (CBD), Citizens' Disaster Response Center Foundation, Inc. (CDRC) and Tarabang para sa Bicol (TABI), and Simon of Cyrene Community Rehabilitation and Development Foundation, Inc. (SCCRDFI)

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Mr. Alex Comia, MDRRMO, Daraga, Albay

Mr. Justo Lumaban, Barangay Chairperson, Salvacion, Daraga, Albay

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Ms. Lelia Balla, Barangay Chairperson, Lidong, Sto. Domingo, Albay

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SUMMARY OF CONTENTS

This module is particular to lahar risk scenarios and anticipation actions. The following module sessions and activities refer to pre-disaster activities that start from a normal situation to near real-time warning system (from the first receipt of warning information from PAGASA and Phivolcs, to the advisory from APSEMO), contingency planning, and ends when the evacuation procedure is completed. It only covers prevention and preparedness and discourages rescue and response, as topmost priorities, to adhere to the province's zero casualty goal.

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MODULE 2: Warning Systems & Communication Protocols Session 1 Weather Systems Session 2 Real-time Warning Systems Session 3 Communication Protocols (Rights, Roles and Responsibilities to Access Information) & Warning System Advisories Session 4 Tips on How to Handle Disability, Gender, Age
MODULE 3: Evacuation Planning Session 1 APSEMO Evacuation Protocols Session 2 Inclusive Evacuation
MODULE 4: Scenario-based Contingency Planning & Table top Exercise Session 1 Lahar Risk Contingency Planning Session 2 Inclusive Contingency Planning Session 3 Tabletop Exercise
MODULE 5: Local Disaster Governance & Core Humanitarian Standards Session 1 Local Disaster Governance Session 2 Core Humanitarian Standards
MODULE 6: Simulation Exercise

The early warning system criteria, communication and evacuation protocols, and other processes are based on existing evidence and evidence-based practice of APSEMO that is reiterated in the this module.

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INTRODUCTION

Purpose and Scope

This lahar preparedness module aims to serve as a guide for municipal and barangay council members to create their own lahar preparedness plan or as a supplement in the development of their lahar contingency plans or operational module.

In particular, it shall:

1. Successfully integrate community knowledge and scientific information to create better risk information for the 3 pilot municipalities and 3 barangays as basis for their lahar preparedness operations manual;
2. Enhance existing operations manual and contingency plans to improve the following components customized for lahar preparedness:
 - Risk assessment
 - Early warning system
 - Evacuation protocols
 - Communication protocols
 - Organization procedures
 - Role of each team and committee
 - Activation of the incident command system (ICS)/BDRRMC
3. Integrate Core Humanitarian Standards; Humanitarian & Inclusion Standards; and Gender, Age and Disability in the LGUs' or barangays' lahar preparedness operations manual;
4. Incorporate inclusive IEC materials on lahar preparedness to complement the sessions; support the transfer of skills and knowledge; and serve as a reference for other areas not covered by the project.

Target Users

The lahar preparedness module was developed for members of the City/Municipal/Barangay Disaster Risk Reduction and Management Council/Office and disaster risk reduction practitioners in lahar-prone cities, municipalities, and communities who are tasked to create their own lahar preparedness and contingency plans.

Training Methods

Instructors/Facilitators – resource persons from APSEMO, Phivolcs, and PAGASA must be informed at least two weeks earlier. Sessions such as The Science of Lahar, Weather System, and Warning System must only be taught by technical experts from these agencies. For full context and appreciation, a resource person for Core Humanitarian Standards can be requested among the pool of trainers by Christian Aid, specifically from your area.

Inclusion (gender, age and disability)-focused sessions can be taught by inclusion experts from organizations that specialize in this subject such as Humanity & Inclusion (HI) and Simon of Cyrene in Albay province; disabled people's organization (DPO), local Persons with disabilities Affairs Office (PDAO), parent group organizations, NGOs providing support to persons with disabilities, older people and gender, and leader with disability.

The rest of the sessions in the module, preferably, should be taught by experienced DRR practitioners or trained DRR officers who understand the full context, risks, and exposure to lahar and other hazards of the communities.

Keep in mind that:

Be prepared to be flexible. If things go differently than planned, discuss and make joint decisions on how to improvise and adapt. Co-facilitation is a valuable asset during training. The co-facilitator can support by observing how the participants react, and can provide valuable support such as, including audio describing dynamics, documenting and instruction and clarification support. Finally, be time sensitive, as the span of concentration is different from one person to another. In addition time for sign interpretation or other communication assistance needs to be factored in to allow everyone to keep a pace of discussions/ content.

Note to the facilitator/s ensure the following:

Attention to needs: We apply what we have learned more easily, if what we take on board in a workshop relates to the problems or a certain issues that are of interest to us.

Participation: Any training process which involves participation increases individual motivation and capacity to learn (it is advisable to hire sign language interpreter, their caregivers or expert on inclusion to make training more inclusive) so the training is more effective if we have the opportunity to learn through our actions.

Visualization: Creating visual examples of proposals, discussions and agreements that come up in a workshop, makes it easier to participate and focus on fulfilling needs.

Presentations: The sessions will be taught primarily using PowerPoint presentations. In case of a power interruption and venue challenges, alternative teaching materials must be prepared such as flipcharts and a whiteboard. For a more inclusive presentation, refer to this module's Inclusive Facilitation Considerations.

Activity Materials: Instructors or resource persons are encouraged to prepare manila papers, metacards, tapes, board and markers for the workshops. The inclusion-focused sessions may require assistive devices. Other materials that have to be prepared in advance will be stated in the session or activity.

Social Preparations

Before conducting the training, the facilitator/s or project implementers must have accomplished the following:

Activity	Objectives/Expected outcomes
Municipal and Barangay Meeting	<ul style="list-style-type: none">• Project/activity briefing• Expectation setting for municipal and barangay level• Identifying new members of the barangay/municipal DRR council and their exposure to DRR activities• Ensure participation from PDAO or DPO leaders
Data Gathering	<ul style="list-style-type: none">• Gathering of baseline and disaggregated data from municipality and barangay – ensure local CSO like women’s group, older persons, youth and children’s group, single parents, persons with disabilities etc.• Gathering of maps• PAG-ASA Records/Data• DRR Plan – Municipality, Barangay• Existing early warning system
Ocular visit	<ul style="list-style-type: none">• Identify which parts barangay should be prioritized• Meet community members and individuals
Courtesy to Barangay Leaders	<ul style="list-style-type: none">• Project briefing• Expectation setting with training participants• Pre-selection of who will share their experiences – well represented sectors

Inclusive Facilitation Considerations

Prior to the conduct of the module activities, the facilitator/speaker must ensure the full participation of all individuals – with or without disabilities – before, during and after the training. The following inclusive facilitation considerations:

Before:

- Ask presenters to provide materials before the meeting to allow for alternative formats to be created such as a printed copy of presentation or in USB drive. Brief presenters on speaking to a multilingual audience that includes those who use sign language or those who do not speak English as their first language. They should be prepared to speak slowly and describe any images shown during their presentation
- Sign language interpreter and or family members/friends during the training and session. If not sign language you may coordinate with Special Education (SPED) teachers to support the session
- Make sure that information before the actual activity should be made available to give time to sign language interpreters, personal assistants and persons with disabilities to be oriented with the topic ahead of time to build confidence and encourage the participants to attend and to give time to prepare
- Video should have captioning

- Prepare pen and paper including handouts
- Think about the speed, clarity, volume of session speaker
- For older persons respectfully direct them when they share long stories or when they veer away from the topic
- Remind/orient the participants regarding the use and protocols for assistive devices before the simulation

During:

- Use creative way to introduce the session for example by printing drawing of different ways of communication
- For persons with visual disability ensure to avoid using pronouns he/she/there/here instead use the name of the person and give specific directions;
- Make sure to provide detailed verbal information when presenting to persons with visual disabilities, make soft copies of files in advance before meetings/activities in word format readable by software applications for persons with visual disabilities, make sure to orient the person of new surroundings (where the washroom facilities are, where are exit doors, where is the speaker and the location of the speaker during a meeting); provide budget for one additional person (personal assistant)
- Ensure reading buddies for the initial part of the session as needed and audio descriptions for people who have difficulty reading
- Ensure room setup allows space for wheelchair access, that sign language interpreters are well positioned to be seen and that there is audio description of any visual materials and PowerPoint contents
- Ensure that wheelchair users and those with visual impairments will be able to navigate around the room. For example, allow for ample room between tables, make sure that there are no wires on the floor or that they are taped down. Remove some chairs from tables to create space for wheelchairs.
- For persons with intellectual disability make sure to add budget for a personal assistant or family member who can provide support in transferring of information
- The facilitator should not speak too quickly or pace the discussion not too quickly, so that persons with disabilities, older persons, sign language interpreters and personal assistants have time to provide interpretation or to provide time to transfer/communicate the information
- Try to avoid using lengthy formal presentations, make use of visual, auditory and kinesthetic learning styles. Keep it varied and use different methods. To allow for people to take some time for themselves during the training. Be creative with sensitivity to the needs of all participants

After:

- Provide accessible travel arrangements; people can only participate in a meeting or event if they can actually go to and from the place

MODULE 1: Community Sharing: Our Story and the Science of Lahar and Other Volcanic Hazards

Description

The session aims to engage the community through the sharing of local experiences about lahar and strengthen the local context of lahar within the surrounding municipalities of Mayon Volcano. This will highlight the importance of the entire course for stakeholders and its need to be context specific and community-based.

Phivolcs defines lahars (an Indonesian term) also called volcanic mudflows or debris flows, are slurries of volcanic sediment, debris and water that cascade down a volcano's slopes through rivers and channels. Lahars in tropical areas are mainly generated by torrential rainfall on unconsolidated deposits from a past eruption. These can also be triggered by the sudden draining of a crater lake or a collapsed natural or man-made dam or the movement of a PDC into a river or lake and eventual mixing with water.

The Science of Lahar session will also provide the participants scientific knowledge and background on how volcanoes are formed, the hazards associated with volcanoes, and how Phivolcs, the country's premier geologic agency, monitor, communicate and disseminate volcanic hazard warnings.

Key Message

We want communities to have higher appreciation of their local experience regarding lahar. This session will also recognize the current knowledge, skills, and attitude of communities and municipalities towards lahar to contribute to the creation of local and indigenous EWS and context-specific contingency plans. Having this at the beginning will allow the next sessions to be grounded on community experience. Integrating scientific knowledge to community knowledge will provide the communities a better and a more informed understanding on the volcanic hazards, in particular, lahar, and how to prepare for it.

Objectives

1. To know the context and current community knowledge of Lahar per barangay
2. To understand previous experiences of community members regarding Lahar
3. To build the disaster timeline (with focus in Lahar) of the barangay
4. To have basic knowledge on volcanoes and its associated hazards
5. To understand the components of lahar and its impact as a volcanic hazard to at-risk communities

Learning Outcomes

At the end of the session:

- Participants will be able to create a Disaster Timeline
- Participants will be able to identify good practices in preparation and evacuation for Lahar
- Participants will be able to integrate scientific knowledge and community knowledge on lahar in creating their lahar preparedness plan

Reference

Phivolcs IEC Materials on Volcanoes and Volcanic Hazards

Retrieved from <https://www.phivolcs.dost.gov.ph/index.php/volcano-hazard/introduction-to-volcanoes>

Session 1: Pagkukwento

Introduction

This session will encourage the participants to share their lahar experiences by recalling past events and how they prepared, responded, and affected by lahar hazards. Participants will share their best practices and lessons learned from these experiences to inform their present lahar planning and preparedness activities in their communities.

Activity

This activity will help layout lahar timeline in the area. The participants will be grouped according to barangays or LGU.

The facilitator will hand out metacards to identify the following:

1. Year Lahar Happened
2. What happened on the onslaught of lahar?
3. Characteristics of lahar during that period

In a manila paper, create a table with columns representing the description above. Afterwards, they may post it in the manila paper .

Buwan/Taon (Year Lahar happened)	Anong nangyari sa panahon ng lahar? (What happened on the onslaught of lahar?)	Katangian ng lahar sa panahong ito. (Characteristics of lahar during that period)

Table 1. Matrix to guide the participants in creating a lahar disaster timeline and narrate their experiences.

The facilitator should use the output of the previous activity as take off point to recall the experiences during a lahar event.

To better understand the context of lahar, experiences of pre-grouped community members will be shared through a tableau or role play.

Their story must answer the following questions:

1. What happened during lahar? What did they see? When did this happen?
2. How did they feel when it happened?
3. What did they do to address the situation?
4. What did they learn from the situation?

For a more motivated performance, prepare a prize for the best interpretation.

Synthesis

Assign a group representative to report on the group's answer or output.

Identify the frequency and patterns of lahar in the barangay. Identify the affected population, area, damages to livelihood and infrastructure, and casualties. The outputs from the participants should illustrate the severity of damages and possible interventions; their actual experience, knowledge and lessons learned from the community regarding lahar.

What steps were effective and efficient to the community? Identify the good practices that they can refer to during the training and planning process. The outputs must be displayed during the entire training for reference.

PAG-ASA, Phivolcs, or the local MDRRMO can validate the data and add other relevant information about Lahar in the specific area.

Session 2: Science of Lahar

Introduction

After sharing the community knowledge and experiences, this session by Phivolcs will provide more information and scientific knowledge on lahar and other volcanic hazards. Community and scientific knowledge are important in developing a community-based real-time early warning system. This session will focus on volcano hazards, primarily lahar, and its impact to the environment and communities.

The premier warning agency on geologic hazards, Philippine Institute of Volcanology and Seismology (Phivolcs) is mandated by the government to conduct:

- Volcano monitoring and warning
- Geologic hazards and risk assessment
- Evaluation of earthquake and volcano eruption potential
- Public awareness, community preparedness, disaster risk reduction

Phivolcs focuses on geologic phenomena such as earthquakes, tsunamis, volcanic eruptions and related phenomena (ex. Landslides)

Key Concepts

Formation of a Volcano

The term VOLCANO signifies a vent, hill or mountain from which molten or hot rocks with gaseous materials are ejected. The term also applies to craters, hills or mountains formed by removal of pre-existing materials or by accumulation of ejected materials.

The Philippines sits on a unique tectonic setting ideal to volcanism and earthquake activity. It is situated at the boundaries of two tectonic plates – the Philippine Sea Plate and the Eurasian plate – both of which subduct or dive beneath the archipelago along the deep trenches along its east and west seaboard.

Volcanic eruption

A process wherein molten rock materials are emitted/ejected in the form of flowing masses, discrete particles and steam from a crater, vent or fissure.

What causes a volcano to erupt?

- Changes in pressure and temperature in the magma chamber

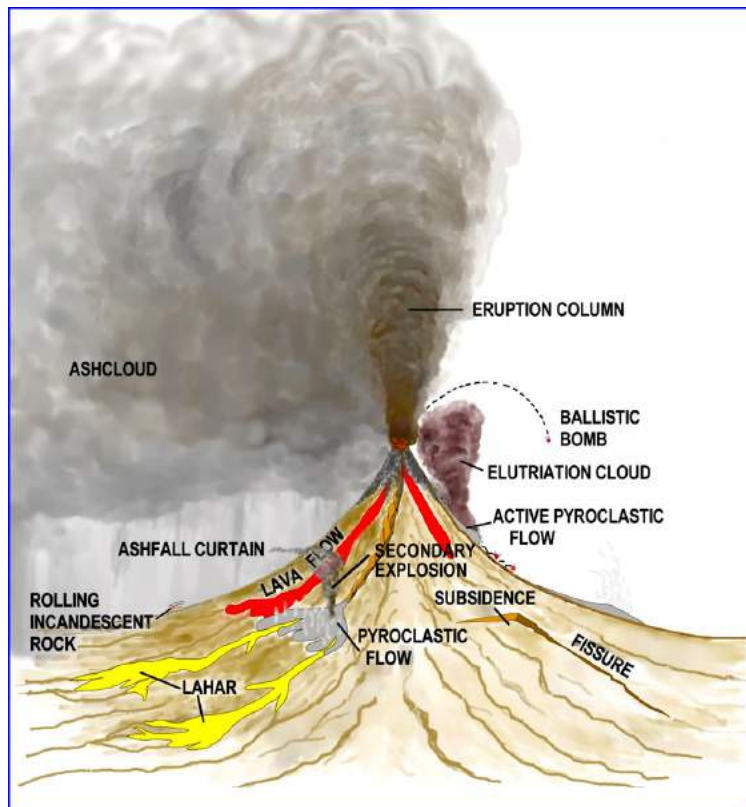


Fig. 2 An illustration of a volcanic eruption and its main components



Fig. 3 Legazpi City, Albay is in low lying area making it susceptible to lahar

Volcanic hazards directly associated with eruption

- Lava flow
- Tephra fall or ashfall and ballistic projectiles
- Pyroclastic density currents or PDCs (pyroclastic flow, pyroclastic surge, base surge)
- Lateral blast
- Volcanic gas

Volcanic hazards indirectly associated with eruption

- Lahar, flooding
- Debris avalanche, landslide
- Volcanic tsunami
- Ground deformation (subsidence, fissuring)
- Secondary explosion
- Secondary PDCs and ashfall

Volcanic Hazards

Lahar (an Indonesian term), sometimes called mudflows or volcanic debris flows, are flowing mixtures of volcanic debris and water.

Lahars are classified into:

- Primary or hot lahar - associated directly with volcanic eruption
- Secondary or cold lahar - caused by heavy rainfall

Lahars distribute and redistribute volcanic ash and debris deposited around the volcano after the materials has cooled and has become water logged.

Lahars can:

- destroy by direct impact
- lead to increased deposition of sediments
- block tributary streams
- bury valleys and communities with debris



Fig. 4 Rain-induced lahar from 1991 Pinatubo eruption displaced people from their homes and covered rich agricultural lands

Pyroclastic density currents or PDCs

PDCs are mixtures of fragmented volcanic particles (pyroclastics), hot gases and ash that rush down the volcanic slopes or rapidly outward from a source vent at high speeds. PDCs range from pyroclastic flows to pyroclastic surges depending mainly on particle concentrations, pyroclastic flows being denser, and therefore ground-hugging currents and pyroclastic surges being more dilute, more mobile currents. PDCs can be generated by the gravitational collapse of the base of eruption columns, or explosion of a lava dome, or by spalling or gravitational collapse of a lava dome or of lava flow margins (called nuée-ardéntes). A special class of PDC called base surges, mobile and water-vapor-rich pyroclastic surges, are generated by explosive phreatomagmatic eruptions. PDCs are the most lethal of all volcanic hazards and can cause incineration, asphyxiation, abrasion, dynamic pressure impact and burial in hot volcanic material.



Fig. 5 Volcanic eruption results to several volcanic hazards including ashfall, pyroclastic flow, and lahar

Pyroclastic flow refers to hot dry masses of fragmented volcanic materials that move along the slope and in contact with ground surface. This includes:

- pumice flow
- ash flow
- block-and-ash flow
- nuee ardente
- glowing avalanche

Pyroclastic surges are turbulent low-concentration density currents of gases, rock debris and in some cases, water, that move above the ground surface at high velocities. They overtop high topographic features and are not confined to valleys. However, this type of flow usually does not travel as far as a pyroclastic flow. (Scott, 1989).

A base surge, a type of pyroclastic surge, is usually formed when the volcano initially starts to erupt from the base of the eruption column as it collapses. It usually does not travel greater than 10 kilometers from its source.

The high temperature of a pyroclastic flow can burn everything along its path. Deposits of pyroclastic flows can bury areas within river valleys and plains.



Fig. 6 Description of pyroclastic flows and its effects to the environment.

1984 Eruption Impacts

- Pyroclastic flows excavated 13 million m³ off the southeastern flank to form the Bonga Gully
- Redirection of the bulk of volcanic hazards towards Legaspi City

Lava Flow

Lava flow is a stream like flow of incandescent, molten rock material erupted from a volcano. Areas buried by lava flows will not be usable for a long time, because lava solidifies into a massive rock. Lava flows composed of low silica magma have low viscosities and tend to flow at high speeds (kilometers per hour), while those composed of high silica magma have high viscosities and tend to move slowly (kilometers per day). Steep slopes encourage faster and longer flows than gentle slopes or terrain.



Fig. 7 Lava flow during Mayon Eruption

Tephra fall or ashfall and ballistic projectiles

Ashfall or Tephra falls are showers of fine- to coarse-grained volcanic materials and other airborne products of a volcanic eruption. Ashfall distribution or dispersal is dependent on prevailing wind direction.

They may consist of pumice, scoria, dense lithic materials or crystals or combination of the four.

Particle size:

- less than 2 mm diameter (ash)
- 2-64 mm diameter (lapilli)
- >64 mm diameter (blocks and bombs)

The fine ash particles, when inhaled, can cause respiratory problems. Thick heavy ash accumulations can cause roofs to collapse. Ashfall is particularly hazardous to aircraft because it can cause jet engine failure.



Fig. 8 (Left) Ash from 2001 eruption of Mayon being drifted to the SE; (Right) students at Legazpi City (SE of Mayon) protecting themselves from ashfall.



Fig. 9 Ash from 31 May 2006 Bulusan Volcano Eruption being drifted to the WNW

Volcanic Gas

Volcanic gases form a dissolved component of magma that is released to the atmosphere in large quantities during eruptions. The principal volcanic gases are water vapor, hydrogen sulfide, sulfur dioxide, carbon dioxide, carbon monoxide, hydrogen chloride and hydrogen fluoride. Minor amounts of nitrogen, methane, argon and helium can also be degassed from magma. Volcanic gases form aerosols that can both cool down the earth's atmosphere and deplete its ozone concentration for a period of time. Some volcanic gases such as hydrogen fluoride are toxic and can endanger livestock that ingest contaminated vegetation. Non-toxic species such as carbon dioxide can also be lethal when released in large quantities, displacing air and causing asphyxiation in human and animal populations.

Active and inactive volcanoes may release to the atmosphere gases in the form of:

- water vapor
- hydrogen sulfide
- sulfur dioxide
- carbon monoxide/dioxide
- hydrogen chloride
- hydrogen fluoride

These are toxic gases emitted by volcanoes that can be harmful to health.



Fig. 10 1993-2000 Eruption Impacts: Topographic inversion: plugging of Mabinit Channel and drainage abandonment

Debris avalanche or volcanic landslide

Debris avalanche or volcanic landslide is a massive collapse of a huge portion of a volcano, usually triggered by an earthquake or volcanic eruption. Debris avalanche or sector collapse is the mass failure of the flanks of a volcano edifice due to magma intrusion, a strong earthquake or the movements of faults beneath the edifice. Debris avalanche events form a horseshoe-shaped scar or amphitheatre, from which the collapse mass has detached from the edifice to form a field of hummocks or small hills downslope of the amphitheatre. Debris avalanches are rare phenomena but are extremely hazardous when they do occur, endangering localities far beyond the usual extents of more frequent volcanic hazards.

Secondary explosions

Secondary explosions are non-eruption explosive events generated when groundwater comes in contact with hot pyroclastic flow deposits at the slope of a volcano and converted to steam. Secondary explosions can be generated in still hot volcanic deposits such as those of PDCs and lava flow when these come into contact with water by erosion, rising groundwater or rainfall. These can cause remobilization of volcanic material to generate small-scale PDCs and minor ash fall.

Volcanic tsunami

Volcanic tsunami occur in caldera lakes when water is displaced by deformation of the lake floor caused by rising magma or the entry of PDCs or landslides into the lake, or in seas when water is displaced by PDCs or debris avalanches from volcanoes. Such tsunamis are unlike those generated by large magnitude offshore earthquakes, which are long-period waves generated by fault displacement or deformation of the seafloor. Tsunami or seiche is made of waves or wave trains that are generated by sudden displacement of water during volcanic eruptions. These could also be generated during undersea eruptions or by debris avalanches.

Lateral blasts

Lateral blasts are laterally-directed thrusts of hot gas and ash that can be generated from an exploding dome on the summit vent or inside the edifice when sudden mass failure of the volcanic flanks occurs. Lateral blasts travel at subsonic speeds at the onset, flattening everything in their paths and causing impacts similar to those of PDCs.

Ground subsidence and fissuring

Ascending magma can cause the volcano edifice to swell before and during an eruption, causing the ground to break up into fissures, typically along weaknesses in the rock such as fractures or faults. After magma has been erupted, its removal from the subsurface can cause the ground to sink and subside and further fissuring to occur.

Ground subsidence and fissuring are typically accompanied by earthquakes, and altogether can cause infrastructural and house or building damages, loss or degradation of land surface and re-routing of waterways and rivers.

Volcano Seismic Monitoring System

Real-time data are streaming to the Mayon Observatory 24-hours daily coming from different monitoring stations remotely installed around Mayon Volcano such as Broadband and Short period seismic systems, infrasonic sensors, electronic tiltmeter and Global positioning systems (GPS). All data in the observatory are transmitted to PHIVOLCS Main Office at Quezon City in real-time via internet or satellite connections. The observatory serves as regional office and delivers products and services of PHIVOLCS to local communities surrounding Mayon Volcano.

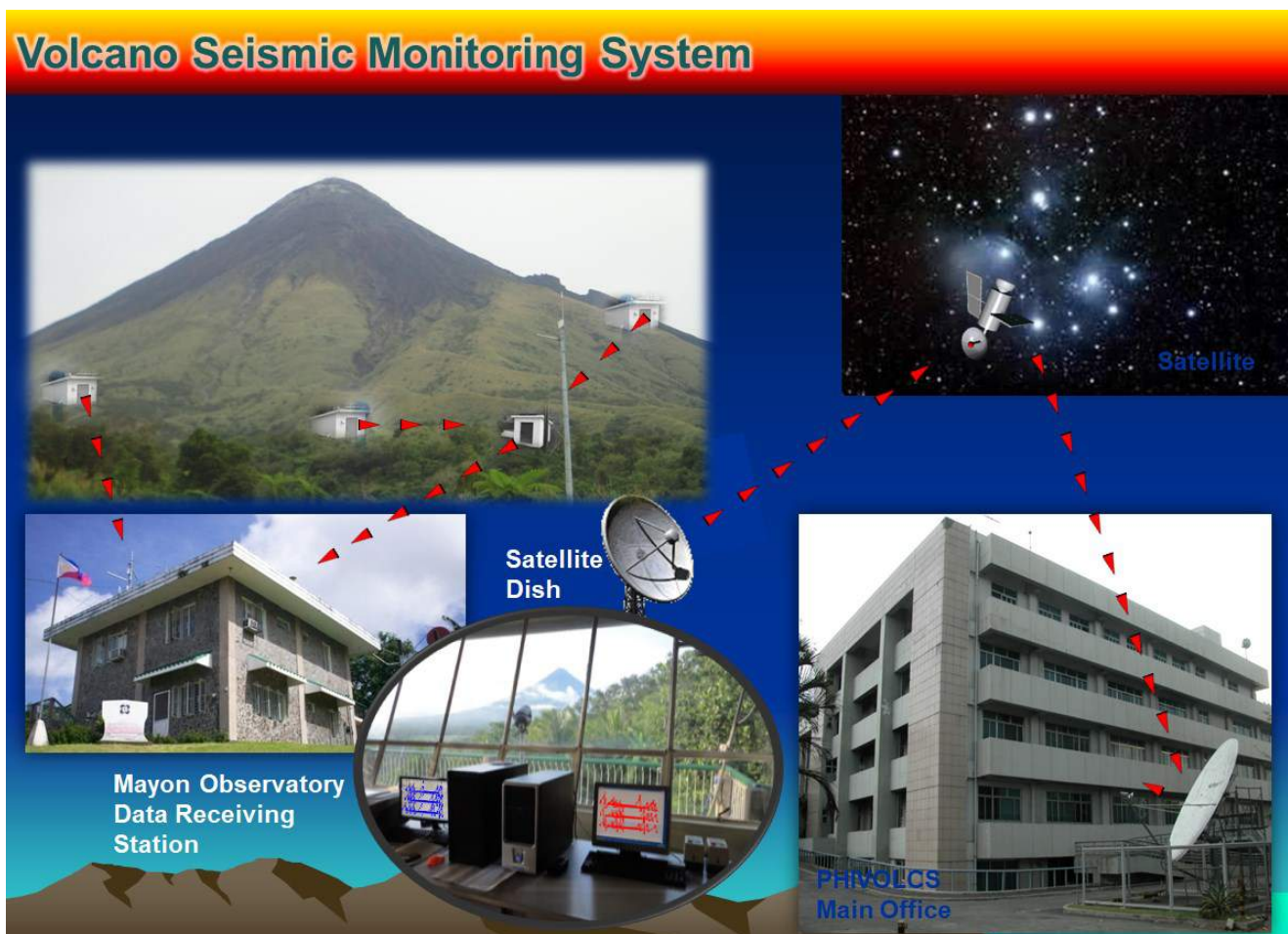


Fig. 11 The Phivolcs volcano seismic monitoring system

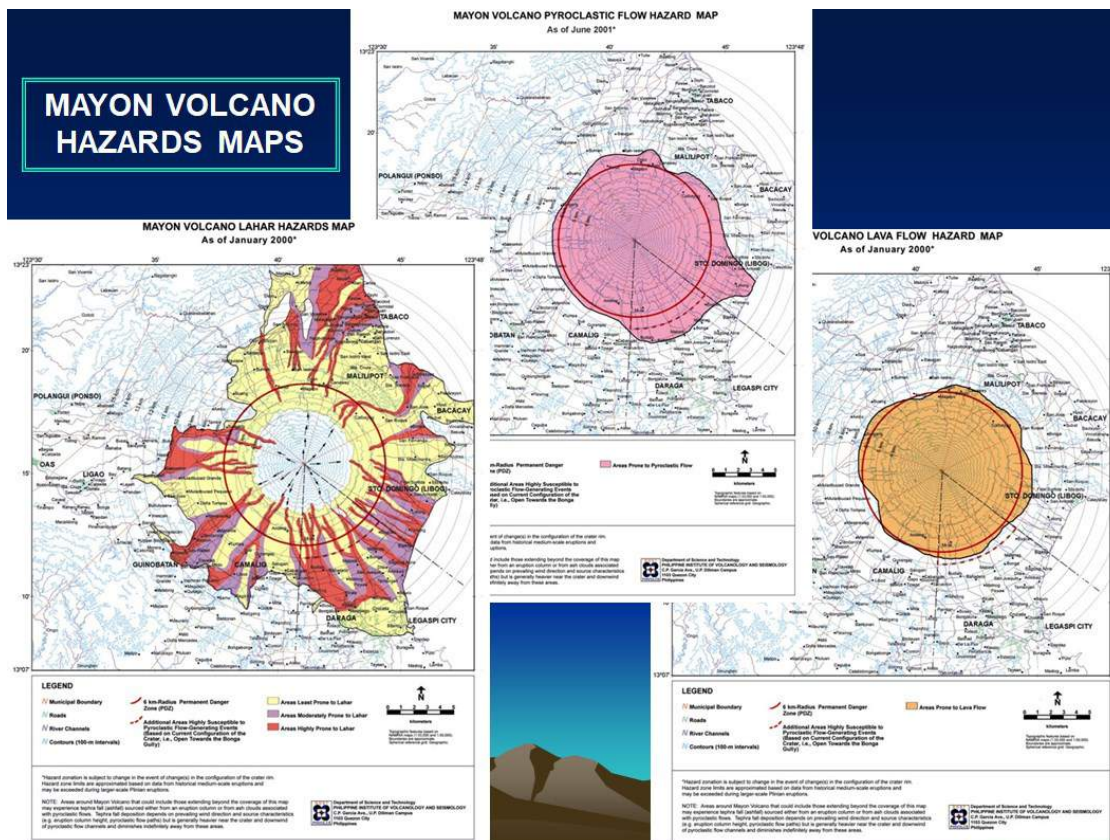


Fig. 12 Sample of various Phivolcs hazard maps

Hazard mapping is one of the main mandates of Phivolcs. Depending on the type of geologic hazard, Phivolcs provide access to data and maps to planners and decision makers in the local government units. Hazard maps are very important reference tools to assess the safety of communities and locate appropriate sites for evacuation. It shows the communities' exposure to hazards, its coverage, and the built up areas that may be affected. Risk maps that show multiple exposure data such as population, hazards such as lahar, and built up (buildings and houses) areas are extremely important in creating preparedness and contingency plans for affected communities.

Synthesis

The Philippines, especially Bicol Region, is prone to natural calamities due to both geological and meteorological hazards. The Mayon Volcano edifice extends up to eight (8) kilometers that put areas within this distance at risk not just to eruption but lahar as well. Legazpi City is in a low-lying area making it susceptible to lahar risks. Mayon Volcano's deposits usually have a volume of a million cubic meters and continuously increases depending how often it erupts. Mayon Volcano activities have no exact recurrence interval or pattern. Phivolcs conducts drone mapping to know the changes and updates of previous deposits and monitors the springs and other bodies of water within the periphery of Mayon Volcano.

Lahar runs in a conical shape. There are no exact locations where will it go through. Even outside in the permanent danger zones or in the periphery areas have no guarantee of safety. Lahar can be hyper concentrated with less 60% water ratio and having turbulent water and debris flow, laminar kind with fast and raging water and allows a two meter rock to float. Straight flow of lahar means higher volume of materials that comes with it. Lahar is an effect of a volcanic eruption. Everything released by Mayon Volcano will be a material of lahar moved or triggered by water.

Areas have different degrees of risks as per hazard. Different methods can be used for preparedness and mitigation measures. Indigenous signs in times of disaster can be possibly true and has scientific reasons, for example, how animals feel and adapt to the changes in their environment. Believing in traditional signs and knowledge can help people prepare for calamities but they must be complemented with scientific knowledge and understanding of hazards caused by natural phenomena.

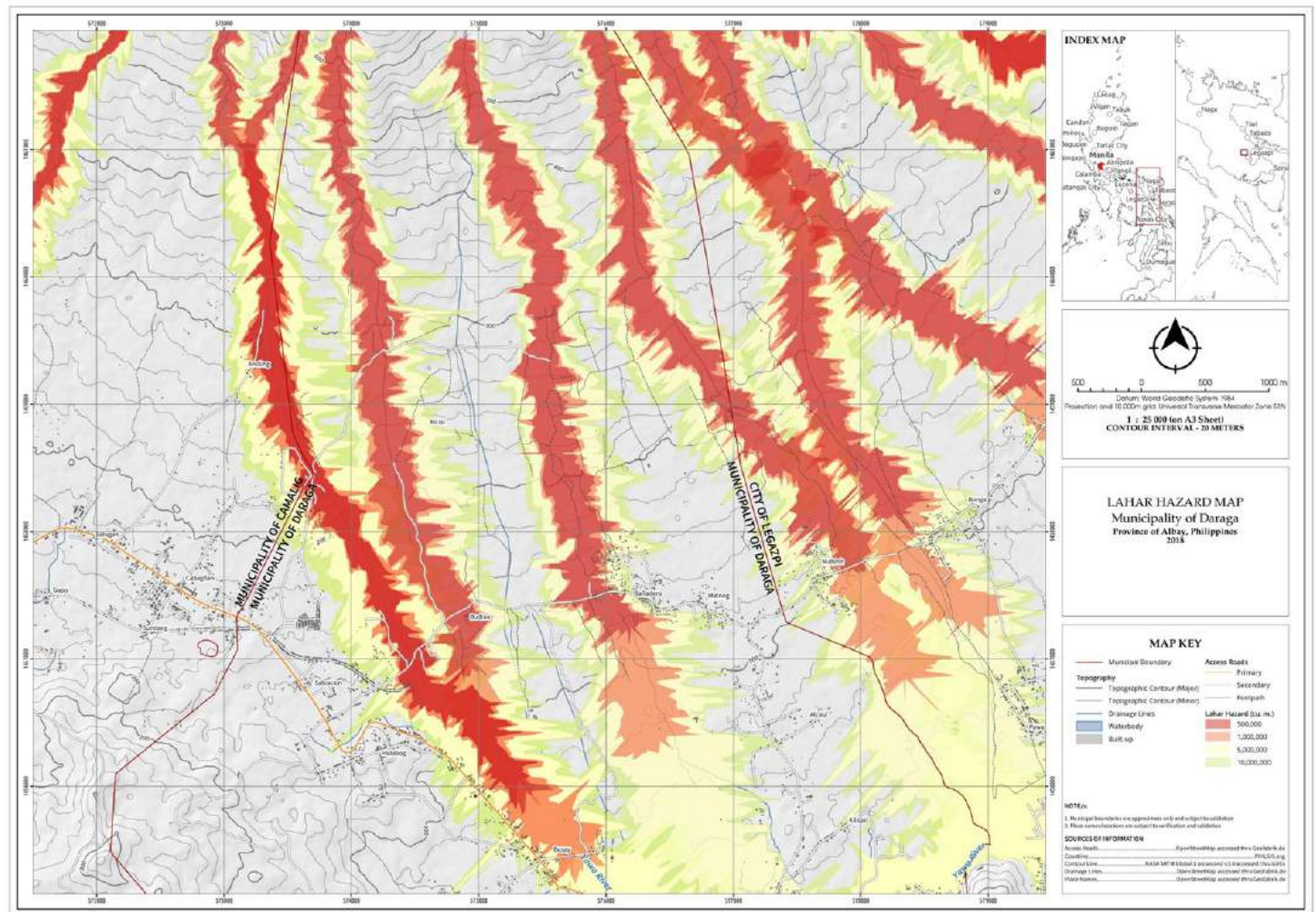


Fig. 13 Lahar Hazard Map of Daraga, Albay

MODULE 2: Warning Systems and Communication Protocols

Description

This session identifies the warning systems appropriate for lahar preparedness. It involves integrating scientific knowledge and community knowledge in predicting, forecasting, detecting, decision-making, communicating risks and advisories to mobilize communities for early evacuation.

This session also aims to provide information on how means of communication and information can be made accessible in different formats, channels and protocols. Emphasis on inclusion Disability, Gender and Age (DGA) through role-play, interactive discussion and workshops.

Key Message

We want to acknowledge both local knowledge and scientific knowledge are important in developing a community based early warning system. We want to be able to build an early warning system that is inclusive and accessible for the entire community. Developing context-specific warning criteria with the communities can assist in facilitating better communication protocols and evacuation plans. Inclusive communications need to reach all people including persons with disabilities because they are often neglected or forgotten in communication. Inclusive communications use a variety of methods that recognize community participation and capacity.

Objectives

1. To develop lahar warning criteria
2. To create local and community-based EWS
3. To define communications and protocols
4. To discuss rights, roles and responsibilities in accessing information and communication.
5. To identify existing and alternative communication protocols
6. To discuss practical ways to make inclusive communication
7. To develop an official communication protocols for lahar preparedness

Learning Outcomes

At the end of the session:

1. Through the support of APSEMO, Phivolcs, and PAGASA, the participants will be able to create a near-real time warning system for lahar preparedness.
2. Participants are able to describe what alternative methods they use and how barangay communication strategy properly reach all people including persons with disabilities
3. Participants are able to identify existing community communication protocols
4. Participants are able to define their own communication protocol checklist to feed in the overall lahar anticipation planning

References

PAGASA Learning Tools: Retrieved from <http://bagong.pagasa.dost.gov.ph/learnings/learning-tools>

HI Policy on DGA, UNCRC, International convention on the rights of the child, Art. 1: Segmentations by age group vary according to the sector (Health, education...) and their institutions (WHO, UNICEF, etc.), Humanitarian Inclusion Standards for Older People and Persons with Disabilities“Minimum Standards for Age and Disability Inclusion in Humanitarian action”

Session 1: Weather Systems

Introduction

This session illustrates the five forms of weather hazards that can trigger lahar. This module focuses only on anticipation actions for lahar risks and participants from local government units and disaster practitioners should be able to identify the weather conditions that may induce lahar flow in their areas through prolonged rainfall. Identifying their characteristics, frequency of occurrence, timing, and terminologies are helpful in creating a localized warning system. It also introduces the participants the basics of weather forecasting and rainfall measurement as main components in creating a warning system.

Key Concepts

What is a weather forecast?

A weather forecast is simply a scientific estimate of future weather condition. Weather condition is the state of the atmosphere at a given time expressed in terms of the most significant weather variables. The significant weather variables being forecast differ from place to place. In the Philippines, the weather parameters with significant variation and therefore of interest to the users of the forecast are cloudiness, rainfall and wind.

How is a Weather Forecast Made?

First Step: Observation

Second Step: Collection and Transmission of Weather Data

Third Step: Plotting of Weather Data

Fourth Step: Analysis of Weather Maps, Satellite and Radar Imageries and Other Data

Fifth Step: Formulation of the Forecast

In forecasting the weather, a meteorologist must at least know something about the existing weather condition over a large area before he can make a reliable forecast. The accuracy of his forecast depends largely upon his knowledge of the prevailing weather conditions over a very wide area. The forecast decision is based on various forecasting tools. The basic tool of a weather forecaster is the weather map. (PAGASA)

Weather Systems that May Trigger Lahar:

WEATHER SYSTEM	CHARACTERISTICS
Thunderstorm Weather disturbance that produces thunder and lightning, aside from wind and rain. Thunderstorms occur locally, often as episodes of cyclones, and in common with squalls, are marked by abrupt variations in pressure, temperature, and wind.	<ul style="list-style-type: none"> Brings heavy rains, lightning and sound and can last in a maximum of 2-3 hours. Can cause flooding, landslide, lahar, hail storm, tornado, and electrocution. Thunderstorm affects high infrastructures and anything in open spaces. The distance of thunderstorms from where a person stands can be determined by counting 1001 to 1005 in a normal speaking voice after the last lightning.
Monsoon A wind that reverses its direction with the season, blowing more or less steadily from the interior of a continent toward the sea in winter, and in the opposite direction during summer.	Northeast Monsoon (Amihan) <ul style="list-style-type: none"> Cold and dry winds and affects eastern part of the country. Brings light to moderate rains. Brings rainfall and typhoon events to Bicol from November to February.
	Southwest Monsoon (Habagat) <ul style="list-style-type: none"> Warm and moist air. Triggers thunderstorm and lightning. Strengthened by tropical cyclone. Usually happens from May to September
Intertropical Convergence Zone (ITCZ) The axis, or portion of the broad trade winds current of the tropics. This axis is the dividing line between the southeast trades and the northeast trades.	<ul style="list-style-type: none"> Series of low pressure areas brought by convergence, northeast and south-easterly wind above the equator. Causes thunderstorm and rain shower Become a tropical cyclone when developed.
Cold Front The forward edge of an advancing cold air mass which is displacing warmer air in its path.	<ul style="list-style-type: none"> Cold winds Happens in November to February Typhoon can happen simultaneously with other weather disturbances such as cold front and monsoon.
Tropical Cyclone The general term for a cyclone that originates over the tropical oceans. Low Pressure Area Areas of lowest pressure characterized by cloudiness and rain showers, areas where a tropical cyclone can form	<ul style="list-style-type: none"> Intense low pressure area. It has 3 parts namely eye, eye wall, and rain band Happens usually in the last quarter of the year. 5 effects of tropical cyclones are storm surge, flood, landslide, flash flood, debris flows The eye wall of a Tropical Cyclone holds the strongest rainfall. Signal number 1-5 is based on the measurement of wind not the rainfall volume. There's a minimum of 3 Tropical Cyclones that directly hit the Philippines every year.

Table 2 Weather systems that may trigger lahar and their characteristics.

Measuring Precipitation (Rainfall)

The Climate of the Philippines is tropical and maritime. It is characterized by relatively high temperature, high humidity and abundant rainfall. It is similar in many respects to the climate of the countries of Central America. Temperature, humidity, and rainfall, which are discussed hereunder, are the most important elements of the country's weather and climate.

Rainfall is the most important climatic element in the Philippines. Rainfall distribution throughout the country varies from one region to another, depending upon the direction of the moisture-bearing winds and the location of the mountain systems.

Here are some types of rain gauges to measure rainfall:



Eight (8)-inch Rain Gauge

An 8-inch rain gauge, so called because the inside diameter of the collector is exactly 8 inches above a funnel that conducts rain into a cylindrical measuring tube or receiver. The volume of the collector is 10 times the volume of the measuring tube. Therefore the actual depth of rainfall is increased ten times on being collected in the smaller measuring tube.

To measure the amount of rainfall accumulated in the measuring tube, (a) a thin measuring stick with the magnified scale printed on its face is used. The precisely dimensioned (b) measuring tube has a capacity representative of only 2 inches (50.8 millimetres) on flat level ground. Rainfall exceeding this amount spills into the (d) overflow can but can be easily measured by pouring it into the measuring tube for total rainfall. (PAGASA) (Fig. 14 An eight-inch rain gauge)

Tipping Bucket Rain Gauge



The tipping-bucket rain gauge is a type of rainfall recording instrument. It is an upright cylinder that has funnel-shaped collector. The precipitation collected by the collector empties into one side of a "tipping bucket", an inverted triangular contraption partitioned transversely at its center, and is pivoted about a horizontal axis. Once one compartment is filled with rain, it tips, spilling out the water and placing the other half of the bucket under the funnel. The tipping activates a mercury switch causing an electrical current to move the pen in the recorder. Each tipping is equal to one-half millimeter of rainfall. (PAGASA) (Fig. 15 A tipping bucket rain gauge)

Automated Rain Gauge



The automated rain gauge (ARG) gauging station is developed to gather and record the amount of rainfall over a set of period of time and automatically sends the data to a central based station on a predetermined interval basis. The rainfall data are sent wirelessly through the cellular network as a text message or Short Messaging System (SMS). Designed to be rugged and standalone, the station can be deployed even in the harshest remote areas and can operate continuously, as it gets power from the sun, backed up by the internal rechargeable battery. The deployment of this ARG is part of the Development of Hybrid Weather Monitoring System and Production of Weather and Rain Automated Stations Project, which aims to develop and deploy a network of automated weather stations and ARGs to monitor real-time weather changes occurring in specific localities all over the country. (DOST-ASTI)

(Fig. 16 An automated rain gauge station developed by DOST-ASTI)

Synthesis

PAGASA is the foremost warning agency in the country on hydrometeorological hazards. Official weather and climate based hazards warnings come from this agency and disseminated through local government units in different platforms.

There is a difference between climate and weather. Climate is a measurement of weather variables while weather is what we see and feel outside.

Weather calendar of hydrometeorological phenomena that may cause intense rainfall and trigger lahar:

- Thunderstorm occurs frequently from June to October
- Amihan occurs from October to March
- Habagat occurs from June to September
- ITCZ frequently occurs from August to October
- Cold front usually occurs from November to March
- Tropical Cyclone is stronger during the last quarter of the year

Measuring rainfall is integral in creating a lahar warning system. Data from a manual and local or community rain gauge should be supplemented by the official rainfall warning from PAGASA for a more informed warning data.

Installing a rain gauge should be coordinated with PAGASA for proper calibration and instruction on how to read and interpret.

Session 2: Real-time Warning Systems

Introduction

APSEMO will discuss existing strategy for EWS on lahar and its relationship and significance of communication protocol and evacuation procedure to achieve zero casualties:

- Hazard Warning Flow – Natural Hazards
- Early Warning System (Province of Albay)
- Three levels of warning: Alert, Prepare, Evacuate

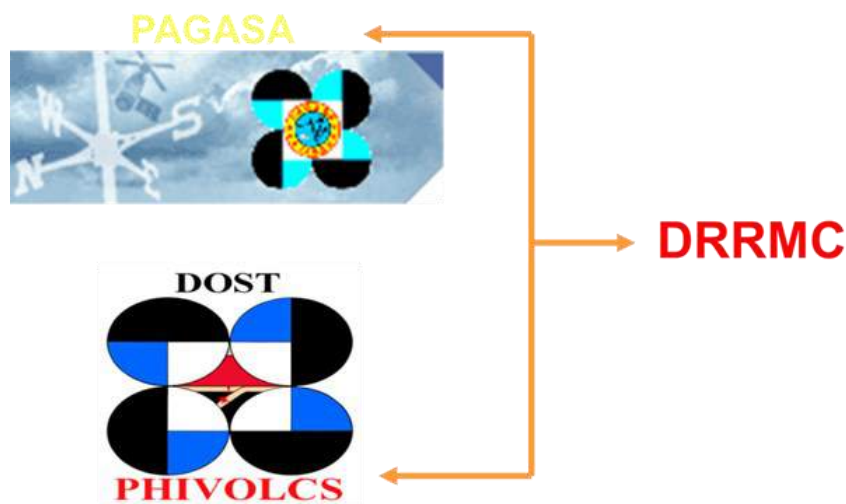
APSEMO will also discuss the roles and responsibilities of observers and other functions of the BDRRMC in the EWS. Warning criteria development and corresponding action by barangays and municipal DRRMOs will be formulated thru workshop and lecture discussion. The participants are expected to formulate their own warning system based on their needs and experiences with the integration of the knowledge on lahar.

Key Concepts

Warning System

1. It is designed to give forewarning of the likelihood of calamity occurrence in order to save lives and property.
2. It ensures that the end users receive appropriate and early warning information through the existing communication system to take effective actions in saving lives and properties.

Working Relationships between PDRRMC and Warning Agencies



9

Fig. 17 The relationship between the PDRRMC and the two warning agencies in hydromet and geologic hazards

Warning flow starts from the release of weather advisory from PAGASA/PHIVOLCS to PDRRMC and media and passed through LGU down to barangay committees (early warning, communication protocol, evacuation procedure).

Basic Elements of a Community-Based Early Warning System



Fig. 18 Basic Elements of a Community-Based Early Warning System

Community-based early warning starts with a **prediction** or the subjective and experiential process of estimating the impacts of potential hazards. For example, expecting typhoons between June to December is normal because the second half of the year is considered the rainy and typhoon season. When data (typhoon track, amount of rainfall, temperature, etc.) is being presented, a **forecast** can be made. A forecast is the future state of the atmosphere with specific reference to one or more associated weather elements. **Detection** is the process of identifying or assessing whether a community is in the path of a hazard and how much is the potential impact to the population, area, livelihood, and critical facilities among others. It is the basis for creating **decisions** on what to do next to avoid or prevent potential impacts. A decision needs to be **communicated** to affected stakeholders at an appropriate time and through proper communication medium. Based on the information presented and communicated, task units or committees need to be **mobilized** to take action according to their roles and responsibilities. Early action or anticipating risks through early warning is important in ensuring zero casualties.

Early warning, communication and evacuation committees should work together as a team because failure of one committee will result to ineffective warning system.

Roles of committees:

- Early warning is in-charge of prediction, forecast, and detection
- A communication protocol is for decision and communication
- Evacuation procedure will be responsible for mobilization

Components of the community early warning system include observers, communication network, decision component, and response.

Communication medium should be inclusive and available within the community. It can be a bell, text message, and/or a two-way radio. The corresponding system of each medium should be agreed by BDRRMC and relayed to the community.

PDRRMC/APSEMO aims the empowerment of every barangay in terms of DRRM implementation. Barangays can decide when to evacuate without waiting for the order from PDRRMC, because they know their community. But in actions like this, they must inform their MDRRMO.

Mudflow Warning Plan

The Mudflow Warning Plan is the basis for creating early actions in anticipating risks presented by lahar. The mudflow warning is based on categorized rainfall data and interpretations corresponding to three levels with required appropriate types of actions.

The three levels are categorized according to a specific threshold value or the amount of rainfall that will cause lahar to move. A 35-40mm accumulated rainfall per hour calls the need for evacuation. If it reaches 60mm accumulated rain in one hour, it is already destructive. By this time, the affected communities should have already evacuated.

Three types of warning:

- Yellow - Alert
- Orange - Prepare
- Red - Evacuate

Mudflow Warning Plan			
Warning Level	Criteria	Interpretation	Required Actions
0	No Rain	Normal	Normal Community Activities
1	Rain at 10-15 mm per hour	Alert Stage	Monitoring of river condition and rainfall
2	Rain at 25-30 mm per hour	Preparedness Stage	BDCC and Community are preparing for evacuation
3	Rain at 35-40 mm per hour	Evacuation Stage	Evacuation Movement

Fig. 19 APSEMO's Mudflow Warning Plan

Early warning plans must contain the appropriate actions needed in a certain warning level in every barangay. This empowers barangay officials to be more responsible in times of disaster.

Activity

1. Group the participants (ex. barangay, LGUs, NGAs, and CSOs) according to affiliation
2. Provide them met cards in yellow, orange and red (according to the three warning levels)
3. Write the required actions in the barangay, LGUs, NGAs, and CSOs according to the three warning levels
4. Place the results side by side per group according to warning levels
5. Synthesize results by going through each met card; make sure the answers are clear and validate to the audience, they should be specific

Sample output:

BARANGAY	LGU	DILG
<ul style="list-style-type: none"> Conduct emergency meeting of BDRRMC with their task unit. Monitoring of river channels and installation of flag markers to puroks. (according to rain volume) Review contingency plan Issuance of public advisory Preparation of survival kits. Coordinate with MDRRMC 	<ul style="list-style-type: none"> Activate MDRRMC Monitoring of weather forecast through APSEMO/NGAs. Activation of BDRRMC through advisories from MDRRMC. Review of emergency action plan by area. Issuance of advisories and close monitoring of river channels. Meeting of Punong Barangays. Coordinate with PDRRMO 	<ul style="list-style-type: none"> Serve as link of the LGUs and higher office in cascading information through reporting and feedbacking. Ensure that LGUs has performed the preparedness measures for DILG CODIX Protocol Information to LCE and local DRRO of the advisory.
<ul style="list-style-type: none"> Coordination with MDRRMO for preparation, medicines and transportation needs. Coordination regarding evacuation centers. Installation of orange flag Vehicle count/dispatcher at designated pick-up points. Coordinate with MDRRMC for possible evacuation and task units will inform this as well to the residents. Advise households to prepare survival kits and secure their houses. 	<ul style="list-style-type: none"> Stock piling Preparation of designated evacuation centers and setting-up of pick-up points in case of immediate evacuation. Activation of camp managers/chief. Prepositioning of logistics and resources. Coordination with PDRRMO, BFP, PNP, AFP, RHU, and MSWDO. Suspension of classes advisory. Emergency meetings Issuance of advisory Preparation of evacuation kits for vulnerable population. 	
<ul style="list-style-type: none"> Prioritize vulnerable sectors Prepare transportation and security measures for all evacuees. Issue final warning signal for evacuation. 	<ul style="list-style-type: none"> Mobilization within 3 hours Assignment of rescue vehicles. (with drivers and pool products) Evacuation of vulnerable sectors and monitoring of evacuees at designated evacuation centers. Issuance of evacuation advisory especially for population at risk. 	<ul style="list-style-type: none"> Gather/monitor report from MDRRMO regarding number of evacuees, casualties, and damaged facilities

Table 3 A sample matrix of the action plans of the LGUs and a government agency according to the three alert warning levels

Synthesis

Mudflow Warning Plan should be specific from the activities, communication protocols, and responsibilities of persons-in-charge appropriate for each warning level.

Inform the PDRRMO, MDRRMC, BDRRMC, BHWs, Tanods and other involved units on whatever actions or precautionary measures the LGU/barangay will make. Early anticipation of risks results to zero casualties, assuming that these officials have already been oriented on their roles and responsibilities.

The LGU will be responsible for the release of warning advisory if the rain gauge is placed at the municipal level. Data from barangay or community-based rain gauges should be communicated to the LDRRMO to supplement their data which can be basis for appropriate actions.

In times of emergencies and disasters, always consider mobilizing every resource available in the barangay level and not depend too much on DRRM funds. Community-based preparedness or evacuation drills should be conducted from time to time.

Session 3: Communication Protocols (Rights, Roles and Responsibilities to Access Information & Warning Advisories)

Introduction

Communication protocols must be established for an effective warning system. Through this, the stakeholders know their roles and responsibilities to be able to deliver pertinent information in a timely, inclusive and appropriate manner. Developing advisories and communicating information from the provincial, municipal or city level, to the barangay level differ must be complementary to the type of information, official authority, and receiver whether it's the LGUs or the affected communities.

Key Concepts

Communication System

Communication System is a process whereby information is enclosed in a package and is channeled and imparted by a sender to a receiver via some medium. The receiver then decodes the message and gives the sender a feedback. All forms of communication require a sender, a message, and an intended recipient; however the receiver need not be present or aware of the sender's intent to communicate at the time of communication in order for the act of communication to occur.

Types of Communication Based on Communication Channels

Verbal Communication

- Oral communication refers to the spoken words in the communication process. Oral communication can either be face-to-face communication or a conversation over the phone or on the voice chat over the Internet.
- Written communication can be either via snail mail, or email. The effectiveness of written communication depends on the style of writing, vocabulary used, grammar, clarity and precision of language.

Non-verbal Communication

- Non-verbal communication includes the overall body language of the person who is speaking, which will include the body posture, the hand gestures, and overall body movements.
- Non-verbal communication can also be in the form of maps, pictorial representations, signboards, or even photographs, sketches, and paintings.

Types of Communication Based on Styles and Purposes

1. Formal Communication

- Includes all the instances where communication has to occur in a set formal format
- Can also occur between two strangers when they meet for the first time. Hence formal communication is straightforward, official and always precise and has a stringent and rigid tone to it
- The style of communication in this form is very formal and official. Official conferences, meetings and written memo.

2. Informal Communication

- Includes instances of free unrestrained communication between people who share a casual rapport with each other
- Requires two people to have a similar wavelength and hence occurs between friends and family
- Does not have any rigid rules and guidelines
- Need not necessarily have boundaries of time, place or even subjects for that matter

Support DISASTER Communication System

1. Voice Communication

- Telephone (landline and mobile)
- VHF/UHF Radio Set
- Skype

2. Data Communication

- SMS (Infoboard)
- Text Messages
- E-mail
- Facebook

3. Others:

- Sound signal
- Sign signal

PDRRMC/APSEMO's Role in Communication Networking

The Provincial Disaster Risk Reduction and Management Council or APSEMO in Albay plays a big role in coordinating with various stakeholders in keeping the province safe and ensuring zero casualties. It coordinates with the national government; international and national NGOs in conducting risk assessments, planning, and if there is an impending typhoon, volcanic eruption, and other potential hazards which may result to disaster on large scale. At the provincial level, it works and communicates with the members of PDRRMC to coordinate tasks and enable action plans during an alert or emergency. It also provides official advisories to the municipalities and communities in collaboration with and according to data presented by warning agencies like PAGASA and Phivolcs in case of an alert.

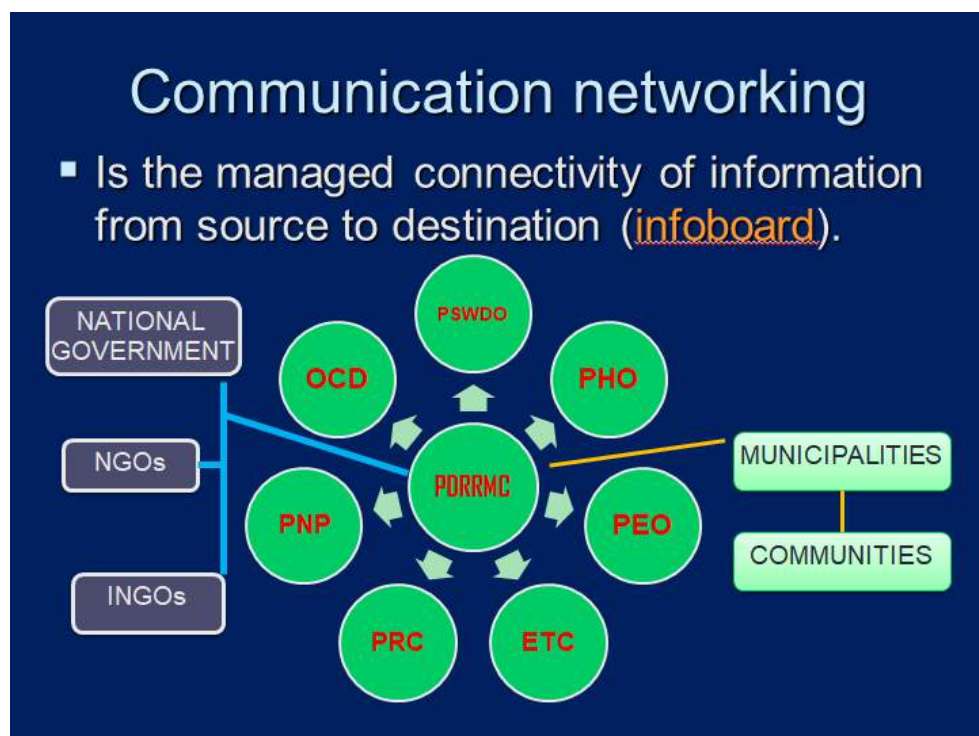


Fig. 20 APSEMO/PDRRMC communication network

PDRRMC/APSEMO Communication & Information Protocol

Below is an illustration of the communication and information protocol followed by PDRRMC, MDRRMC, BDRRMC in communicating warnings and other pertinent information during an impending hazard that may affect the area. Warning agencies like PAGASA and Phivolcs are the main source of scientific data and warning bulletins. APSEMO then interprets the data and creates the content of the information that it is going to relay to MDRRMCs of affected areas. It also assesses the risk and include in the advisory actions to be taken. The MDRRMC communicates the information to the barangay which, in turn, informs the affected communities. All of this must be done in a timely manner corresponding to different alert levels.

Official reports and advisories are channelled through and communicated by the PDRRMC and MDRRMC to the BDRRMC. Both MDRRMC and BDRRMC provide reports or updates on the current situation of their areas or communities to the PDRRMC. If the damages are massive and require the declaration of the state of calamity for the province, the PDRRMC reports to the higher DRRMC such as OCD-NDRRMC to be able to access additional resources and support for the province.

Various media platforms, both online and traditional, including community-based warning systems play a big part in communicating warning and risk information. It must be inclusive to be able to reach everyone in the community and to ensure no one is left behind.

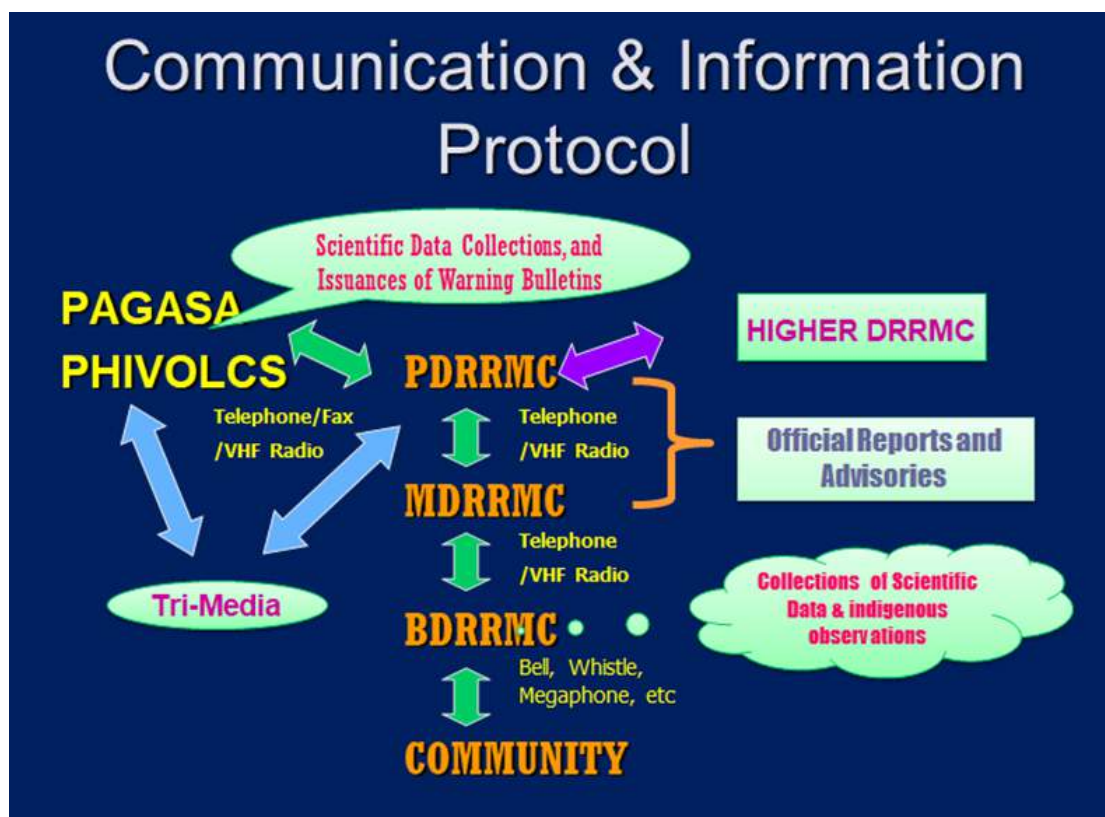


Fig. 21 APSEMO/PDRRMC communication and information protocol

Phivolcs Lahar Advisory



Republic of the Philippines
Department of Science and Technology
PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY



MAYON VOLCANO ADVISORY

27 January 2018

10:30 AM

Heavy rains over the Province of Albay brought about by the tail-end of a cold front have increased the dangers of syn-eruption lahars on major channels draining the Mayon Volcano edifice that have been deposited with thick pyroclastic density current or PDC material and ashfall. The total volume of PDC deposits so far deposited on the watershed areas, mostly on the Buyuan and Miisi channel watershed, is approximately 9 million cubic meters, excluding unverified deposits on the northern flank. The total volume of ashfall on the western sector is roughly 1.5 million cubic meters. These deposits can be remobilized by rainwater and generate lahars by themselves and or by incorporating existing erodible material on channel banks.

PHIVOLCS therefore warns of potential lahars and sediment-laden stream flows on all river channels draining the slopes of Mayon Volcano especially the Buyuan, Miisi, Mabinit, Basud, San Vicente, Buang, Quirangay and Masarawag-Maninila that may be generated by heavy rainfalls brought about by the cold-front. Communities and local government units beside these river systems are advised to be additionally vigilant and to move residents to high ground when heavy rains occur. Alert Level 4 remains in effect over Mayon Volcano and DOST-PHIVOLCS maintains its close monitoring of Mayon Volcano and any new development will be communicated to all concerned stakeholders.

DOST-PHIVOLCS

Fig. 22 A sample of an actual Phivolcs advisory on Mayon Volcano warning of potential lahar and sediment-laden stream flows

Synthesis/Guiding Principles

- Leadership and Courage
- Simplify don't complicate
- Institution oriented not personality
- Make communication system a permanent not temporary component
- Solution oriented not problem oriented
- Think communication as development investment

Redundant utilization of communication systems guarantees sound Disaster Risk Reduction as it contributes in achieving “zero casualty” objective.

Session 4: How to handle/assist disability, gender, and age

Introduction

Important Reminder/Note to the facilitator:

The facilitator will ask the participants to express their views about the Disability, Gender and Age or do they know about any local beliefs about disability (explain disability cut across women, men, children and older people and LGBTQ). Their ideas will be listed down by the facilitator and or co-facilitator will list down all their answer in the meta cards.

Include a minute or two for questions and clarifications before moving to the next session. If possible, provide a one slide summary of “Points to remember” based on key messages

Key Concepts

Suggested definition of DGA:

Disability: According to the Preamble of the Convention on the Rights of Persons with disabilities (CRPD), “Disability is an evolving concept. Disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others.

Gender: refers to the social and political roles, behaviours and attributes which are constructed for men and women by a given society and which each given society considers most appropriate and “valued” for women and men.

Age: Stage in a life cycle seen as a continuum of biological, behavioral and psychosocial processes. Age is also a social construction, as the perception of age and the representations associated with it vary considerably between cultures, within cultures and over time.

Children: According to the International Convention on the Rights of the Child, “child” refers to “every human being below the age of eighteen years unless under the law applicable to the child, majority is attained earlier”.

Young people: As per UN definition, young people design the 10-24 age category, adolescents include 10-19 year olds; and youth include 15-24 year olds. However, depending on the culture, being considered a youth include ages well above 24 years old.

Older people: Older people represent a rapidly growing proportion of the population in many countries. Depending on the culture, being considered old is not necessarily a question of age. It is more to do with circumstances such as becoming a grandfather or a grandmother, or physical signs such as the appearance of white hairs. Many sources consider someone to be old from the age of 60 years.

Activity

- Present the word DISABILITY, GENDER and AGE and ask the participants to share through small groups their understanding of the word;
- Participants will write their outputs, 1 item per metacard and or post it on a cartolina/ manila paper (with the support from co-facilitator);
- Each group can present a summary through a chosen representative;
- Facilitator will process all collected information and make use of this later in classifying outputs;
- Facilitator will show participants pictures of (1) Person with physical disability (2) Person who has visual disability (3) Person who has hearing disability and sequentially ask the participants how will they interact with them (3-5 answers for each disability);
- Facilitator will then ask (2) volunteers for each to demonstrate how will they interact with the person with disability, and ask them to explain their actions;
- Facilitator will point out good practices and those that need improvement from the volunteers' actions;
- Facilitator will discuss how to interact with each of the disabilities presented;
- Facilitator will also discuss relevant assistive devices and accessibility measures per disability link to lahar preparedness.

Synthesis/key talking points

Some older people and persons with disabilities do not need to be transferred to healthcare facilities unless they have serious injuries or face life threatening situations. always allow persons with disabilities, older people and women to give advice on their specific needs regarding rescue and evacuation techniques to move and carry them, the need for assistive devices, etc. keep in mind during the preparedness phase should be participatory, including persons with disabilities, older people and women and their representative organizations DPOs to give the best advice about their specific needs. Also include them in emergency simulation and in mock drills and if possible invite them to be part of committees.

It is advisable try to include someone who knows the person with disability, older persons and persons who have severe medical condition (caregiver/family member) or someone familiar on working with Gender, age and disability including community health professionals, community leaders, sign language interpreter, teachers or DPOs during evacuation and or in the preparedness

There are certain transportation techniques can be very risky (example pick-a-back to be avoided if any doubt of spinal cord injury) to help you support stretchers, chairs or trolleys can be very helpful to move people in an uneven environment. Appropriate equipment such as stretchers, wheelchairs, or crutches is not only helpful for persons who had impairment before the disaster, but also for newly injured people, older people and pregnant women, who may face mobility problems. (Source mainstreaming disabilities in DRR training manual, HI)

MODULE 3: Evacuation Protocols

Description

This session will allow participants to enhance their community evacuation plan for lahar hazard by ensuring that specific needs of vulnerable people and persons with disabilities are addressed. This requires appropriate preparation and planning prior to lahar. Vulnerable people, including persons with disabilities and their families must be included in the preparedness phase so that their specific needs are understood and appropriate responses can be implemented.

Key Message

- Inclusive evacuation planning needs to be safe, accessible and (child-friendly).
- Effective evacuation planning contributes to a more resilient community.
- Proactive and participatory planning is responsive to the specific and diverse needs of the community.

Objectives

1. To identify proper evacuation planning procedures and types of evacuation movement
2. To list and map available resources and facilities to be used for evacuation.
3. To assess the safety and accessibility of the designated evacuation routes and area.
4. To describe the characteristics of a safe and accessible evacuation area.

Learning Outcomes

At the end of the session:

- Participants are able to create inclusive evacuation plan that cater to the specific needs of vulnerable people, persons with disabilities and their families.

References

- Lahat Handa
- Accessible Evacuation Plan
- Child Protection in Emergencies
- Lead Time for Vulnerable Sectors
- Sphere Minimum Standards for Shelter and Settlement

Session 1: APSEMO Evacuation Protocols

Introduction

Planning and coordination are two essential components of evacuation. Evacuation must be done in a systematic manner to ensure that at-risk and vulnerable population are protected and their differentiated needs are addressed. To be able to do this, the MDRRMC and BDRRMC must be able to mobilize their task units and implement their contingency plans properly. Their specific roles and responsibilities must already been internalized to perform their functions well. Identifying safe sites and routes are other important components of evacuation. This is where planning and risk assessment become very valuable; and it takes a well-established, knowledgeable and functioning DRR council to create and implement an evacuation plan.

Key Concepts

Evacuation

Sequential movement of population at risk to safe emergency shelters prior to the impact of disaster

- Should be systematic
- Should be executed the shortest possible time
- Should follow the shortest route
- Should give preference to the most vulnerable individuals

Evacuation Planning Procedures

1. Identify at-risk population

Risk mapping includes identifying at-risk population or the people in the communities that are exposed to hazards. The MDRRMC and BDRRMC must prepare the population database including disaggregated data of women, children, and persons with disabilities, senior citizens and those that require specific assistance or support.

2. Establish selection criteria of safe evacuation centers

Risk and vulnerability assessment: it is critical that a comprehensive risk and vulnerability assessment is undertaken, including actual or potential security threats and the particular social or economic vulnerabilities of differing social groupings within the affected and any host community.

Risks posed by the localised impact of natural hazards such as earthquakes, volcanic activity, landslides, flooding or high winds in any given location should also be assessed. Locations close to buildings or structures vulnerable to earthquake aftershocks, land formations vulnerable to landslides, low-lying sites prone to further lava flows or the

build-up of exhaust gases, riverbanks and depressions at risk from further flooding and sites exposed to high winds should be avoided, until the as assessed risks of returning to such locations have satisfactorily diminished. (Sphere)

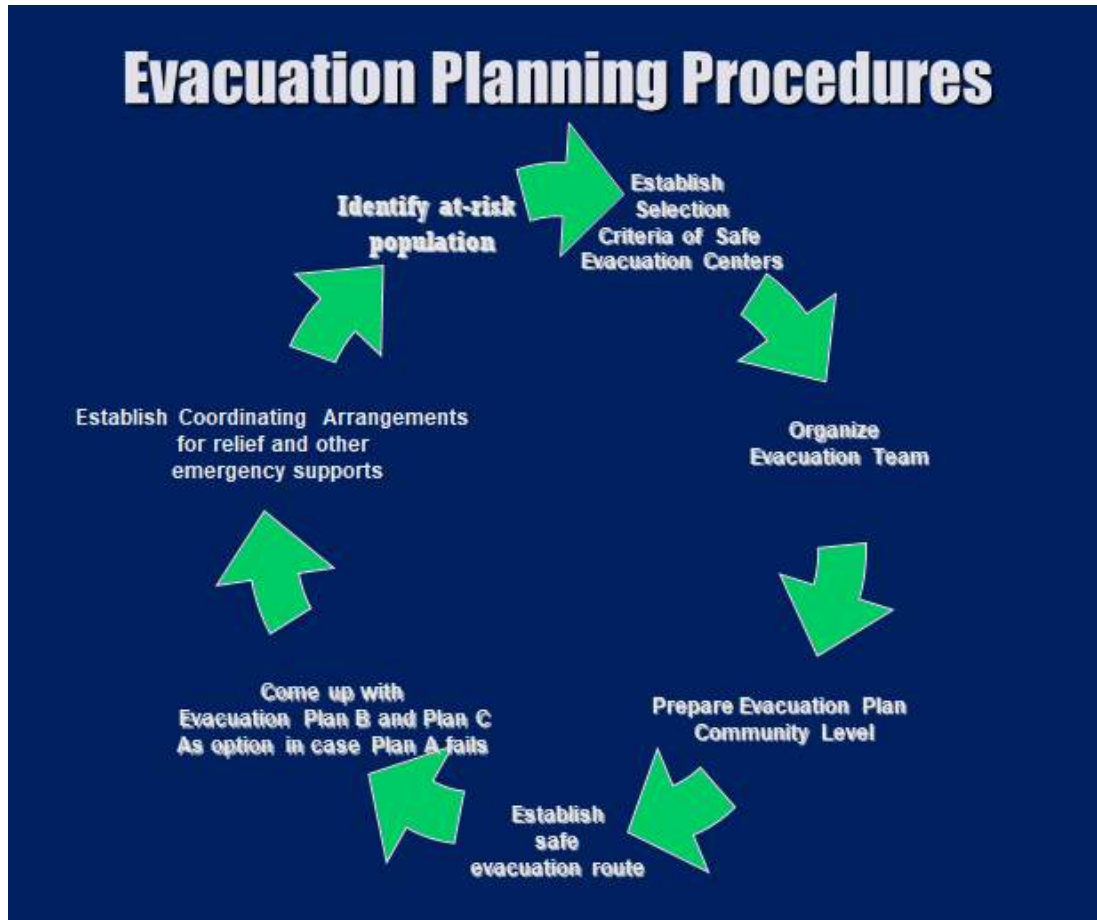


Fig. 23 APSEMO/PDRRMC evacuation planning flow and procedures

3. Organize evacuation team

Mobilizing the at-risk population requires proper planning and logistical support in terms of transportation and movement coordination. An evacuation team must be formed to identify pick-up sites, transportation modes, ensure safe routes, to and fro the evacuation center. As much as possible, there should be protection and inclusion-trained team members that will provide assistance to persons with disabilities, women and children, including senior citizens.

4. Prepare evacuation plan at the community level

For barangays that have many puroks or neighbourhoods, preparing an evacuation plan at the community level is helpful especially if there is no need to evacuate an entire barangay. It is also easier to manage in terms of scale, and the BDRRMC can customize or prepare the evacuation according to the communities' at-risk population, topography or physical characteristics, needs, culture, and other considerations.

5. Establish safe evacuation route

Access to shelter locations (evacuation centers): existing or new access routes should avoid proximity to any hazards. Where possible, such routes should also avoid creating isolated or screened areas that could pose a threat to the personal safety of users. (Sphere)

6. Come up with evacuation Plan B and Plan C in case Plan A fails

Prepare alternative plans in case of changing conditions, situations and worsening hazard events. Planning for different scenarios through simulation exercises and drills can bring about various strategies for evacuation.

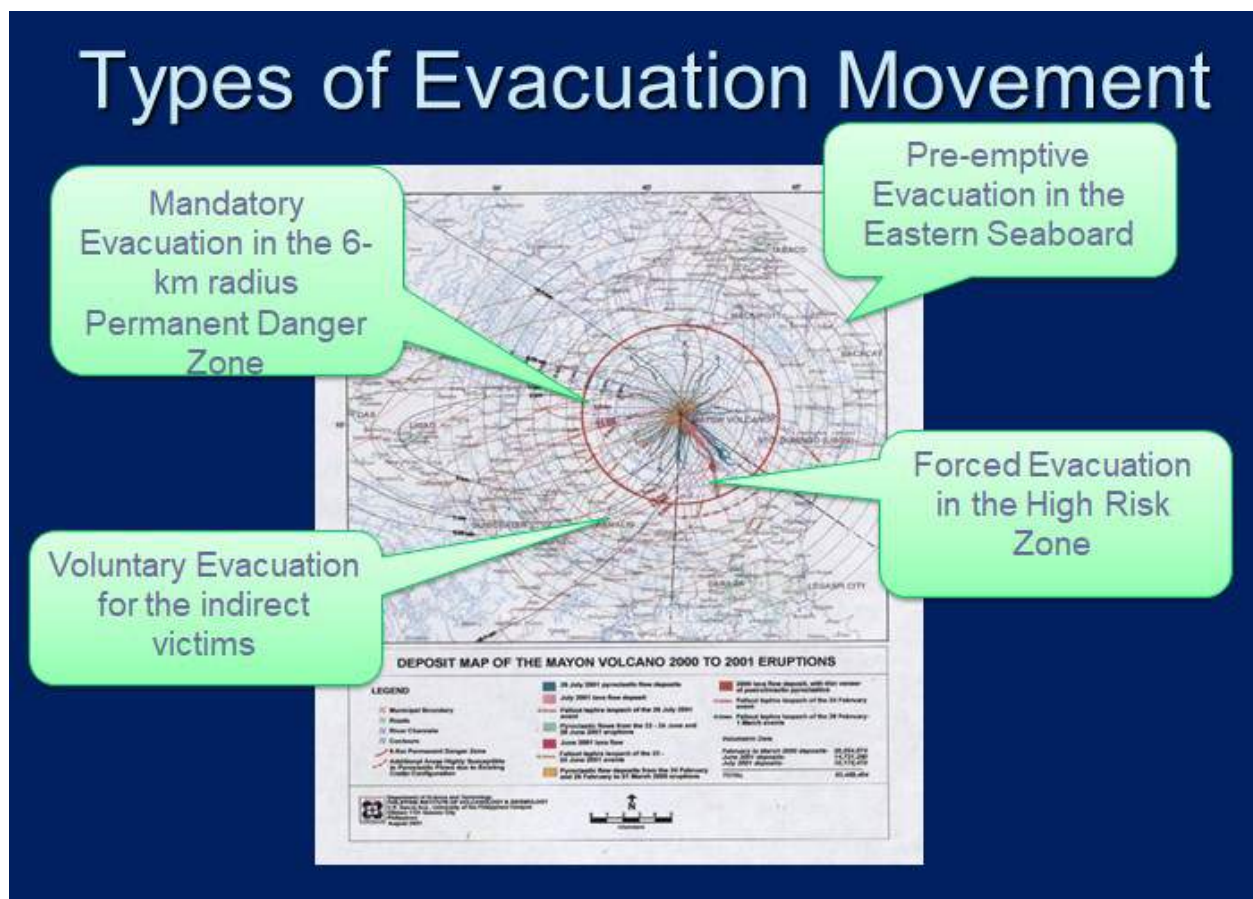


Fig. 24 Types of evacuation movement according to Mayon Volcano eruption alert level warning

7. Establish coordinating arrangements for relief and other emergency supports

Share information and report on important issues among relevant actors at national, provincial, district and local levels - including the government authorities, humanitarian aid agencies and other service providers. Coordinate with different stakeholders in order to ensure a comprehensive response that meets the needs of the displaced population. (Sphere)

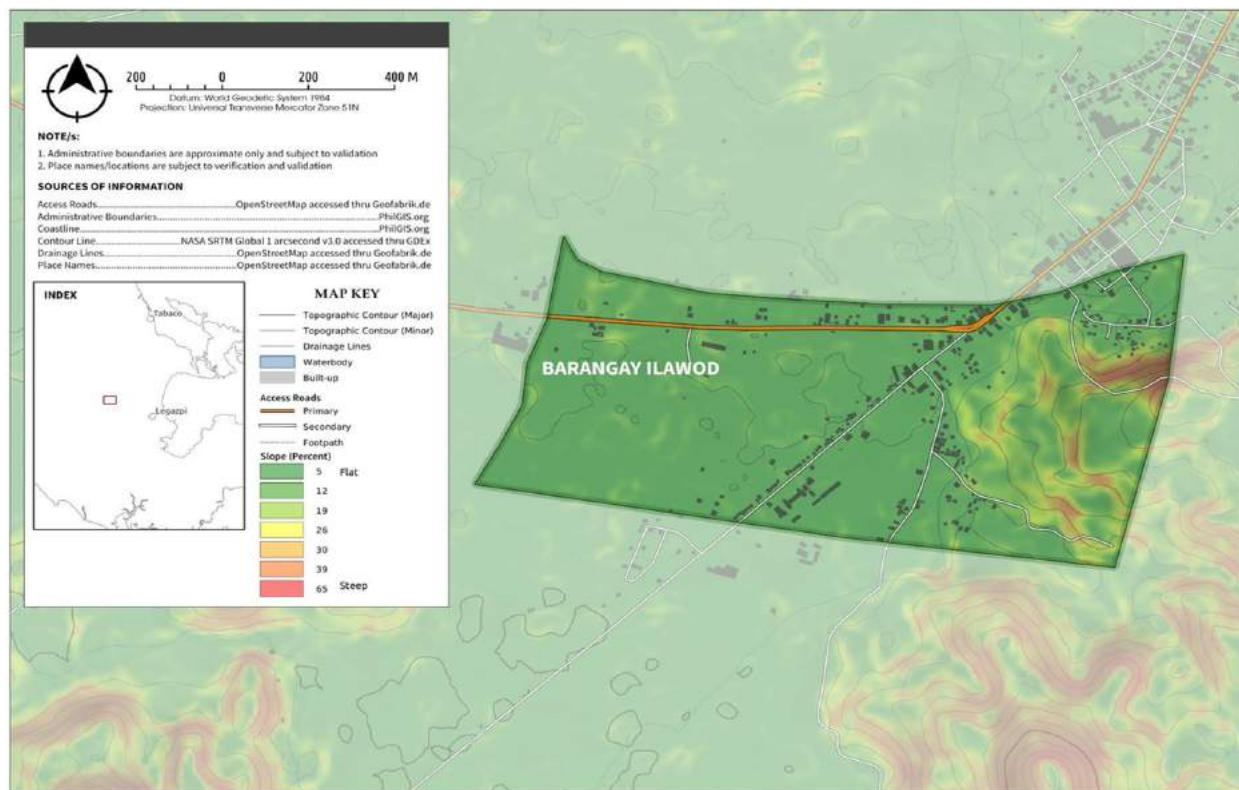


Fig. 25 Slope map of Barangay Ilawod in Camalig. Processed satellite image produced built up features which represent buildings and other infrastructures. These were integrated with the slope data to identify which buildings are in flat or steep areas. Flat areas tend to be flood-prone while steep areas tend to be landslide prone.

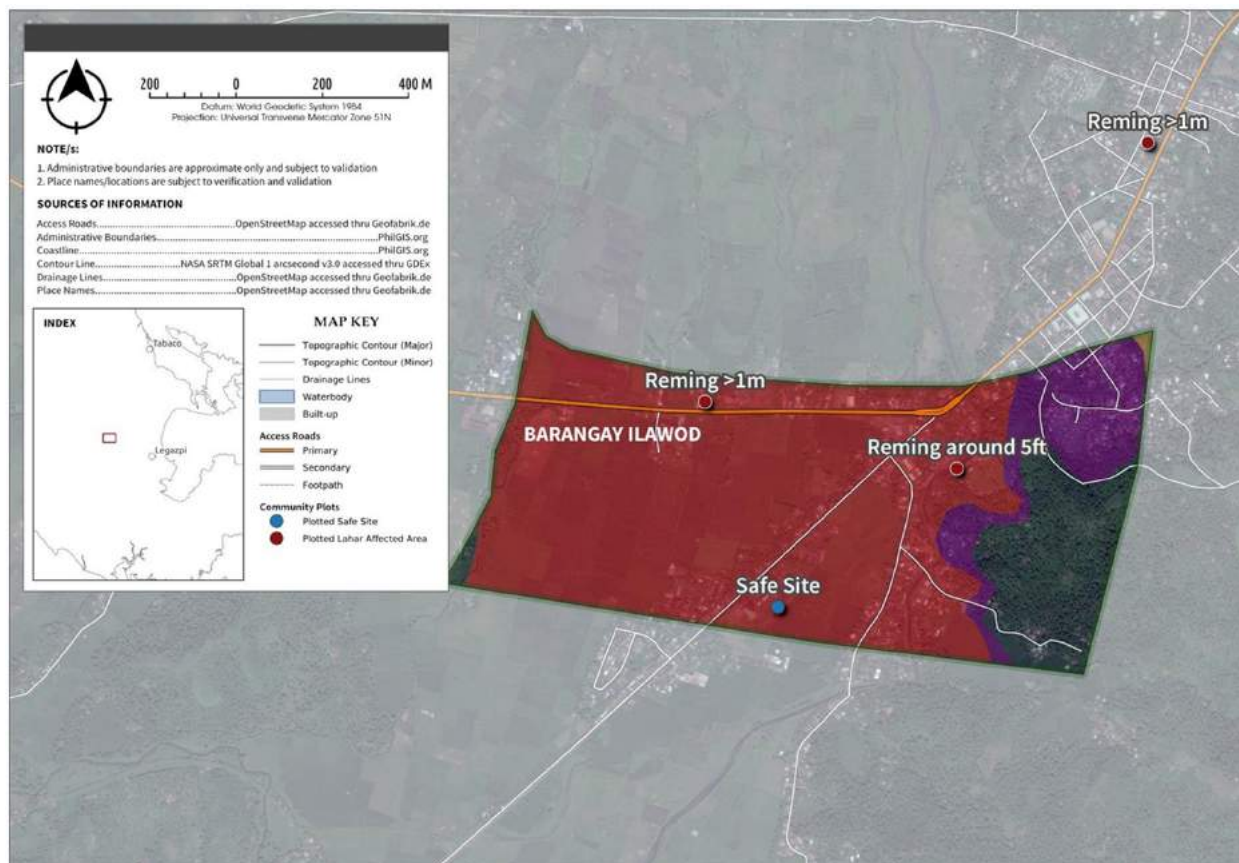


Fig. 26 Community plotted historical events and PHIVOLCS hazard map for Barangay Ilawod, Camalig. It shows that even those they considered safe sites are actually unsafe.

Basic Requirements for an Effectuated Early Warning System and Evacuation Procedures

- Risk Map.
- Institutional Capacity
- Technical and Physical Capacity
- Legislative Support
- Hazard and Area Specific Action Plan by Warning Level
- Drills and Exercises



Fig. 27 Illustration of operational coordination between the APSEMO/PDRRMC Disaster Operation Center and other stakeholders during an alert or emergency

Synthesis

Planning and creating an evacuation plan is imperative in achieving zero casualties. Identifying at-risk, population, conducting a needs analysis, identifying safe sites and routes for evacuation can only be done if a team in charge of evacuation is established.

Proper coordination of the basic needs of the evacuees with the help and support of humanitarian organizations and other external support as a stop gap mechanism will ensure continued support for the affected population as they wait for decampment.

Protection, gender and inclusion should also be considered not just in the evacuation center but even during mobilization. This includes facilitating support for persons with disabilities, protection for women and children against harassment, and that at-risk population are supported without discrimination or preferential treatment.

Session 2: Inclusive Evacuation

Introduction

Vulnerable people (Older people, women and children etc....) and persons with disabilities faced several obstacles in physical environment which led to limited participation and sometimes may cause additional impairment. Because of their limited mobility and sensory impairment they might need assistive devices to get out and access services. Persons with disabilities are often deprived because of inaccessible environment and communication means. Though accessibility law (BP 344) demands strict compliance that all public and private are designed so all including persons with disabilities can easily and safely reached by all. The accessibility also demand removal of barriers and provide reasonable accommodation in order to ensure persons with disabilities equal access and full participation.

Accessibility like participation is also a broad term and is understood in many different ways. A common misconception is that accessibility is only about physical access; however this is a very limited viewpoint, as many people with disabilities will have different access requirements. For example, someone who is visually impaired and requires accessible reading material differs from someone who is hearing impaired who requires a sign language interpreter. At policy and legal levels there may be barriers, or indeed lack of legal provisions related to accessibility. When considering accessibility, the key take away message is – creating a barrier free environment for everyone is very important to disability-inclusive development because a society accessible for persons with disabilities is one accessible to all (Aging and Disability Task Force (ADTF), draft accessibility guide).

Note to the facilitator

Facilitator will explain the definition of an accessible evacuation camp has the following elements:

1. Universal Design Concept Accessibility Law or BP 344-compliant
2. Accessible Water and Sanitation and Hygiene (WASH)
3. Inclusive and Adapted Shelters
4. Basic Minimum requirements as per BP 344
5. Lecture on 16 Minimum requirement for building accessible
6. Inclusive Evacuation Center Lead time for evacuation

Activity

The facilitator divides the participants into 3 groups (in 10 mins). Facilitator will ask the participants to answer the following questions:

- Minimum standard on accessibility
- Observation on their current evacuation center answering the checklist

1. Facilitator will ask each group to assign one person (in 5 mins) to present in the plenary;
2. The facilitator will explain that if the evacuation areas do not fit the criteria mentioned, what are our options? We can consider identifying privately owned establishments and residences for evacuation. We can also modify our evacuation camp or plan to develop more sites to accommodate all evacuees. This is a long-term option which might need external assistance and financial support;
3. Facilitator explains briefly about accessible evacuation camp: refers to safe and secure access to and use of shelters and essential services and facilities. It includes physical accessibility in terms of design and construction of the shelter as well as access to information and communication. All members of disaster and affected population are entitled to shelter services and facilities that offer assistance and protection.
4. Facilitator explain the 16 Minimum Requirements for Building Accessible Evacuation/Shelters (CBM, 2014);
5. Facilitator divided the participants into 3 groups (same group) to review again their checklist and reflect on their answer according to the presentation of 16 minimum standards.
6. Workshop on inclusive evacuation checklist

Synthesis

Accessible evacuation center refers to safe and secure access to and use of shelters and essential services and facilities. It includes physical and communication accessibility in terms of design and construction of the shelter as well as access to information and communication. An accessible evacuation center is composed of the following elements:

1. Universal Design Concept
2. Accessibility Law or BP 344 for buildings and facilities for public use
3. Accessible Water and Sanitation and Hygiene (WASH)
4. Inclusive and Adapted Shelters

Accessibility begins at the planning stage, therefore Accessibility Law (BP 344) provisions should be incorporated for safety and security of all, particularly the older people, persons with disabilities, children and women in evacuation plan. when planning an evacuation center the following are guide:

1. Accessibility: The built environment shall be designed so that it shall be accessible to all people. This means that no criteria shall impede the use of facilities by either the handicapped or nondisabled citizens,
2. Reachability: Provisions shall be adapted and introduced to the physical environment so that as many places or buildings as possible can be reached by all
3. Usability: The built environment shall be designed so that all persons, whether they have disabilities or not, may use and enjoy it
4. Orientation: Finding a person's way inside and outside of a building or open space shall be made easy for everyone
5. Safety: Designing for safety insures that people shall be designed to allow people with disabilities to participate and contribute to developmental goals

MODULE 4: Scenario-Based Contingency Planning and Table Top Exercise

Description

This session will allow participants to enhance their community evacuation plan for lahar hazard by ensuring that specific needs of vulnerable people and persons with disabilities are addressed. This requires appropriate preparation and planning prior to lahar. Vulnerable people, including persons with disabilities and their families must be included in the preparedness phase so that their specific needs are understood and appropriate responses can be implemented. This session will provide the communities scenarios on the severity of their risk exposure to lahar hazard for appropriate action and preparedness activities.

Key Message

- Communities are the first responders and people and communities affected by crisis should be at the center of preparedness and response actions.
- Local DRR actors are accountable to the communities they are serving so it is important that they have a good understanding of quality and accountability standards to guide them in their work.
- It is a must that we create a community-based lahar contingency plan that serves as reference in achieving zero casualties. It involves working with others and sharing resources and capacities to address the differentiated needs of the vulnerable population including persons with disabilities. The community will be empowered when all local sectors, groups and individuals had common understanding on the respective roles and accountabilities in realizing zero casualties for lahar hazard.

Objectives

1. For the participants to appreciate the importance of crafting a community based, scenario-based contingency plan.
2. To develop a customized lahar contingency plan specific to the needs, risk of the vulnerable population.
3. To increase the level of confidence of community actors through strengthened institutional and technical capacities.
4. To encourage the community to be more proactive rather than complacent by providing them hazard visualization and impact scenarios.
5. To test the knowledge, efficiency, readiness of the community to prepare for lahar hazard.
6. To improve or enhance the existing contingency plan and formulate a final one.

Learning Outcomes

The participants are able to create a lahar-based contingency plan that identifies the roles of each member of the BDRRMC and MDRRMC and their corresponding task units.

References

- Lahat Handa
- IFRC Contingency Planning Guide

Session 1: Lahar Risk Contingency Planning

Introduction

Lahars are rapid and destructive in nature, with its both solid and liquid composition of debris, water, rocks, and mud among others. This module focuses on secondary lahar or post-eruption lahar deposits triggered or induced by heavy rainfall. Because of its speed and composition, its potential impacts are far reaching and thus require a combination of strategies that involve the scientific community, the at-risk communities, and other stakeholders involved in planning, strategizing, and addressing the impacts of lahar if it is not totally avoidable.

Creating a contingency plan that is hazard and scenario-based is important in lahar risk reduction and achieving zero casualties.

Key Concepts

Contingency planning aims to prepare an organization to respond well to an emergency and its potential humanitarian impact. Developing a contingency plan involves making decisions in advance about the management of human and financial resources, coordination and communications procedures, and being aware of a range of technical and logistical responses. Such planning is a management tool, involving all sectors, which can help ensure timely and effective provision of humanitarian aid to those most in need when a disaster occurs. Time spent in contingency planning equals time saved when a disaster occurs. (IFRC)

The contingency planning process can basically be broken down into three simple questions:

- What is going to happen?
- What are we going to do about it?
- What can we do ahead of time to get prepared?

These questions can only be answered through proper planning and preparation. The following activities will help assess the preparedness of the barangay or community in addressing the risks posed by lahar. The outputs from these activities can serve as reference as they develop their own lahar contingency or preparedness plan.

Activity: Community Inputs

The participants will be grouped according to affiliation and provide data on the total number of population at risk and identify evacuation centers specifically in barangays exposed to lahar hazard. Each group will be provided with a manila paper and asked to post their outputs afterwards for presentation.

PUROK NO.	POPULATION AT RISK			EVACUATION CENTERS				
	NO. OF HOUSEHOLDS	NO. OF FAMILIES	NO. OF PERSONS	SCHOOL (HS/ELEM)	PRIVATE HOUSES	PASTORAL CENTER	BRGY. CHAPEL	MULTI-PURPOSE BUILDINGS
TOTAL:								

Table 4 Matrix of disaggregated data from the barangay that are essential in evacuation planning.

Activity: Task Units

This activity will show how organized the M/BDRRMC task units that consists of committees on warning, communication, transportation, security, health, evacuation, and relief. Have each barangay or group present their outputs as follows:

Task Units/ Committees	Warning Level Activities			Person in Charge	Roles & Responsibilities
	1	2	3		
Warning					
Communication					
Transportation					
Security					
Health					
Evacuation					

Table 5 Matrix of specific task units activated before, during, and after evacuation.

Synthesis

Contingency planning ahead of time and according to lahar risk exposure can help successfully implement measures to keep at-risk population safe from lahar hazards. This includes development of lahar warnings systems that can enable evacuation of at-risk population.

Lahar is a rapid and far-reaching hazard, thus, a barangay or community must have a plan to reduce its risk or avoid it through evacuation. If a barangay has the capacity to mobilize teams and committees, they can coordinate the implementation of the contingency plan towards successful evacuation. Committees or task units must be oriented and trained to perform their roles and responsibilities. They should have specific roles and functions and no duplication of handled committee.

Each hazard should have separate contingency plan. Every after disaster, contingency plans must be reviewed and modified if necessary. Conducting periodic simulation exercises and drills will help retain the institutional and muscle memories of task unit members; and improve their readiness to prepare for and respond to lahar hazards.

Session 2: Inclusive Contingency Planning

Introduction

Inclusive contingency planning will ensure the participation and access to essential services of the most vulnerable persons and persons with disabilities from the humanitarian response to lahar. Inclusive CP approach should be coherent with protection principles as meaningful access, accountability and participation, supports the promotion of local/national and international initiatives as Protection Mainstreaming, and could include, but not be limited to, Disability, Age and Gender (DGA) inclusion.

To achieve this goal, Lahar Anticipation consortium team follows a twin track approach for inclusive programming, encompassing:

(Track 1) Promote an inclusive system for all, with general, support and specialized services: Facilitating the inclusion of children, older persons and persons with disabilities in an inclusive system for example include vulnerable sector during planned activities (e.g. search, rescue and evacuation, contingency planning, designing of early warning systems, etc.), policy levels is ensured, plans are adopted according to the specific needs of vulnerable sector (inclusion in risk assessment) which focuses on making general services accessible to all by removing barriers and inequalities.

(Track 2) Enhance empowerment through targeted initiatives for capacity building on leadership, communication, CBDRRMC: Implementation of specific actions for older people, children and persons with disabilities “empowerment”, this means that they are empowered to participate in all DRRM activities and decision-making. Their capacity to participate and act effectively in the event of a disaster should be reinforced through targeted training and skills building, provision of assistive devices, rehabilitation and other relevant measures.

Key Concepts

Having identified, assessed, and analyzed the hazards and risks in the community, the next step is for the BDRRMC members to seek the inputs and support of the people in identifying barangay programs, projects, and activities (PPAs) to reduce and manage these risks. The people should be part of the planning process so that they could readily cooperate and provide support in the implementation of the plan. Such would also ensure the sustainability of DRRM efforts since it has the support of the people

In the discussion facilitator asks the participants their experience in developing CP and how they ensure the participation of all, especially women, youth, older people, persons with disabilities.

Facilitator explains the importance of Inclusive Community-Managed Implementation. Once the CBDRRMC Plan is finalized and approved, the BDRRMC should again solicit the support and participation of the people (through membership in sub-committees) when the plan is implemented.

Finally facilitator should remind participants regarding the Inclusive Monitoring and Evaluation. This step likewise necessitates the involvement of community members in keeping track of the progress of the CBDRRMC plan and in determining if planned objectives are being met. Such would enable the BDRRMC to make corrective or remedial measures in the plan that are supported by community residents.

Activity

- Facilitator will group the participants in an equal number and or group according to LGUs/Barangay, and the facilitator will ask each group to answer and discuss the question, provide answer according to best knowledge of the participants: explain why CP need to be inclusive, what are the steps and how to make CP inclusive;
- Each group can present a summary through a chosen representative;
- Facilitator will process all collected information and make use of this later in classifying outputs to session summary;
- Facilitator provide inputs on the following: warning, communication, evacuation, health, transportation
- Facilitator presents/explains different elements on how to ensure CP is inclusive link to inclusion standards.

- Facilitator summarize the 5 CP components into inclusion standards, facilitators empathize the use of two way communication (verbal and none verbal), the importance of accessibility standards embedded to evacuation centers development and planning, reasonable accomodation in transportation, inclusive protection and advocacy on data based (promoting Washington group of questions (WGQ), Disability , Age and Gender) and inclusion of possible mobility and assistive devices (appropriate devices), including capacity building of personal assistant, family members, caregivers and volunteers.

Synthesis

The Humanitarian inclusion standards for older people and people with disabilities are designed to help address the gap in understanding the needs, capacities and rights of older people and people with disabilities, and promote their inclusion in humanitarian action and with relevance to CHS

The Humanitarian inclusion standards for older people and people with disabilities consist of nine Key inclusion standards, derived from the Nine Commitments of the Core Humanitarian Standard on Quality and Accountability (CHS), and seven sets of sector-specific inclusion standards: protection; water, sanitation and hygiene; food security and livelihoods; nutrition; shelter, settlement and household items; health; and education (source: ADCAP Project)

Session 3: Table-Top Exercise

Introduction

Lahar hazards change depending on varying conditions and current activity of Mayon Volcano. It is important for the lahar-exposed communities to visualize the severity of hazards associated with lahar for them to appreciate the importance of preparedness in achieving zero casualties. Disaster imagination using different scenarios is key for communities to formulate strategies to prepare for possible effects of lahar hazards.

Key Concepts

The following table shows the weather phenomena that may cause heavy or extreme rainfall and trigger lahar. It also shows the threat level if rainfall accumulates over a prolonged period. This is important in developing a warning system and anticipating risk

WEATHER PHENOMENA THAT MAY TRIGGER LAHAR	CAUSES LAHAR		LEVEL OF THREAT
	YES	NO	
Thunderstorm		/	0
Northeast Monsoon	/		Low to moderate
Southwest Monsoon	/		Low to moderate
Tail End of Cold Front	/		Moderate to high
ITCZ	/		Moderate to high
Active Low Pressure Area	/		Moderate to high
Tropical Depression	/		Moderate to high
Tropical Storm	/		Moderate to high
Severe Tropical Storm	/		Moderate to high
Typhoon	/		Moderate to high
Severe Typhoon	/		Moderate to high

Table 6. List of weather phenomena that may trigger lahar and their threat level.

Below is the table showing lahar mudflow warning level and its corresponding criteria, interpretation and action required from local government units. This will serve as a guide in developing a warning system, creating communication protocol, and advisories for the communities.

LAHAR WARNING LEVEL	CRITERIA	INTERPRETATION	ACTION REQUIRED
0	No rain (traces)	Normal	Prepare
1	15-20mm/h cumulative rain	Abnormal	Assign BDRRMC committees
2	25-30 mm/h	Alarming	Emergency meeting, suspension of classes of affected, activation of MOP centers
3	35-40mm/h	Critical action	Execution of evacuation plan
4	60mm/h	Destructive	Safe

Table 7 Lahar warning criteria and their corresponding criteria, interpretation and required actions.

Tabletop Exercise

The following scenarios correspond to lahar mudflow warning system and their corresponding required actions. Participants will be asked to fill out their roles and responsibilities for each scenario.

SCENARIO	WHAT WILL YOU DO?
As of 5am today, July 4, 2019, based on satellite and surface data, Typhoon Sisang with 600km in diameter is located at 310km Southeast of Legazpi City with strength of 220kph sustained wind up to 250kph gustiness moving 10km/hour Northwest. Rainfall expected is 27-32mm in 24 hours but as of 11am APSEMO announced that based from the rain gauge, rain fall reached 25mm/hour.	<ul style="list-style-type: none"> • Emergency meeting of M/BDRRMC and different task units. • Activation of Disaster Operation Center • Prepositioning of food and non-food items. • Suspension of classes • Planning how the evacuation plan be executed. • All must be in a safe place
As of 12nn , APSEMO issued advisory No. 2 declaring suspension of classes and recommended preparedness since the sustained wind reached 300kph and rainfall monitoring reached 35mm/hour according to rain gauge.	<ul style="list-style-type: none"> • Preparedness • Suspension of classes • Emergency advisories to execute. • Execution of evacuation plan within a prescribed period of time. • Coordination to BDRRMC and task unit especially the transportation and communication units. • People must be in a safe place. • Relief operations
As of 12:25pm with 290km/hour rainfall reached to 42mm/hour.	<ul style="list-style-type: none"> • Forced evacuation • Everybody is safe in the evacuation centers. • Wait for further advisory
As of 8am of July 5, 2019, PAGASA advised 32km/hour Northwest with rainfall of 15mm/hour. Typhoon going away from Legazpi City.	<ul style="list-style-type: none"> • Decampment announcement

What will you do?

- Identify the impacts and effects of lahar
- Identify/review the population affected
- Review the roles and responsibilities of BDRRMC and MDRRMC
- Enumerate actions to be taken by each task unit of the BDRRMC based on the scenario and contingency plan developed

Synthesis

Lahar can cause casualty including death, injured, and missing and damage on resources such as water system, electricity, houses, roads, and agricultural resources. Determine whether the typhoon is severe or not, if severe, wait the typhoon to enter the Philippine Area of Responsibility (PAR).

Inside PAR, typhoon can be;

- 1 = direct hit. There's a need to prepare for all the hazard.
- 2 = not direct hit but within the strong winds.
- 3 = outside of strong wind but within the rainband.
- 4 = outside of circulation and passing through the North with the wind coming from the Southwest. (can be developed into Southwest Monsoon)
- 5 = outside of circulation and passing through the South when the wind is from the Northeast. (can be developed into Northeast Monsoon)
- 6 = complex hazard/multiple hazard.

MODULE 5: Local Disaster Governance and Core Humanitarian Standards

Description

Republic Act 10121 or the Philippine Disaster Risk Reduction and Management (PDRRM) Act of 2010 is 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.

It aims to strengthen the country's National DRRM System towards sustainable economic development, by mainstreaming the same in all national and local development processes. It mandates the establishment of LDRRMOs in provinces, cities, and municipalities, and BDRRMCs in barangays.

“The Core Humanitarian Standard (CHS) on Quality and Accountability sets out nine commitments that organizations and individuals involved in humanitarian response can use to improve the quality and effectiveness of the assistance they provide.” (CHS Alliance, 2014)

CHS is anchored on the four humanitarian principles and the belief of the humanitarian charter that all people affected by disaster or conflict have a right to receive protection & assistance to ensure the basic conditions for life with dignity. The nine commitments put premium and focus on (1) context, (2) service delivery, communication, and coordination, and (3) organization systems and support.

Key Message

The DRRM Act provides a responsive and proactive manner of addressing disasters through a framework that:

- Prioritizes on community level DRRM focusing on the most vulnerable sectors (i.e., the poor, the sick, people with disabilities, the elderly, women and children)
- Recognizes the important role and strengthens capacities of local communities
- Ensures broad-based and greater participation from Civil Society
- Addresses root causes of disaster risks

By putting the communities and people affected by disaster or crisis at the center of any humanitarian assistance, knowledge about the CHS commitments can guide participants on how to improve the quality, accountability and effectiveness of their humanitarian assistance. While achieving these commitments can be challenging in the LGU set-up, these commitments are non-negotiable.

Objectives

1. Discuss the salient points of RA 10121 especially sections that enables a proactive local disaster governance
2. Identify the roles and responsibilities of the MDRRMC and BDRRMC in local disaster governance
3. Discuss the rationale of the Core Humanitarian Standard;
4. Explain the nine commitments of CHS; and
5. Give specific examples how the participants can implement the CHS commitments in the local context.

Learning Outcomes

At the end of the session:

1. Have a better understanding of RA 10121 and including their roles and responsibilities in the MDRRMC and BDRRMC
2. Implement local disaster governance and disaster risk reduction as mandated by RA 10121
3. Focus on reducing risk in their communities especially among the vulnerable sectors
4. Identify themselves as local humanitarian workers;
5. Know that the center of what they do as humanitarian workers are the communities and people affected disaster or crisis;
6. Identify ways how they can/will implement the CHS commitments; and
7. Be willing to uphold the CHS commitments despite the challenges and constraints in the local setting.

References

- CHS Alliance. 2014. Core Humanitarian Standard on Quality & Accountability (1st ed.).
- CHS Alliance, Group URD, & the Sphere Project.
- Republic Act 10121-DRRM Law of the Philippines

Session 1: Local Disaster Governance

Introduction

The Philippines' DRRM vision for safer, adaptive and disaster-resilient Filipino communities toward sustainable development can only be achieved through a paradigm shift from reactive to proactive; DRRM wherein men and women have increased their awareness, understanding on DRRM with the end in view of increasing people's resilience and decreasing their vulnerabilities.

This can be done through proper local disaster governance as mandated by RA 10121 or the DRRM Law of the Philippines that enables and empowers actors from the local government units to mitigate, prepare, respond, and recover from disasters. The whole of society approach is encouraged to ensure that the all-encompassing effects of disasters can be reduced through planning and investing in risk reduction measures and empowering communities towards resilience through participation and bottom-up approach.

Key Concepts

Disaster

A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

Disaster Risk

The potential disaster losses in lives, health status, livelihood, assets and services, which could occur to a particular community or a Society over some specified future time period.

Vulnerability

The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

Vulnerability may arise from various physical, social, economic, and environmental factors such as poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management.

Disaster Risk Reduction

The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposures to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

The Philippine DRRM Framework

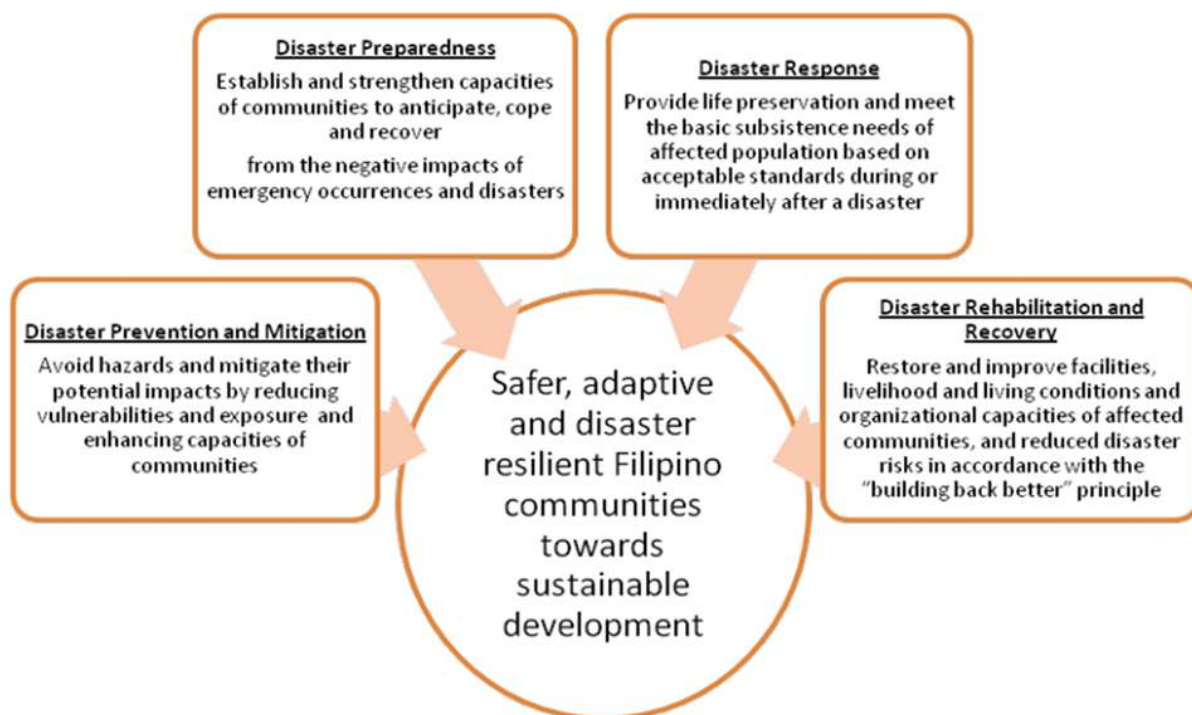


Fig. 28 The Philippine DRRM Framework which shows the four thematic areas or phases of disaster management.

Guidelines in Local Disaster Governance

Implementing Guidelines for the Establishment of Local DRRM Offices (LDRRMOs) or Barangay DRR Committees (BDRRMCs) in LGUs (NDRRMC, DILG, DBM, and CSC: JMC 2014-1, April 4, 2014)

Section 12 of RA 10121

(a) There shall be established an LDRRMO in every province, city, and municipality, and a BDRRMC in every Barangay which shall be responsible for setting the direction, development, implementation and coordination of disaster risk management programs within their territorial jurisdiction; and

(b) The LDRRMO shall be under the office of the governor, city or municipal mayor, and the punong barangay in case of the BDRRMC. The LDRRMOs shall be initially organized and composed of a DRRMO to be assisted by three (3) staff responsible for: (1) administration and training; (2) research and planning; and (3) operations and warning. The LDRRMOs and the BDRRMCs shall organize, train and directly supervise the local emergency response teams and the accredited community disaster volunteers (ACDVs).

Section 76 of RA 7160 (Local Government Code of 1991)

Every LGU shall design and implement its own organizational structure and staffing pattern taking into consideration its service requirements and financial capability, subject to the minimum standards and guidelines prescribed by the Civil Service Commission (CSC).

Section 83 of RA 10352 (General Appropriations Act FY 2013)

(Par. 5) Enforcement of Sections 325(a) and 331(b) of RA 7160 shall be waived to enable LGUs to fund the initial year requirements for newly created mandatory positions in LGUs, as confirmed by the Department of Budget and Management (DBM), for the initial year of such creation.

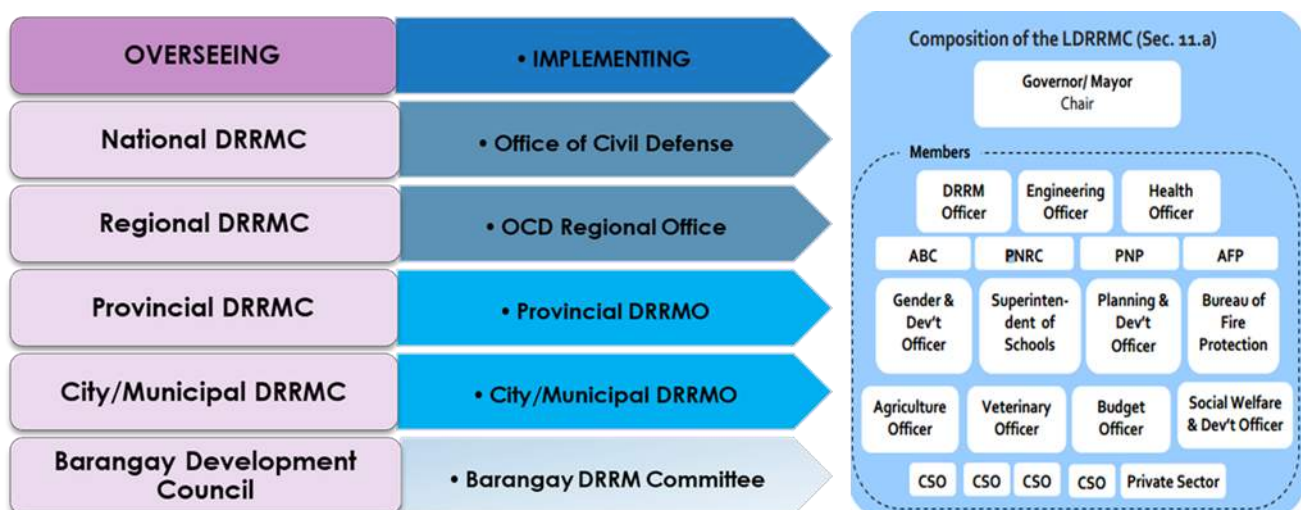


Fig. 29 The organizational composition of the members of the DRRM council from the national to the local and barangay levels

Formulation of the Local DRRM Plan

Formulate and implement a comprehensive and integrated LDRRMP in accordance with the national, regional and provincial framework, and policies on disaster risk reduction in close coordination with the local councils (LDCs)

Prepare and submit to the local sanggunian through LDRRMC and the LDC the annual LDRRMO Plan and budget, the proposed programming of the LDRRMF, other dedicated disaster risk reduction and management resources, and the regular funding source/s and budgetary support of the LDRRMO/BDRRMC

What will guide the DRRM implementation?

National DRRM Framework (NDRRMF)

- Principal guide to disaster risk reduction and management efforts in the country

National DRRM Plan (NDRRMP)

The NDRRMP shall be formulated and implemented by the Office of Civil Defense (OCD) (Sec. 3.z and Sec. 9.b). The NDRRMP sets out goals and specific objectives for reducing disaster risks. This includes:

- a) identification of hazards, vulnerabilities and risks to be managed at the national level;
- b) DRRM approaches and strategies to be applied in managing said hazards and risks;
- c) agency roles, responsibilities and line of authority at all government levels; and,
- d) vertical and horizontal coordination of DRRM in the pre-disaster and post-disaster phases.

Local DRRM Plans (LDRRMP)

The Local DRRM Plan will guide DRRM implementation at the local level. The LDRRMP will be formulated by the LDRRMOs/BDRRMC in close coordination with the local development councils. (Sec. 12.c.6)

Important Outputs:

- Hazard characterization and areas at risk, and impacts of disaster and climate change scenarios
- Elements at risk and potential damage
- Vulnerability and capacity assessment of elements at risk
- Measures to reduce vulnerability and enhance capacity of elements at risk
- AIP for program implementation and budget utilization and allocation
- Monitoring & evaluation plan

Funding Streams

At the national and local levels, the following sources can be tapped to fund the LDRRMP:

1. General Appropriations Act (GAA) – through the existing budgets of the national line and government agencies
2. National Disaster Risk Reduction and Management Fund (NDRRMF)
3. Local Disaster Risk Reduction and Management Fund (LDRRMF)
4. Priority Development Assistance Fund (PDAF)
5. Donor Funds
6. Adaptation and Risk Financing
7. Disaster Management Assistance Fund (DMAF)

Budget Allocation and Utilization



Fig. 30 Local DRRM fund allocation (Image from Rappler)

Declaring State of Calamity

The National Council shall recommend to the President of the Philippines the declaration of a cluster of barangays, municipalities, cities, provinces, and regions under a state of calamity, and the lifting thereof, based on the criteria set by the National Council. The President's declaration may warrant international humanitarian assistance as deemed necessary.

The declaration and lifting of the state of calamity may also be issued by the local sanggunian, upon the recommendation of the LDRRMC, based on the results of the damage assessment and needs analysis.

- Barangay – 1 sitio/purok affected
- City/Municipality – 2 barangays affected
- Province – 2 cities/municipalities affected
- Region – 2 provinces affected
- Nationwide – 2 regions affected

Prohibitions and Penalties

1. Dereliction of duties which leads to destruction, loss of lives, critical damage of facilities and misuse of funds
2. Preventing the entry and distribution of relief goods in disaster-stricken areas, including appropriate technology, tools, equipment, accessories, disaster teams/ experts
3. Buying, for consumption or resale, from disaster relief agencies any relief goods, equipment or other aid commodities which are intended for distribution to disaster affected communities
4. Buying, for consumption or resale, from the disaster affected recipient any relief goods, equipment or other aid commodities received by them
5. Selling of relief goods, equipment or other aid commodities which are intended for distribution to disaster victim
6. Forcibly seizing relief goods, equipment or other aid commodities intended for or consigned to a specific group of victims or relief agency
7. Diverting or misdelivery of relief goods, equipment or other aid commodities to persons other than the rightful recipient or consignee
8. Accepting, possessing, using or disposing relief goods, equipment or other aid commodities not intended for nor consigned to him/her
9. Substituting or replacing relief goods, equipment or other aid commodities with the same items or inferior/cheaper quality
10. Misrepresenting the source of relief goods, equipment or other aid commodities by:
 - a. Either covering, replacing or defacing the labels of the containers to make it appear that the goods, equipment or other aid commodities came from another agency or persons
 - b. Repacking the goods, equipment or other aid commodities into containers with different markings to make it appear that the goods came from another agency or persons or was released upon the instance of a particular agency or persons
 - c. Making false verbal claim that the goods, equipment or other aid commodity in its untampered original containers actually came from another agency or persons or was released upon the instance or a particular agency or persons
11. Illegal solicitations by persons or organizations representing others as defined in the standards and guidelines set by the NDRRMC
12. Deliberate use of false or inflated data in support of the request for funding, relief

goods, equipment or other aid commodities for emergency assistance or livelihood projects

13. Tampering with or stealing hazard monitoring and disaster preparedness equipment and paraphernalia.

Penalties for committing the prohibited acts

Section 20 of the DRRM Act imposes the penalty of:

1. Fine between P50,000 to P500,000
2. Imprisonment between six months to one year
3. Both fine and imprisonment
4. Confiscation or forfeiture of the objects and instrumentalities used

For government officials, he/she shall be perpetually disqualified from public office in addition to the fine, imprisonment and confiscation.

For a corporation, partnership or association, or other groups, the penalty shall be imposed upon the officers.

Their licenses or accreditation can also be cancelled or revoked. For a foreigner, he/she can be deported after service of the sentence.

Synthesis

Disaster risk reduction and management is the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

Disaster resilience is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

According to the Hyogo Framework for Action, local disaster governance ensures that disaster risk reduction is a national and local priority with strong institutional basis for implementation. RA 10121 presents several mechanisms to ensure that risk reduction is the top priority for reducing the risk and vulnerabilities of communities to disasters and increase the capacity towards resilience.

Session 2: Core Humanitarian Standard

Introduction

Core Humanitarian Standard identifies nine commitments that organizations and individuals should practice and uphold in giving humanitarian assistance to communities and people affected by crisis or disaster. As actors and leaders in the communities tasked to manage disaster operations, it is necessary for the actors in the LGUs and communities to know about the CHS so they can make conscious efforts to improve the quality, accountability and effectiveness of how they deliver their humanitarian assistance for and with their constituents.

While discussing each commitment, the RP shall give specific examples contextual to the municipal and barangay set-up to deepen the understanding and appreciation of the participants. Moreover, these examples can be used by the participants as input in crafting their DRRM and contingency plans and projects in their respective areas of responsibilities.

Key Concepts

Session shall start by clarifying with the participants who the local humanitarian workers are. It shall be clear to them that they are the humanitarian workers in their respective municipalities and barangays. As local humanitarian workers, they must know, understand, and uphold the CHS.

To give participants a better appreciation of CHS, it is necessary to discuss first the Humanitarian Principles (humanity, impartiality, neutrality, and independence) and the Humanitarian Charter where the nine commitments are anchored. After discussing the rationale of CHS, the resource person (RP) shall also emphasize that the goal of CHS is to give quality and effective assistance to communities and people affected by crisis.

Nine commitments of the CHS are the following:

1. Communities and people affected by crisis receive assistance appropriate and relevant to their needs.

Quality Criterion: Humanitarian response is appropriate and relevant.

The conduct of needs assessment defines the type of response that will be delivered to the affected communities; at risk groups, vulnerable people has to be consulted so their specific needs may be addressed and communities and people affected by crisis receive assistance appropriate to their needs.

2. Communities and people affected by crisis have access to humanitarian assistance they need at the right time.

Quality Criterion: Humanitarian response is effective and timely

That preparedness is key in delivering a timely and effective response; that an organization should be mindful of its capacity and be able to strategically position itself within the response framework for an effective response. Apart from capitalizing on organizational capacities and strengths, technical standards serve as good reference in implementing effective and timely response. The technical chapters of Sphere Standards guides how we design our intervention in Food Security, WASH, Shelter and Non-Food Items, and Health Action.

3. Communities and people affected by crisis are not negatively affected and are more prepared, resilient and less at risk as a result of humanitarian action.

Quality Criterion: Humanitarian response strengthens local capacities and avoids negative effects.

The community should be the center of any humanitarian action. It is important that existing risk analysis and preparedness plans are utilized for a broad understanding of the context of the community to guide response initiatives. Resilience building can be imbedded in response through initiatives that promise longer term effects and reduces dependency.

4. Communities and people affected by crisis know their rights and entitlements have access to information and participate in decisions that affect them.

Quality Criterion: Humanitarian response is based on communication, participation and feedback.

The participation of crisis-affected people is vital. Encourage them to speak out and influence decisions. Information and communication must help people make the best decisions for themselves, instead of imposing something on them. This helps them take an active role in their own early recovery. Facilitating feedback and encouraging participation largely depends on how much the community knows about you and your organization.

5. Communities and people affected by crisis have access to safe and responsive mechanisms to handle complaints.

Quality Criterion: Complaints are welcomed and addressed.

People have the right to complain and receive a proper and well-timed reply to their complaint. This is vital to give people control over their lives and make agencies accountable. Agencies can be vulnerable to fraud or abuse of power and a complaints system helps them recognize this and take action

6. Communities and people affected by crisis receive coordinated and complementary assistance.

Quality Criterion: Humanitarian response is coordinated and complementary.

Coordination and interoperability provides a strong motivation for different actors to work together, minimising competition and promoting synergies. Choosing reliable, experienced, partners capable of delivering a quality programme, and approaching these partnerships in a strategic and respectful manner, will help enable a more effective response; affected communities should also be considered as partners in the response. Investing in processes to promote partnership, which might include measures such as the capacity building and certification of local NGOs (while taking care that these processes are not used for political ends), could also be useful.

7. Communities and people affected by crisis can expect delivery of improved assistance as organisations learn from experience and reflection.

Quality Criterion: Humanitarian actors continuously learn and improve

Knowledge is now recognized as a valuable intangible asset and the building of knowledge generation capabilities within an organization provides the organization with the flexibility to meet new challenges. A sound knowledge management and learning strategy is crucial in improving internal processes and systems, developing core competencies and designing innovative strategies

8. Communities and people affected by crisis receive the assistance they require from competent and well-managed staff and volunteers.

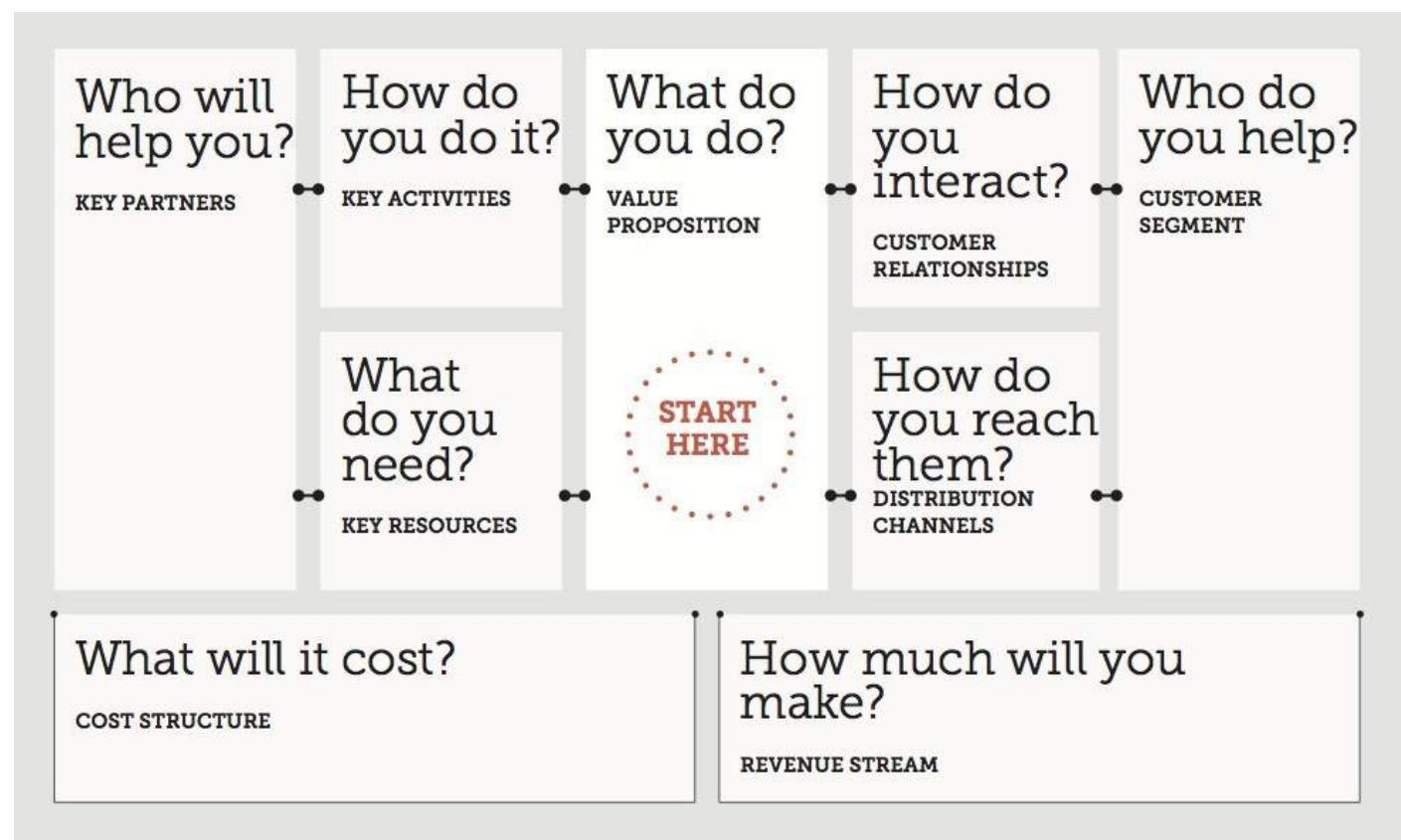
Quality Criterion: Staff are supported to do their job effectively, and are treated fairly and equitably.

Staff should be properly briefed and inducted on organizational mandate and values and should subscribe to a code of conduct. Performance of staff should be managed regularly to ensure fulfilment of objectives, allow adjustments according to context and situation and recognize good performance.

9. Communities and people affected by crisis can expect that the organisations assisting them are managing resources effectively, efficiently and ethically.

Quality Criterion: Resources are managed and used responsibly for their intended purpose.

An effective response is one that maximizes the use of resources to benefit the population in need. A well-defined policy on acceptance and allocation of funds, procurement, expenditure monitoring, auditing and verification should be in place to ensure accountability. Potential impacts on the environment should be taken into consideration in implementing response. Mitigating actions should also be taken to reduce impact or risk.



Synthesis

To lay the commitments together and show the relationship of each with the others, the discussion can be synthesized by encouraging MDRRMC or the BDRRMC representatives to look at their offices and roles from an operational perspective or a business model.

MODULE 6: Simulation Exercise

Description

A Simulation Exercise (SimEx) is a fictional disaster event created to test the plans and procedures that would come into effect during a real disaster event. The purpose of the Andam Lahar SimEx is to test the Lahar Preparedness Plan crafted by the communities, from monitoring hazard triggers, community decision making, warning communication, evacuation, and demobilization. Through the SimEx, community leaders and households can deepen knowledge on lahar preparedness, strengthen skills on monitoring and warning communication, and improve community coordination.

The Andam Lahar SimEx is community-designed, with the barangay and municipality designing their action steps based on the scenarios presented during the tabletop exercise. The size and scale of the SimEx is based on the design of the community, recognizing the resources available to the actors, partners that can be tapped to participate, and the scenario of which the script is based.

Key Message

The SimEx should emphasize the following messages:

- Simulation Exercises are designed to test the plans and procedures set in place for lahar risks in the area.
- The Simulation Exercise is focused on testing the different phases of anticipatory action: monitoring, decision making, warning communication, and evacuation.
- Simulation Exercises are designed to allow participants to recognize their strengths and gaps in lahar preparedness. The gaps in planning, resources, and execution during the SimEx should inform future policies, capacity development, and resources for the barangay and municipality.
- Simulation Exercises are experiential educational tools, hence decision makers, responders, and households are encouraged to participate.

Objectives

- Guide communities and leaders in designing a Simulation Exercise on lahar preparedness;
- Organize a simulation exercise, testing the Lahar Preparedness Plan crafted by the community leaders;
- Guide organizers on how to cull lessons learned and next steps based on the evaluation of the simulation exercise.

Learning Outcomes

At the end of the session, participants have:

1. Participated in organizing a simulation exercise in their community;
2. Participated in the conduct of a simulation exercise in their community;
3. Tested the efficacy of their proposed Lahar Preparedness Plan, and;
4. Crafted recommendations for improvement and ways forward based on the SimEx assessment.

References

- Training on Disaster Preparedness and Contingency Planning vol. 4: Guide to Conducting a Community Drill (ACCORD, 2012) <http://test.accord.org.ph/wp-content/uploads/2017/09/ACCORD-manual-vol-4-Guide-to-Community-Drill.pdf>
- NDRMMC Memorandum No. 140 s. 2018 CY 2019 1st Quarter Nationwide Simultaneous Earthquake Drill <https://ched.gov.ph/region10/wp-content/uploads/sites/13/2019/01/RL-No.-009-s.2019-PARTICIPATION-IN-THE-CONDUCT-OF-1ST-QUARTER-CY-2019-NATIONWIDE-SIMULTANEOUS-EARTHQUAKE-DRILL-NSED.pdf>

Introduction

A Simulation Exercise (SimEx) is a fictional disaster event created to test the plans and procedures that would come into effect during a real disaster event. The purpose of the Andam Lahar SimEx is to test the Lahar Preparedness Plan crafted by the communities during the Municipal and Barangay Training, from a) monitoring hazard triggers, b) community decision making, c) warning communication, d) evacuation, and e) demobilization. Through the SimEx, community leaders and households can deepen knowledge on lahar preparedness, strengthen skills on monitoring and warning communication, and improve community coordination.

The Andam Lahar SimEx is community-designed, with the barangay and municipality crafting their action steps based on the scenarios presented during the tabletop exercise. The size and sale of the SimEx is based on the design of the community, recognizing the resources available to the actors, partners that can be tapped to participate, and the scenario of which the script is based on.

The Simulation Exercise usually consists of the following steps:

1. Preparations
2. Implementation
3. Evaluation

Session 1: Preparation

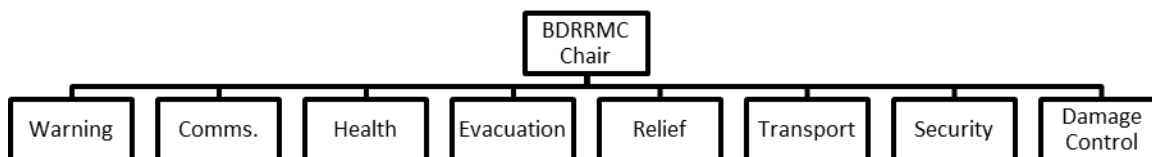
The SimEx can be scheduled 1-3 weeks after the conduct of the Lahar Preparedness Training. This is to ensure that the plans crafted during the training is still fresh for the participants, as well as to invest on the interest of the participants on lahar preparedness. Preparations should include the following:

1. Complete their Barangay Lahar Preparedness Plan

The barangay is encouraged to complete the Brgy. Lahar Preparedness Plan they've started during the Municipal and Barangay. Training. The Lahar Preparedness Plan should include what the different tasks units do during different alert levels, as well as committees who are dedicated for Lahar Preparedness.

Task Units/ Committees	Warning Level Required Actions			Person in Charge	Roles & Re- sponsibilities
	1	2	3		
Warning					
Communication					
Transportation					
Security					
Health					
Evacuation					

Sample Task Units or Barangay Committees for Lahar Risks



2. Present the Brgy. Lahar Preparedness Plan to the Council for comments, suggestions and sign-off

After completing the Preparedness Plan, it is encouraged that the Plan be presented to the Council as soon as possible. Gather comments and suggestions. Revise accordingly and gather sign-off to have this plan validated during the simulation.

In case there is no more opportunity to improve the plan due to time constraints, please

secure sign-off to use the draft plan, with review results as basis for revisions after the SimEx.

3. Review previous training on evacuation planning, camp management, ICS

The focus of the Lahar Preparedness training is to craft monitoring and warning measures appropriate for lahar risks. Previous training on evacuation planning, camp management, relief operations, emergency logistics, ICS, etc still applies to a Lahar SimEx.

4. Communicate and invite residents to participate SimEx

Please advise residents that a Simulation Exercise on Lahar Preparedness will be conducted on the assigned date. Their participation is crucial to confirm if the proposed actions are appropriate to the context of the barangay. Up to 100 barangay residents (from different puroks, ideally) can participate in the simulation. It is suggested that you also organize a barangay meeting with the participants to review the actions committed for every Alert. Residents who are not joining the exercise should also be informed as the SimEx may interrupt on their activities.

5. Prepare volunteers on what to expect, to do, to bring

Ensure that the residents who will be joining the SimEx understands the aim of the exercise, as well as the action steps they are expected to do according to each warning alert. Please also remind the volunteers on what to bring during evacuation such as go-bags, medicines, sleeping mats, food, etc.

6. Coordinate with other local stakeholders

Local stakeholders can be participants or supporters of a SimEx. You can tap BFP, PNP to provide support in safety and security; RHU to support medical services; local transport organizations as source of evacuation vehicles; local media to disseminate information about the SimEx, etc.

7. Prepare equipment, evacuation centers, etc

Local equipment that would be used during the simulation should be prepared. Equipment to be used for the SimEx can include VHF radios, megaphone, flag markers, etc. It is also encouraged that barangays also identify and prepare community spaces for the evacuation, i.e. pick-up points, evacuation centers, etc.

Session 2: Implementation

The emphasis for a Lahar SimEx is to present and evaluate how communities conduct the following phases of anticipatory action: monitoring, community decision-making, and warning communication. The SimEx must clearly present how the participants fulfill these phases based on the inserts provided in the scenario of which the SimEx is based.

The Simulation can include acting on evacuation procedure, camp management, and demobilization. Monitoring and warning communication should still run parallel to these actions during the simulation.

On average, a Simulation Exercise can run for 2-3 hours, depending on the number of inserts the barangay and municipality agreed to run, as well as the scale of the SimEx. As the SimEx is community-designed, the Andam Lahar Team is not involved in the implementation of the exercise; they remain as observers and evaluators of the whole process.

Before the start of any simulation exercise, it is important to organize a briefing to review the scenario, roles, and agreements for the all actors involved in the exercise. The pre-briefing should, at least, include the following discussions:

Introductions of Actors

A quick round of introductions must be done at the start of the briefing, highlighting the organizations, groups, and teams present at the simulation exercise. The introductions must highlight the decision makers, responders, volunteers, and community members who are taking leadership roles during the exercise. This would allow the evaluators and observers who to follow during the simulation.

Review of Scenario

Do a quick review of the scenario and inserts. Unless specifically requested, there is no need to review the planned actions of the task units and local actors. Ensure, however, that the evaluators have a copy of the lahar preparedness plans for the area.

Synchronize Timing

Agree with the actors and teams on the timing of inserts. This would allow the evaluators to have an idea how the simulation is happening. There is no need to be exact with the timing, estimates would do.

Roles of Actors

Emphasize that all decisions and actions would be done by the barangay, municipal actors and other stakeholders involved in the simulation. The Andam Lahar team will not provide guidance, instructions, or directions during the SimEx. The Andam Lahar team will solely observe and evaluate the process.

Evaluation Process

Reiterate that the purpose of the Simulation Exercise is to evaluate the appropriateness of the draft Lahar Preparedness Plan to their local context and available resources. As such, the evaluation would focus on the following: monitoring of hazards, decision-making based on monitored triggers, dissemination of actions / warning communication, activation of community towards evacuation. What will be evaluated is not just on how they move people, but how they received info, used it to make decisions, and communicated it to communities.

The briefing should not exceed 20 minutes. Ask the participants if they have additional questions that need to be addressed before the start of the simulation.

Session 3: Evaluation

Evaluation happens simultaneous and after the conduct of a SimEx. Evaluators and observers must be identified before the SimEx starts, to provide feedback to the actors and the actions taken.

The evaluation would focus on how the different task units of the barangay, as well as related local government offices, perform in monitoring risks, disseminate warning advisories, evacuate affected populations, and organize evacuees at the evacuation center. The following form can be used for evaluators to provide feedback.

Simulation Exercises Evaluation Form

Barangay, Municipality	Date and Time
Name of Evaluator	Location of Evaluator

Warning and Communication	Competently Performed		Comments and Observation
Warning and communication instrument visible / heard / properly disseminated to recipient population	Y	N	
Recipient population understand the meaning of warning and communication	Y	N	
Warning and communication is timely and provide enough lead time	Y	N	
Communication among task units are clear and well understood	Y	N	

Evacuation and Camp Management	Competently Performed		Comments and Observation
Evacuation routes posted	Y	N	
Evacuation center signs visible and clearly marked	Y	N	
Pickup points visible and clearly marked	Y	N	
Evacuation movement is timely and systematic	Y	N	
Arrival at evacuation center is well coordinated with proper designation	Y	N	
Evacuation facilities properly marked (clinic, lactating room, isolation room, toilet, etc)	Y	N	
Accessibility for PWD	Y	N	
Proper waste disposal, health and sanitation	Y	N	

Transportation and Security	Competently Performed		Comments and Observation
Organized and coordinated for timely availability	Y	N	
Security personnel in place in the community, evacuation route and evacuation center	Y	N	

Relief and Logistics	Competently Performed		Comments and Observation
Distribution of relief is organized and systematic	Y	N	
Supplies and equipment are readily available	Y	N	

It is equally important to gather feedback from the residents who participated in the SimEx. Feedback should include their reflection on their experience, and recommendations on how to improve future simulation exercises, or actual action in response to lahar risks. The organizers can organize small groups of 6 to 12 respondents for the feedbacking; the form below can be used to gather feedback.

**Simulation Exercises
Feedback from Participants**

Questions	Responses (Summary)
<p>How was your experience in receiving warning alerts related to lahar? (Was the advice clear, easy to understand, provides enough info on what to do, what to bring, where to go?)</p> <p><i>Kamusta ang karanasan ng pagtanggap ng abiso tungkol sa banta ng lahar? (ito ba ay klaro, madaling maintindihan, nagbibigay ng sapat na impormasyon kung anong maaaring gawin, dalhin?)</i></p>	
<p>How was your experience during the evacuation? (Where the instructions clear on where you are going, do you know your pick-up points? Do you know what to bring during an evacuation? Are there signs pointing where you need to go? Are the signs easy to follow? If the evacuation happens at night or in the dark, can you follow the signs, is it easy to go to your evacuation center?)</p> <p><i>Kamusta ang karanasan sa pag-evacuate? (Klaro ba ang instructions kung saan pupunta, alam ba kung saan ang pickup points? Ano ang inyong dala habang nag-evacuate, and inabiso ba ito ng barangay? May signs ba na nagtuturo kung saan pupunta? Madali bang sundan ang mga markers – sa araw na maliwanag, sa gabi na madilim?)</i></p>	
<p>In your opinion, how can your leaders improve warning advisory on lahar risks?</p> <p><i>Para sa inyo, sa papaanong paraan pa ma-improve ang pag-</i></p>	
<p>In your opinion, how can your leaders improve the evacuation process due to lahar risks?</p> <p><i>Para sa inyo, sa papaanong paraan pa ma-improve ang pag-likas dahil sa banta ng lahar?</i></p>	

At the end of the simulation, a review session must be organized to gather feedback and recommendations. Feedback from all participants – decision makers, actors, observers – must be culled in the process. It is recommended to follow this suggested process:

Harvesting Feedback from Actors

Divide the group into small groups of 4 to 8. Ensure that the group is diversified (mix of LGU actors, evaluators, observers) and has a common reference point (reviewing the same location). Give them a few minutes to answer the below matrix:

	Monitoring	Warning Communication	Action Steps	Demobilization
What went well?				
What didn't go according to plan?				
What could be improved?				

After 10 to 20 minutes, allow the small groups to report on their findings, and organize it into a single report. Allow the groups to react to the observations gathered from the session.

Harvesting Feedback from Actors

After culling feedback from the team, report to the plenary the notes from the community debriefing that happened at the evacuation center. Ensure that the feedback is anonymous, and provide context when needed. The feedback should focus on the experience of the community, and their recommendations for future simulation exercises and actions.

Creating next steps forward

Based on the gathered feedback, allow the decision makers to identify next steps forward or recommendations the barangay and municipal government can take for future simulation exercises or actual laar preparedness / response. Ensure that the recommendations are contextualized and based on the actual feedback. Align the feedback on 1) task units, or 2) warning levels, or 3) parts of warning-evacuation (monitoring, communication, action, demob). If possible, ask for the participants to identify a timeline for the recommendations to be endorsed to the decision makers, and to be implemented.

APPENDICES

ANDAM LAHAR

Anticipation Action for Lahar

Ano ang Lahar?



Ang lahar ay isang uri ng marahas at mabilis na pagdaloy ng pinaghalu-halong putik, abo, at tubig mula sa Bulkang Mayon. Maaari nitong matabunan ang mga bahay, istruktura, tanim, at iba pang madadaanan nito. Nararapat na maghanda ang mga lugar na may mataas na banta ng lahar.

Warning Level	Criteria	Kahulugan	Mga Dapat Gawin
0	Walang ulan	Normal	Ipagpatuloy ang normal na gawain
1	Ulan na umaabot ng 10-15 mm kada oras =  2 galon ng tubig per sqm kada oras	Alerto	Magbantay sa lagay ng ilog at lakas ng ulan
2	Ulan na umaabot ng 25-30 mm kada oras =  4 galon ng tubig per sqm kada oras	Handa	Maghanda para sa paglikas
3	Ulan na umaabot ng 35-40 mm kada oras =  8 galon ng tubig per sqm kada oras	Likas	Lumikas tungo sa ligtas na lugar

Emergency Hotlines

-  APSEMO - 480 3772
-  Camalig MDRMO - 0916 329 4369
-  Daraga MDRMO - 0906 335 1755
-  Sto. Domingo MDRMO - 0917 316 5063

Ang Andam Lahar ay isang consortium project na binubuo ng Christian Aid Philippines, CARE Philippines, Humanity and Inclusion, Coalition for Bicol Development, Citizens' Disaster Response Center, Simon of Cyrene Community Rehabilitation and Development Foundation, Tarabang Para sa Bicol, katuwang ang Albay Public Safety and Emergency Management Office. Ito ay sinusuportahan ng Start Network, isang network ng 42 nasyonal at internasyonal na humanitarian agencies.



IEC Material for the Barangay/Municipal Level

ANDAM LAHAR Anticipation Action for Lahar Risks

Ano Ang Lahar?



Ang lahar ay isang uri ng marahas at mabilis na pagdaloy ng pinaghalu-halong putik, abo, at tubig mula sa Bulkang Mayon. Maaari nitong matabunan ang mga bahay, istruktura, tanim, at iba pang madadaanan nito. Nararapat na maghanda ang mga lugar na may mataas na banta ng lahar.

Lahar Warning Criteria

Warning Level	Criteria	Kahulugan	Mga Dapat Gawin
0	Walang ulan	Normal	Ipagpatuloy ang normal na gawain
1	Ulan na umaabot ng 10-15 mm kada oras = 2 galon ng tubig per sqm kada oras	Alerto	Magbantay sa lagay ng ilog at lakas ng ulan
2	Ulan na umaabot ng 25-30 mm kada oras = 4 galon ng tubig per sqm kada oras	Handa	Maghanda para sa paglikas
3	Ulan na umaabot ng 35-40 mm kada oras = 8 galon ng tubig per sqm kada oras	Likas	Lumikas tungo sa ligtas na lugar

Ihanda ang Go Bag



Kapag may bantang panganib, nararapat na agad lumikas papunta sa ligtas na lugar. Mahalaga na may **GO BAG** na dadalhin ang pamilya sa *evacuation center*. Siguraduhing nakalagay ito sa lugar na hindi nababasa at madaling makuha.



First aid kit na naglalaman ng gamot sa lagnat, LBM, sugat at mga regular na iniinom ng pamilya.



Pagkain na madaling ihanda at di na kailangang iluto para sa 3–5 na araw.



Mga damit, kapote, at *sanitary supplies* na para sa 3–5 na araw.



Mga mahahalagang dokumento at papeles ng pamilya.



Tubig na malinom na para sa 3–5 na araw.



Mga mahahalagang gamit at na pangangailangan ng sanggol, matatanda, at may kapansanan.



Sleeping bag, banig, at mga kumot



Flashlight, baterya, kandila, posporo, at pito na maaaring magamit.



Pera at barya



Cellphone, powerbank, listahan ng mga importanteng taong maaaring ma-kontak



IEC Material for the household level (front)

ANDAM LAHAR

Anticipation Action
for Lahar Risks

Mga Dapat Tandaan



Makibalita sa TV, radyo, at lokal na pamahalaan para sa mga balita ukol sa lahar at iba pang mga bantang panganib.



Siguraduhing nasa ligtas na lugar ang mga importanteng bagay sa bahay at mga alagang hayop.



Ihanda ang GO BAG kung sakaling kinakailangang lumikas.



Pag-usapan sa pamilya ang mga gagawin sa paglikas. Makipag-ugnayan din sa mga kinauukulan para sa mga aksyon sa paparating na lahar.



Camalig Emergency Hotlines



APSEMO
480 3772



PNP
0947 778 0986



Office of the Mayor
0927 661 3981



OCD
481 1656



MDRRMO
0916 329 4359



BFP
0917 809 8823
284 1343



NDRRMC
481 1656
481 5031

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IEC Material for the household (back) for Camalig

ANDAM LAHAR Anticipation Action for Lahar Risks

Mga Dapat Tandaan



Makibalita sa TV, radyo, at lokal na pamahalaan para sa mga balita ukol sa lahar at iba pang mga bantang panganib.



Siguraduhing nasa ligtas na lugar ang mga importanteng bagay sa bahay at mga alagang hayop.



Ihanda ang GO BAG kung sakaling kinakailangang lumikas.



Pag-usapan sa pamilya ang mga gagawin sa paglikas. Makipag-ugnayan din sa mga kinauukulan para sa mga aksyon ukol sa paparating na lahar.



Sto. Domingo Emergency Hotlines



APSEMO
480 3772



PNP
0949 461 4167



MDRRMO
0917 316 5063



OCD
481 1656



BFP
0997 263 3388
0921 745 2459



Ambulance
0910 491 5670
0915 233 3186



NDRRMC
481 1656
481 5031

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IEC Material for the household (back) for Sto. Domingo

ANDAM LAHAR

Anticipation Action
for Lahar Risks

Mga Dapat Tandaan



Makibalita sa TV, radyo, at lokal na pamahalaan para sa mga balita ukol sa lahar at iba pang mga bantag panganib.



Siguraduhing nasa ligtas na lugar ang mga importanteng bagay sa bahay at mga alagang hayop.



Ihanda ang GO BAG kung sakaling kinakailangang lumikas.



Pag-usapan sa pamilya ang mga gagawin sa paglikas. Makipag-ugnayan din sa mga kinauukulan para sa mga aksyon ukol sa paparating na lahar.



Daraga Emergency Hotlines



APSEMO
480 3772



PNP
0949 461 4167



Office of the Mayor
0999 883 6297



OCD
481 1656



MDRRMO
0906 335 1755



Ambulance
0910 491 5670
0915 233 3186



BFP
0917 523 4130



NDRRMC
481 1656
481 5031

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IEC Material for the household (back) for Daraga

MOVING FORWARD

The disaster risk reduction program of Albay started in 1989 and the institutionalization of Albay Public Safety and Emergency Management Office (APSEMO) in 2004 was founded on the need to address the impacts of disaster from various causes that caused widespread destruction to properties and loss of lives. One of the tasks of APSEMO is to provide technical capacity and empower local government units in the delivery of humanitarian works and reduce disaster risk of vulnerable population particular the communities that are the first line of defense. The success of DRR in Albay is best exemplified by achieving “zero casualty” that was made possible by the participation of various government institutions and most importantly by the contribution and cooperation of the communities (BDRMC). The ANDAM LAHAR project is another example that underlines partnership and collaboration of local government units, non-government organizations and the community that addresses major challenge in Albay on lack of information and awareness of population at risk particularly those exposed to lahar hazard that covers 79 barangay from nine local government units (3 cities, 6 municipalities).

A major accomplishment and output of this project is the Andam Lahar Preparedness Module, a community based training tool that standardizes understanding of lahar as a hazard and provides a tool that serves as a guide to facilitate LGU’s and barangays in providing capacity to the communities affected by lahar and the re-visit their respective contingency plans on lahar. At the same time, this lahar preparedness module will not only benefit Albay but other areas that may be affected by similar hazard. The Provincial Government of Albay through APSEMO is grateful to CARE, Christian Aid, Humanity and Inclusion and their local CSO partners- Coalition for Bicol Development, Citizen Disaster Response Center, Simon of Cyrene and Tarabang sa Bicol, Inc. as well the LGUs and barangays Ilawod (Camalig), Salvacion (Daraga), and Lidong (St. Domingo) for their contribution in this project.



CEDRIC DAEP
Executive Director
Albay Public Safety and Emergency Management Office
Provincial Disaster Risk Reduction Management Office

**For more information about Andam Lahar and for a copy of the module, you may contact:
apsemo_pdrmc@yahoo.com**

