

*The Study on Comprehensive Disaster Prevention
around Mayon Volcano*

DATA BOOK

**VI : PREPARATORY AND SUPPORTING
SERVICE OF THE PILOT PROJECT**

JICA

**COMPREHENSIVE DISASTER PREVENTION
AROUND MAYON VOLCANO**

PREPARATORY AND SUPPORTING SERVICE

OF

THE PILOT PROJECT

DECEMBER 2, 1999

BSBI

FOREWORD

The Center for Research on Epidemiology of Disasters in Belgium has pointed to the Philippines as the most disaster-prone country in the world. The country is susceptible and vulnerable to all types of disasters. From 1988 to early 1999, 176 typhoons were recorded to have entered the Philippine Area of Responsibility. The total cost of damage from typhoons alone registered about 15 Billion pesos. The flash floods in Ormoc, Leyte in November 6, 1991 counted 8,000 dead. In 1998, the El Niño Phenomenon left about 1 Million families hungry in the highlands of Mindanao, due to food scarcity.

The Province of Albay, in particular, suffer from many hazards, both natural and man-made. Some of these hazards are: volcanic eruption, typhoons, earthquake, tsunamis, etc. Because of lahar deposits in the slopes of Mayon Volcano, many barangays are susceptible to flood and debris flow during heavy rainfall. The Japanese International Cooperation Agency is hoping to avert further disaster to the Area through a Comprehensive Disaster Prevention Study Around Mayon Volcano. Preparatory and supporting services of the Pilot Project was done on November 27, 1999.

This Pilot Project reflects JICA's concern for the Philippines, in general and the people of Albay, in particular, in the face of the periodic disasters that occur in the country, especially in the Province of Albay. It is hoped that this Pilot Project will serve as a practical guide for disaster managers, especially in the city and barangay levels. The art of Disaster Management lies not in hoping that disaster will not come, but on our readiness to meet the hazards that come our way.

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President and Chairman of the Board
Bicol Small Business Institute
Foundation, Inc.

ACRONYMS

BDCC	Barangay Disaster Coordinating Council
BFP	Bureau of Fire Protection
BSBI	Bicol Small Business Institute
CDCC	City Disaster Coordinating Council
CHO	City Health Office
CSWDO	City Social Welfare and Development Office
DPWH	Department of Public Works and Highways
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PDCC	Provincial Disaster Coordinating Council
PIA	Public Information Agency
PNP	Philippine National Police
ROCD	Office of Civil Defense, Region V

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JICA STUDY ON COMPREHENSIVE DISASTER PREVENTION AROUND MAYON VOLCANO

IMPLEMENTATION OF PILOT PROJECT IN FORECASTING, WARNING AND EVACUATION

I Introduction

The Japan International Cooperation Agency (JICA) is undertaking a Study on Comprehensive Disaster Prevention Around Mayon Volcano in accordance with the request made by the Government of the Philippines (GOP). The objectives of this study are as follow: (a) formulation of a Master Plan for disaster prevention; (b) feasibility study on the priority projects selected in the Master Plan; and (c) technology transfer to the staff of the GOP.

The Master Plan focused on the following plans as effective measures to disaster: (a) structural mitigation plan; (b) resettlement plan; and (c) forecasting, warning and evacuation plan. The Steering Committee and Working Group organized by the GOP to provide direction and coordinate the works of the JICA Study Team accepted the proposed Master Plan at the meeting held in August, 1999 in Manila.

One of the highlights of the study is the conduct of the Pilot a project on forecasting, warning and evacuation in a selected barangay in the Study Area. The Pilot Project's main objectives is to examine the forecasting, warning and evacuation methods proposed in the Master Plan for their effectiveness. The identified issues are to be reflected in the final forecasting, warning and evacuation plan. To undertake the Pilot Project, the following factors were considered: the hazard will be the mud and debris flow and the pilot barangay will be Barangay Mabinit in Legazpi City, an area which is most vulnerable to this type of hazard based on the assessment of the JICA Study Team.

The Pilot Project was implemented on 27 November 1999 with the assistance of the Bicol Small Business Institute Foundation, Inc. (BS B IF), a non-government organization based in Legazpi City. The following agencies played the key roles in the implementation of

the Pilot Project: the Albay Provincial Disaster Management Office (PDMO), the Legazpi City Disaster Coordinating Council (CDCC), the Barangay Disaster

Coordinating Council (BDCC), the Office of Civil Defense (OCD), the Department of

Education, Culture and Sports (DECS), the Department of Public Works and Highways (DPWH), the City Social Welfare Development Office (CS WDO), the City Health Office (CHO) and the Philippine National Red Cross (PNRC).

One of the outputs of the Pilot Project is the motion-time study that is meant to improve the forecasting, warning and evacuation methods particularly on mud and debris flow. The Pilot Project has also resulted to the preparation of the following documents that will enhance the capability of the concerned agencies and the local people on disaster preparedness: the Barangay Disaster Management Manual, the OCD Mud and Debris Flow Forecasting and Warning System and the comics on Mud and Debris Flow Disaster Response. The latter is an information material designed for easy understanding of the community residents usually affected by this type of hazard.

It is envisioned that through the implementation of the Pilot Project, an effective forecasting, warning and evacuation methods on mud and debris flow will be formulated that will help in protecting human lives from this hazard.

II SUMMARY OF OBSERVATIONS AND ASSESSMENT

2.1 OBSERVATION REGARDING PRESENT SITUATION OF FORECASTING, WARNING AND EVACUATION

FORECASTING AND WARNING

1. Weather forecasting using PAGASA facilities & forecasting equipment is reliable in terms of typhoon, and even just the probability of rainfall.
2. Flood forecasting cannot be done due to the absence of appropriate equipment to use or if available, the equipment is either under repair or non-functional.
3. The present Flood forecasting equipment of OCD is not reliable based from the past experiences, where the Provincial Disaster Management Office (PDMO) had not received any warning information prior to the time of previous floodings. However, if this can be rehabilitated, somehow, it can help forecast floods.
4. The most appropriate and effective agencies to issue warning and forecasting with regards to volcanic eruption is PHIVOLCS, while for typhoon it is PAGASA because:
 - a. They are mandated and authorized to do these functions by virtue of National Policy.
 - b. These agencies have competent personnel who are available 24 hours on a 24-hour shift basis daily, regardless of holidays and non-working days.
 - c. Staff orientation of being service-oriented personnel had been proven
5. No organization is mandated to forecast or warn on hazards from mud and debris flow. Mud and debris flow is hydraulic phenomena which can be handled by a Civil Engineer.
6. Lack of communication facilities to support transmittal of warning informations.

OBSERVATION ON EVACUATION:

- Evacuation Center using school buildings and other government facilities are available but not enough to support the vulnerable population estimated to be about 30% of the total Provincial Population.
- Evacuation procedures had been established in all municipalities including the

City of Legazpi

- Not all utilized school buildings for evacuation are safe from typhoons that carry a maximum strength of at least 250 kilometer/hour.
- Evacuation routes are established, however, these need to be formally documented for inclusion in the local evacuation plan. Some of the roads are unsafe during flooding and mud flows around Mayon Volcano.
- People's attitude towards timely evacuations need reorientation and concientization. Some do not follow evacuation warning but rather execute their own plan according to their personal judgement of the danger.
- Health and Sanitation facilities at the evacuation centers are not enough to support long-term evacuation.
- School classes are hampered by evacuation activities.
- School authorities do not have enough alternative facilities to use as temporary classrooms, except when tents are made available through donations.

2.2 ASSESSMENT OF THE PILOT PROJECT

The Pilot Project opened the eyes of the agencies involved in forecasting, warning and evacuation, and made them aware that there are still a lot that they can improve from their present practice. The Pilot Project also systematized the warning signals that come from different concerned agencies. They also found out that the telephone is the least effective warning device because bad weather can also render inoperable this equipment. It appears that VHF radios are the most effective means of communication between responding agencies in case of disaster/calamity.

The Pilot Project also strengthened the working relationships between and among concerned agencies. Roles were clarified and delineated during briefings. Responses were well-coordinated and synchronized. The cooperation and collaboration among the responding agencies vastly improved, which fact was acknowledged during the assessment.

The Barangay Captain became aware of the need to listen to early warnings, and to call for a BDCC meeting upon warning of an impending lahar and debris flow. He believed that the Pilot Project helped his constituents realize the need to know what to do in order to act systematically in case the order to evacuate is given. They also realized that the roads they expect to use as exit routes can be impassable, so a

request was made to DPWH to improve the road so that they won't be trapped in their barangay.

They also realized that the bells in the Chapel and the school were not enough to warn the residents of Puroks that have farther distances from these buildings. They had to do a house-to-house warning in order to notify all the residents. This allowed them to realize that each purok should have a bell for better warning announcement.

The exercise also showed some weaknesses in the way some workers treated the evacuees. This was pointed out and hopefully the authorities concerned should advice their workers to be more cordial and service-oriented to the victims of calamities so that they don't add to the trauma or anxiety of the unfortunate evacuees.

2.3 OPINION ON THE PROPOSED FORECASTING, WARNING. AND EVACUATION

The proposed forecasting, warning and evacuation is commendable, however, using the DPWH as also a source of official warning information which is being proposed as the venue of warning equipment, may have some difficulties. The DPWH is more structure-oriented while the other members of the Disaster Coordinating Councils are people oriented.

It must be noted that the DPWH has no personnel working during the night, holidays and non-working days. If this proposal will be adopted, then DPWH would require at least eight full time personnel to do the warning and monitoring work who should be work and service-oriented. These people will also need technical trainings for the maintenance, effective warning and forecasting system and other related jobs.

Past experiences showed the unpopularity of DPWH in servicing the needs of the evacuees. The toilets and water pumps that were constructed in the evacuation centers were criticized in the local radios. In fact, the anxiety of DECS personnel whenever evacuation is imminent is the lack of toilets and source of potable water. These are perceived to be the responsibility of this agency. There is a call for DPWH to be more pro-active in helping the victims by attending to the infrastructure needs even if there are no calamities so that when disaster strikes, the roads are passable. the evacuation centers have ready toilets and potable water, and a kitchen area is available. Because of the civil engineering technology. DPWH can be a strong partner in monitoring the mud and debris flow.

The proposed technical procedures are similar to the present practices, however, there are new systems that maybe introduced by the proposed project which the local

Disaster Coordinating Council need to adjust to. One example is the principle of teamwork where every agency has to contribute its part. The proposed project is expected to strengthen the technical capabilities of local Disaster Coordinating Councils (DCC) especially in terms of Evacuation Management System and Strategy.

III IMPLEMENTATION OF PILOT PROJECT ON FORECASTING, WARNING AND EVACUATION

3.1 BACKGROUND OF THE PILOT PROJECT

On November 27, 1999, the residents of Barangay Mabinit underwent the experience of the Pilot Project Implementation. The pilot project focused on the hazards coming from mud and debris flow along the slope of Mayon Volcano.

The purpose of the pilot project was to put into drill the emergency evacuation capability of the Barangay Disaster Coordinating Council (BDCC) and to determine how fast they can mobilize to perform their respective functions when this type of hazard strikes. From the results of this exercise, a better or improved plan for evacuation was drawn.

Why mud and Debris Flow exercises? The barangay is prone to flood and lahar and they have not yet undergone a thorough simulation exercise on this type of emergency management although they had undergone actual evacuation. Records show that from time to time, this barangay due to its geographical location, has been experiencing flood and mudflows that continuously threaten the residents.

3.2 BACKGROUND OF MABINIT

Mabinit is located at the southeastern slope of Mayon Volcano in Legazpi City. The residents in this barangay have been evacuated every time there is mudflow due to heavy rainfall and in times of actual volcanic eruption of Mayon. During the February 2, 1993 Mayon Volcano eruption, several farmers from this barangay died due to pyroclastic flow. No one was hurt though due to mudflow, however, residential houses could be affected which could be the reason for major casualties of residents once they will be caught unaware and unprepared.

3.3 OBJECTIVES OF THE PILOT PROJECT

The JICA Study Team on the Comprehensive Disaster Prevention Around Mayon Volcano in cooperation with the Bicol Small Business Institute Foundation, Inc. (BSBIFI) conceptualized Pilot Project for implementation in Barangay Mabinit, Legazpi City. The Pilot Project was undertaken to test the forecasting and warning system of the OCD on mud and debris flow. It was also meant to guide the participants on Mud and Debris Flow Evacuation Strategy that they might confront at the slope of Mayon Volcano due to the barangay's geographical location.

The participants were informed of very general objectives and scenario for them to be focused on Mud and Debris Flow Evacuation Strategy. Another purpose of the Pilot Project was also to put into drill the capability of the City Disaster Coordinating Council (CDCC) and Barangay Disaster Coordinating Council (BDCC) concerned in responding to emergency evacuation using their existing local resources in terms of manpower, support equipment and time management.

An evaluation and debriefing among the participating agencies, the barangay officials and the JICA Study Team was conducted right after the activity. An additional assessment was done five days after the simulation exercise.

3.4 ORGANIZING THE SIMULATION PILOT PROJECT

The Pilot Project was planned as part of the JICA Study around Mayon Volcano. The duration of the Pilot Project including the debriefing was set for one (1) day. The JICA study team through the BSBI team helped facilitate the activity.

3.5 PARTICIPANTS TO THE PILOT PROJECT

- Members of the CDCC-Legazpi, approximately 30 persons including the medical and dental team.
- Members of the BDCC and residents of Barangay Mabinit, approximately 507 persons.
- Support staffs from the Provincial Disaster Coordinating Council (PDCC), Philippine Atmospheric Geophysical Astronomical Services Administration (PAGASA), Philippine National Red Cross (PNRC), JICA Study Team and BSBI Foundation, Inc.
- Media
- VIPs invited by CDCC, JICA and BSBI, 10 persons.
- Invited observers from selected agencies and other local government units.

3.6 ROLES AND RESPONSIBILITIES

Before the simulation drill, the BSBI team prepared the evacuation requirements with the help of concerned government and non-government personnel. Roles and responsibilities were defined. A number of meetings and informal discussions were held with the experts on disaster response and relief operations. The number of personnel chosen to join the simulation exercise were:

1. Script (Scenario) - a. Roles and Responsibilities - provided by JICA, BSBI, PDCC, CDCC and BDCC
 - b. Time Management
 - c. Equipments Needed

2. Exercise Execution Team (wearing CDCC vest)
 - CDCC - Roleo Battung/Col. Robinson Ortega
 - BDCC - Brgy. Captain Daniel Nuñez
 - Relief Team - Mrs. Marlene Manaya and the CSWDO
 - Security Team - Col. Augusto Marquez
 - Warning Team - OCD/PHIVOLCS/PDCC/PAGASA
 - Communication Team - Cedric Daep
 - Medical/Dental Team - Dr. Modesto Kapuno/Dr. Ma. Criselda Paulino
 - Information and Media - Darlito Perez, Jr.
 - Evacuation Camp Team - Mrs. Nerrisa Cantuba
 - Transportation Team - Engr. Joey Nuñez

3. Exercise Directing Team
 - a. CDCC Command Post Communication and Warning - Cedric Daep, Col. Robinson Ortega, Mr. Roleo Battung, Mr. Rey Afionuevo, Engr. Joey Nuñez and some PNP Officials
 - b. Relief. Medical and Evacuation Camp - Dr. Ofelia S. Vega and the BSBIF Staff
 - c. Security and Info/Medial Transportation - BDCC

Other requirements:

- Color-coded ID
- Index Card
- Relief Distribution Card (Optional)
- Transpo (2 vehicles): private jeepney
- Evacuation Centers (school bldg./classrooms)
- Meals for evacuees and actors
- Others (medical, dental, eye and other services)

Other tasks:

- Site visits
- Barangay
- Evacuation Center

- VHF Radio Set
- Certificate of Participation

Evacuation Center : Gogon Elementary School

Release : City truck

Manual : Barangay - Barangay Disaster Management Manual (Evacuation)
ROCD - Emergency Response Manual
DPWH - Emergency Response Manual

Observation and Analysis

Motion-Time Study : Forecasting, warning, evacuation, inspection and emergency response

Analysis : Assessment of the proposed forecasting system, warning system, evacuation procedure, accommodation of evacuation center, the procedure of the organization of Disaster Mitigation Team, the procedure to inspect site, the procedure to implement the emergency response and manuals.

3.7 Time Table of the Scenario

ACTIVITY	EXPECTED OUT PUT	TIME	OPR
WARNING LEVEL 1			
Situation :The Buyuan and Mabinit rainfall gauging stations detect a heavy rainfall			
a) Issuance of information on the possibility of heavy rainfall in the area	-PDCC activated	5 minutes	PAGASA
b)Issuance of 1st warning level to CDCC and PDCC	-CDCC and BDCC activated	5 minutes	ROCD
c) Dissemination of the warning to BDCC through VHF radio.	-BDCC on stand-by	5 minutes	CDCC
d) Close monitoring of the rainfall fluctuations	-Issuance of appropriate notice determined	60 minutes	ROCD and DPWH

ACTIVITY	EXPECTED OUTPUT	TIME	OPR
WARNING LEVEL 2			
Situation: Monitoring systems both at the ROCD and the DPWH Region V detect that rainfall reached the critical level			
a) Issuance of 2nd warning level to CDCC and PDCC	-Notice for preparation to evacuate transmitted	5 minutes	ROCD
b) Dissemination of warning to BDCC	-Required manpower and logistics mobilized to disseminate notice to residents	5 minutes	CDCC
c) Dissemination of the warning to the people by siren blast or church bells radio announcement	-Residents informed of the preparation to evacuate	5 minutes	BDCC PIA
c) Preparation of evacuation kits	-Residents prepared to go to the designated pick-up points	15 minutes	Residents
d) Preparation of evacuation center to receive evacuees	-Required manpower. to rooms and facilities in place	60 minutes	Gogon Elementary School
e) Sending of warning to the District Engineer	-Disaster Mitigation Team activated to undertake repairs	5 minutes	DPWH
f) Investigation of the Pawa-Burabod river at strategic points	-Need for any type of emergency maintenance determined	60 minutes	DPWH
g) Planning of the emergency maintenance of the channel	-Damage control plan formulated	30 minutes	DPWH

ACTIVITY	EXPECTED OUTPUT	TIME	OPR
WARNING LEVEL 3			
Situation: Residents will have to be evacuated to Gogon Elementary School			
a) Issuance of the 3rd and final warning to CDCC and PDCC	-Notice for immediate evacuation transmitted	5 minutes	ROCD
b) Dissemination of the final warning to BDCC	-Required manpower and logistics mobilized to disseminate notice to residents	5 minutes	CDCC
c) Dissemination of the notice to evacuate to the residents through siren blast or church bells and radio announcement	-Residents prepared to go to the pick-up points	5 minutes	BDCC PIA
d) Movement from residences to pick-up points	-Residents informed of assigned vehicles	15 minutes	Residents. BDCC
e) Mobilization of manpower and vehicles	-Required number of manpower and vehicles dispatched to pick-up points	15 minutes	CDCC
f) Organization of medical teams in Barangay Mabinit and in the evacuation center	-Required medical personnel and medical supplies dispatched to the barangay for first aid and emergency treatment on site and at the evacuation center	60 minutes	CHO
g) Transport of evacuees to Gogon Elementary School	-All evacuees brought to the evacuation center according to the prioritization	50 minutes	CDCC. BDCC
h) Barangay Mabinit secured	-Security in the area maintained	180 minutes	PNP, BDCC

ACTIVITY	EXPECTED OUTPUT	TIME	OPR
i) Designation of the evacuees to respective rooms	-All evacuees were registered and given room assignments at the evacuation center	120 minutes	DECS, CSWDO
j) Conduct of session with the evacuees	-Evacuees provided information on disaster management	60 minutes	CSWDO
k) Preparation and distribution of the food to the evacuees	-Evacuees given their meals at the evacuation center		CSWDO, BSBI
l) Provision of water supply at the evacuation center	-Adequate water supply assured	60 minutes	BFP
m) Maintenance of peace and order at the evacuation center	-Evacuation center secured	240 minutes	PNP
n) Dispatch of the emergency response team to the site	-Damage control plan implemented	40 minutes	DPWH
o) Transport of the medical team from Barangay Mabinit to the city	-Medical team return to normal duty	50 minutes	CHO

NORMAL ACTIVITY			
Situation The rainfall subsides			
a) Issuance of notice to CDCC and PDCC that the danger is over	- Notice to return to the barangay recommended	5 minutes	ROCD
b) Announcement to the BDCC that the situation is back to normal and the evacuees can return home.	- Notice to return to the barangay is issued	5 minutes	CDCC
c) Dissemination of the information to return to the barangay to the residents	- Residents prepared to go home	5 minutes	BDCC, PIA
d) Mobilization of manpower and transportation facilities	-Total number of manpower and vehicles dispatched	15 minutes	CDCC
e) Movement from the evacuation center to the vehicles	- Residents get into the assigned vehicle	15 minutes	CDCC, BDCC, Residents
f) Transport of residents to Barangay Mabinit	-All residents assisted in their return to the barangay	50 minutes	CDCC, BDCC
g) Transport of the medical team at the evacuation center back to the CHO	-Medical team resumed normal duty	10 minutes	CHO
h) Preparation of report on the emergency response	-Improvement plan recommended	15 minutes	DPWH

IV HIGHLIGHTS OF THE 1st WORKSHOP

The 1st Workshop was held on November 24, 1999, at the Brgy. Chapel in Barangay Mabinit, Legazpi City, with a view to inform the people in Barangay Mabinit about the mechanism of mud and debris disaster, and the evacuation system proposed in the JICA Master Plan. There were 126 Philippine participants from the following organizations:

- Government Agencies (7 Gas with 1 9 participants)
- Local Government Units (1 LGU with 1 00 participants)
- Non-Government Organizations (2 NGOs with 7 participants)

The major activities in this workshop included:

- The Presentation of Barangay Disaster Preparedness Plan
- The Presentation of Highlights of the Pilot Project
- The Identification of Roles and Responsibilities

V HIGHLIGHTS OF THE 2nd WORKSHOP

The 2nd workshop was held on December 2, 1999 at the Conference Hall of Bicol Small Business Institute Foundation, inc., Legazpi City, subsequent to the implementation of the Pilot Project on November 27, 1999. This workshop was intended to assess the results of the implemented Pilot Project and upgrade the disaster coping capacity of the community and its people. There were 15 Philippine participants from the following organizations:

- Government Agencies (7 Gas with 7 participants)
- Local Government Units (1 LGU with 4 participants)
- Non-Government Organizations (2 NGOs with 3 participants)

The main issues discussed were:

- Time and Motion and Study
- Community Experiences
- Problems and Constraints
- Suggestions and Recommendations