

PHILIPPINE REPORT ON DISASTER REDUCTION

August 2004



NATIONAL DISASTER COORDINATING COUNCIL

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AFP	Armed Forces of the Philippines
ATO	Air Transport Office
BDCC	Barangay Disaster Coordinating Council
BSP	Boy Scouts of the Philippines
BSWM	Bureau of Soils and Water Management
CBDM	Community-Based Disaster Management
CBDO-DR	Citizenry-Based and Development-Oriented Disaster Response
CDCC	City Disaster Coordinating Council
CLUP	Comprehensive Land Use Plans
CNDR	Concrete Network for Disaster Response
CSD	Climate Studies Division
DCC	Disaster Coordinating Council
DCG	Disaster Control Groups
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DND	Department of National Defense
DOF	Department of Finance
DOH	Department of Health
DOJ	Department of Justice
DOTC	Department of Transportation and Communication
DPWH	Department of Public Works and Highways
DROMIC	Disaster Response Operations Monitoring and Information Center
DSWD	Department of Social Works and Development
DTI	Department of Trade and Industry
ECC	Environmental Compliance Certificate
EGGAR	Engineering Geological and Geohazard Assessment Report
EIS	Environmental Impact Statement
EMB	Environmental Management Bureau
EMS	Emergency Medical Service
EO	Executive Order
ERA	Environmental Risk Assessment
FMB	Forest Management Bureau
GDP	Gross Domestic Product
GHG	Green House Gas
GSP	Girl Scouts of the Philippines
HLURB	Housing and Land Regulatory Board
ICDPP	Integrated Community Disaster Planning Programme
IFRC	International Federation of Red Cross and Red Crescent Societies
ISDR	International Strategy for Disaster Reduction
JICA	Japan International Cooperation Agency
LCF	Local Calamity Fund
LDCC	Local Disaster Coordinating Council
LGU	Local Government Unit

LTFRB	Land Transportation Franchising and Regulatory Board
LTO	Land Transportation Office
MDCC	Municipal Disaster Coordinating Council
MDG	Millenium Development Goals
MGB	Mines and Geosciences Bureau
MIAA	Manila International Airport Authority
MMDA	Metro Manila Development Authority
MMEIRS	Metro Manila Earthquake Impact Reduction
NAIA	Ninoy Aquino International Airport
NCDPP	National Calamities and Disaster Preparedness Plan
NCF	National Calamity Fund
NDCC	National Disaster Coordinating Council
NDMC	National Disaster Management Center
NEDA	National Economic and Development Authority
NGA	National Government Agency
NGO	Non-Government Organization
NHA	National Housing Authority
NIPAS	National Integrated Protected Area System
NPFP	National Physical Framework Plan
NRRSC	National Relief and Rehabilitation Services Committee
NSCP	National Structural Code of the Philippines
NTC	National Telecommunications Commission
NWRB	National Water Resource Board
OCD	Office of Civil Defense
ODA	Official Development Assistance
PAGASA	Philippine Atmospheric Geophysical and Astronomical Services Administration
PBOAP	Private Bus Owners Association of the Philippines
PCIC	Philippine Crop Insurance Corporation
PD	Presidential Decree
PDCC	Provincial Disaster Coordinating Council
PHIVOLCS	Philippine Institute of Volcanology and Seismology
PIA	Philippine Information Agency
PMP	Prevention, Mitigation, and Preparedness
PNRC	Philippine National Red Cross
PNRI	Philippine Nuclear Research Institute
PO	Peoples Organization
QRF	Quick Response Fund
RDC	Regional Development Council
RDCC	Regional Disaster Coordinating Council
RPFP	Regional Physical Framework Plan
SAR	Search and Rescue
TELOF	Telecommunication Office
TWG	Technical Working Group

ABBREVIATIONS USED IN THE REPORT

v

Philippine Report on Disaster Reduction

UN	United Nations
UNDMT	United Nations Disaster Management Team
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commissioner for Refugees
UNISDR	United Nations International Strategy for Disaster Reduction
UP-NHRC	National Hydraulic Research Center, University of the Philippines
VCA	Vulnerability and Capacity Assessment

Prologue

This country report on achievements and progress made following the UN International Strategy for Disaster Reduction (ISDR) is the collective effort of national government agencies, local government offices, non-government organizations, business groups, professional groups, and academic institutions involved in disaster risk management. The consultations were made under the auspices of the National Disaster Coordinating Council (NDCC), the high-level coordinator of disaster management activities in the Philippines.

1 Political Commitment and Institutional Aspects

1.1 National policy, strategy, and legislation that addresses disaster risk reduction

Presidential Decree No. (PD) 1566 which was promulgated on 11 June 1978 is the overarching law on disaster management in the Philippines. It established the following state policies:

- Self-reliance through self-help and mutual assistance among the local officials and their constituents
- Each political and administrative subdivision to utilize all available resources before asking for assistance from neighboring entities or higher authority
- The primary responsibility for disaster management rests on the government agencies in the affected areas in coordination with the people
- Government departments, bureaus, and agencies must have documented plans of emergency functions and activities
- Planning and operation shall be done at the barangay (community) level in an inter-agency, multi-sectoral basis
- The responsibility for leadership rests on the Provincial Governor, City/Municipal Mayor, and Barangay Chairman each according to his area of responsibility
- When an emergency affects several towns and cities, the Provincial Governor assumes operational control and
- Conduct of periodic exercises at all levels, principally in barangays.

The Decree is supported by other laws on local government, disaster preparedness, disaster mitigation, disaster response, and rehabilitation (*Figure 1*).

P.D. 1566

State Policy on Disaster Management

Organization for Disaster Management

R.A. 7160 Local Government Code of 1991

NCDPP and Implementing Plans

Preparedness

Proclamation No. 296 of 1988

E.O. 137 of 1999

Mitigation

R.A. 6541 National Building Code

P.D. 1185 Fire Code

LOI 1350 and E.O. 72 Land Use and Physical Planning

P.D. 984 Pollution Control Law

P.D. 1586 Environmental Impact Statement System

DENR AO 37 of 1996

DENR AO 28 of 2000 EGGAR

R.A. 6969 Toxic Substances and Hazardous Unclear Wastes

R.A. 8749 Clean Air Act of 1999

R.A. 9003 Ecological Solid Waste Management Act

Response

Rehabilitation

R.A. 7160 and R.A. 8185 for Local Calamity Fund

Annual General Appropriation Act for National Calamity Fund



To guide the disaster management activities, the 1988 National Calamities and Disaster Preparedness Plan is in place.

Preparedness

Preparedness activities include community organizing, training, planning, equipping, stockpiling, hazard mapping, and public information and education initiatives.

NGOs are at the forefront of advocating and implementing community-based disaster management (CBDM) programs in the country. One national government agency has engaged the local government and community in hazard mapping and preparing for emergencies. CBDM comprises all enumerated preparedness activities. These programs target and build up the disaster management capabilities of the communities, the local governments, and other local NGOs. Obviously, the programs' reach is limited by the availability of funds.

The national government, through the Office of Civil Defense (OCD), is the leading trainer of local government executives, deputized auxiliaries, volunteers, organic personnel, etc. The training modules include contingency planning, emergency management training, and specialized training on basic life support, collapsed structure search and rescue, disaster quick response, medical first response, and emergency medical technician's basic course. The UNHCR assisted the OCD with the publication of the manual on contingency planning for emergencies in 2003.

Disaster awareness is part of the learning core competencies under Science in public elementary and high schools. The same needs to be done for private schools.

Two laws enhance disaster awareness. One is Proclamation No. 296 of 1988 which declares the first week of July every year as Natural Disaster Consciousness Week; the other is Executive Order No. 137 of 1999 which declares the month of July every year as National Disaster Consciousness Month. The Order allows the implementation by national and local government agencies and the public of their disaster awareness campaign comprehensively with longer focus and well-coordinated fashion.

Hazards mapping for earthquakes, volcanoes, floods, drought, landslides, and other geohazards is undertaken primarily by national government agencies. Because of budget constraints, the country lacks semi-detailed and detailed hazard and multi-hazard maps. International donor agencies supplement locally available funds and expertise for hazards mapping. Two recent examples of foreign assistance are the JICA-funded Metro Manila Earthquake Impact Reduction Study (MMEIRS) and the UNDP-funded Pilot Geohazards Project. The latter project's target areas are the highly urbanized, densely populated, and rapidly developing areas at risk from geohazards.

The country's environmental impact statement (EIS) system requires proponents of environmentally critical or sensitive development projects to subject said projects to an environmental risk assessment (ERA) and an engineering geological and geohazard assessment (EGGA). The ERA, formalized in 1996, analyzes and describes the risks associated with the project to ecosystems and human health and welfare. One component of the ERA is an emergency or contingency plan that takes into consideration the worst possible consequences. The EGGA, which was required in 2000, assesses the geologic setting as well as the geologic, hydrologic, and other natural hazards which may affect the project. Conclusions and recommendations on how such hazards may be managed or mitigated by the project design are formulated.

One academic institution assists the national government in the assessment and mapping of hydrometeorological hazards. The NGOs which implement CBDM also undertake hazards mapping, primarily for floods.

Mitigation

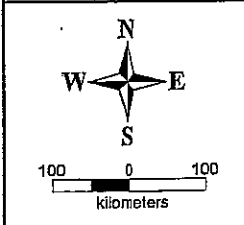
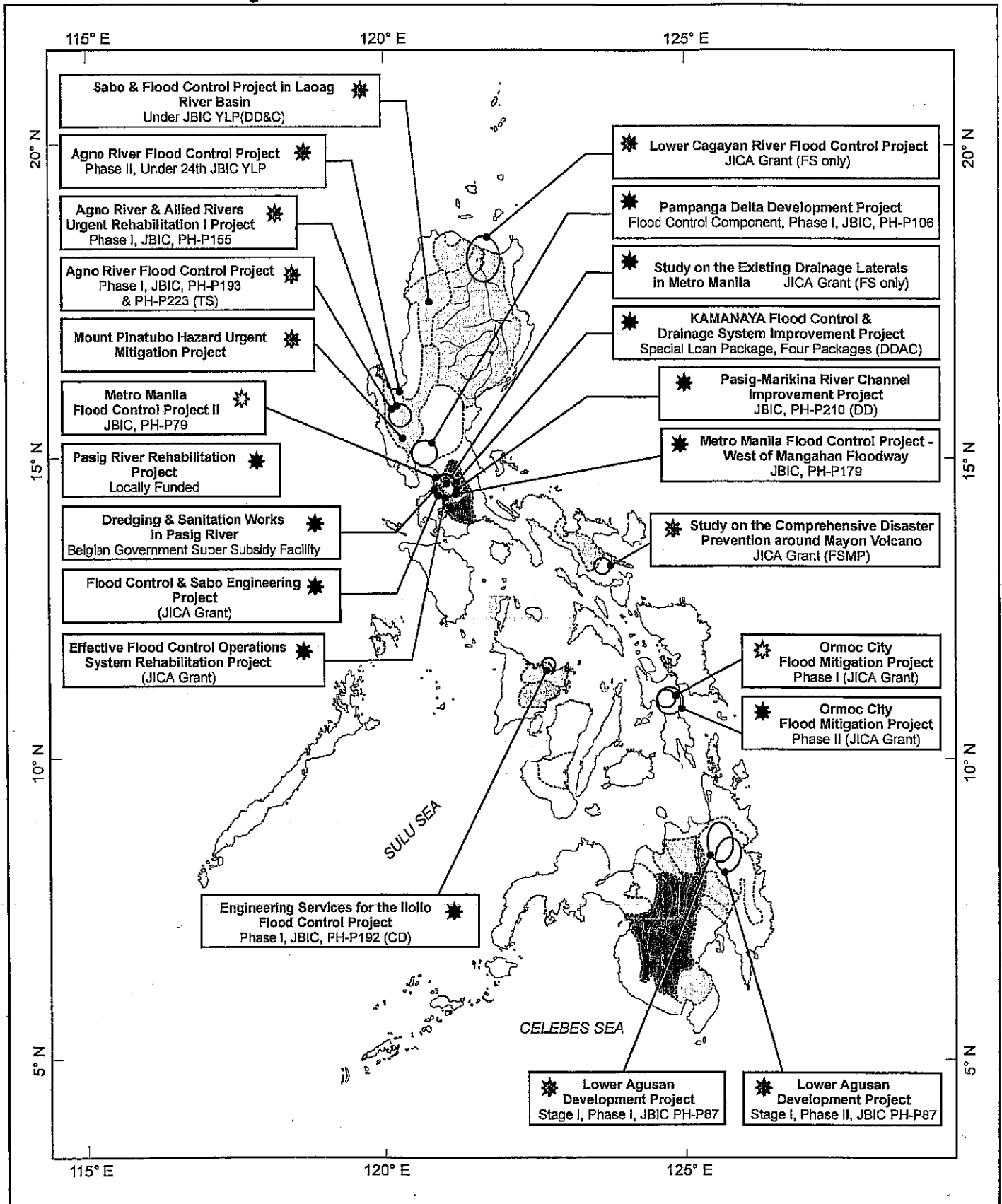
Mitigation covers physical or structural mitigation works, land use planning, and building codes.

The Philippine Medium-Term Development Plan for 2001 to 2004 provides for structural measures against flood in both urban and rural areas. The programmed structural measures for the rural areas include dikes, levees, cut-off channels, diversion floodways, training levees, and bank protection. In urban areas, the structural measures are river wall revetment, drainage mains and pumping stations, operations and maintenance, and rehabilitation and improvement of existing facilities. Structural measures have been put up in the Agno, Cagayan, Pampanga, Bicol, and Agusan River basins as well as in Metro Manila and Ormoc City. A total of 1.94 million hectares have been identified for flood control projects. By end-of-2004, 1.7 million hectares or 87.57 % is projected for completion (*Figure 2*).

Cities and municipalities are required to come up with comprehensive land use plans (CLUPs). Based on the country's National Physical Framework Plan (NPFPP), the plans should be consistent with, among others, the reduction of vulnerability to natural and man-made disasters.

In 2000, only 15.5 % of the 1,524 municipalities and 84 cities have CLUPs. In view of this, several measures are programmed in the Medium-Term Development Plan. These are technical assistance for the local governments in the preparation of the CLUPs, enhanced mechanisms for the participation of the local civil society and private sector in programs on housing and urban development, and creation of local housing boards to develop, implement, and monitor policies on the provision of houses and resettlement areas and the upholding of the rights of the underprivileged and homeless to a just and humane resettlement program.

The country's building code provides a framework of minimum standards and requirements for all buildings and structures. The code operates through a



Map Projection:
Latitude - Longitude

Source:
DPWH

- EXPLANATION:**
- Projects under PMO-MFCP Cluster I
 - Projects under PMO-MFCP Cluster II
 - Completed Projects

- LEGEND:**
- Drainage Boundary
 - Completed Projects
 - On-going Projects
 - Projects not yet started
 - Proposed Project

- FS Feasibility Study
- MP Master Plan
- DD Detailed Design
- C Construction
- TS Tendering Stage
- LF Locally Funded

Building Permit which is required prior to the construction, alteration, or demolition of any structure. An updating of the code is necessary in view of modern technology, new construction products and materials, and recent findings in natural and man-made hazards and behavior of materials under these stresses.

Response

Response refers to the concerted effort by two or more agencies, public or private, to provide emergency assistance or relief to disaster victims and to restore essential public activities and facilities. Emergency requirements are initially provided by the local disaster coordinating council (LDCC) using their calamity fund and other resources. This requires the mobilization of the local services on warning, rescue, evacuation, disaster relief, medical, fire brigade, and damage control. Support from higher disaster coordinating councils comes in after the local council's resources are depleted. NDCC's action takes the form of calamity area declaration, calamity fund release, and additional resource deployment.

NGOs, private business groups, and international donor agencies provide humanitarian assistance during emergencies.

The country's disaster response system is weak in at least three areas, namely:

- Limited capacity of various government search and rescue (SAR) teams to respond to emergency situations like water SAR, aerial SAR, urban SAR, fire SAR, etc.
- Lack or absence of permanent emergency medical service (EMS) practitioners in the provincial, city, and municipal levels.
- Inadequate equipment of EMS teams nationwide like properly equipped ambulances and life-saving devices.

Rehabilitation

Rehabilitation is the process through which the affected communities, areas or public infrastructures are restored to their normal level or actual condition prior to the occurrence of the disaster. One good example is the management by a private business group of three permanent resettlement sites for 750 households affected by Pinatubo Volcano. The house and lot amortization and income of the households are used to fund community-based activities such as maintenance of water and power facilities, drainage system, road network, land titling, and capability building.

The government has very limited funds for rehabilitation. One application is the post-disaster seed distribution program.

1.2 National body for multi-sectoral coordination and collaboration in disaster risk reduction

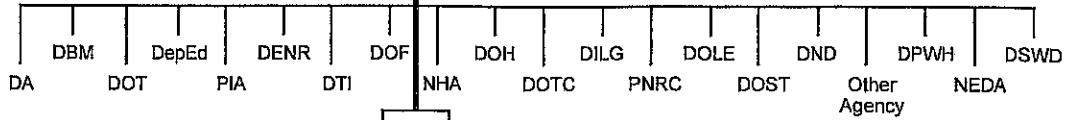
The NDCC acts as the high-level coordinator of disaster management activities and the allocator of resources to support the LDCCs. With the Secretary of National Defense as Chairman, the Council includes almost all Department Secretaries as members. The NDCC utilizes the facilities and services of the OCD as its operating arm and Secretariat. *Figure 3* shows the organization and inter-relationship of the various DCCs and *Table 1* lists the NDCC member agencies and their corresponding functions.

Table 1. Member departments and agencies of the NDCC

NDCC-Member Agency	NDCC Functions
Department of Agriculture	<ul style="list-style-type: none"> • Organizes reaction teams in the Department proper and member offices and bureaus • Coordinates with the Philippine Crop Insurance Corporation (PCIC) for the immediate release to farmers of their crop insurance to compensate losses suffered • Maintains data on agricultural crops, livestock and fisheries in disaster-prone areas to facilitate the assessment of damages during calamity and furnishes these data to the NDCC through the OCD • Undertakes surveys in disaster areas to determine the extent of damage on agricultural crops, livestock, and fisheries and renders reports to the NDCC through the OCD • Renders technical assistance to disaster victims whose crops or livestock have been destroyed, damaged or lost.
Department of Budget and Management	<ul style="list-style-type: none"> • Organizes reaction teams in the Department proper and member offices and bureaus • Releases the necessary funds to implementing agencies as recommended by NDCC and approved by the President • Issues rules and regulations on the inclusion of disaster preparedness activities in the preparation of the Annual Investment Plan of local government units (LGUs).
Department of Education	<ul style="list-style-type: none"> • Organizes reaction teams in the Department proper and member offices and bureaus, including the Boy Scouts of the Philippines (BSP), Girl Scouts of the Philippines (GSP), and other institutions of learning • Makes available school buildings nearest the affected areas as evacuation centers • Assists in the public education campaign through the integration in the school curricula of subjects relative to the different calamities, their causes and precautionary measures • Undertakes, compiles and provides a report of

NATIONAL DISASTER COORDINATING COUNCIL

CHAIRMAN
Secretary of DND



OCD CENTRAL OFFICE

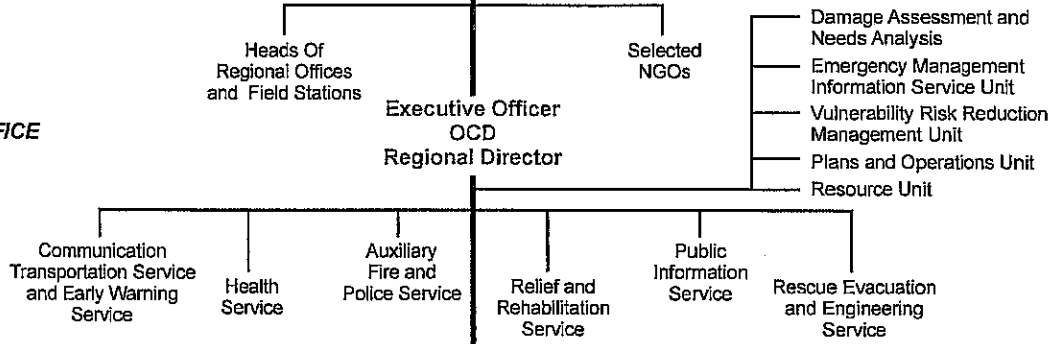
OCD

REGIONAL DISASTER COORDINATING COUNCIL

CHAIRMAN
PNP Regional Director

OCD REGIONAL OFFICE

Executive Officer
OCD
Regional Director

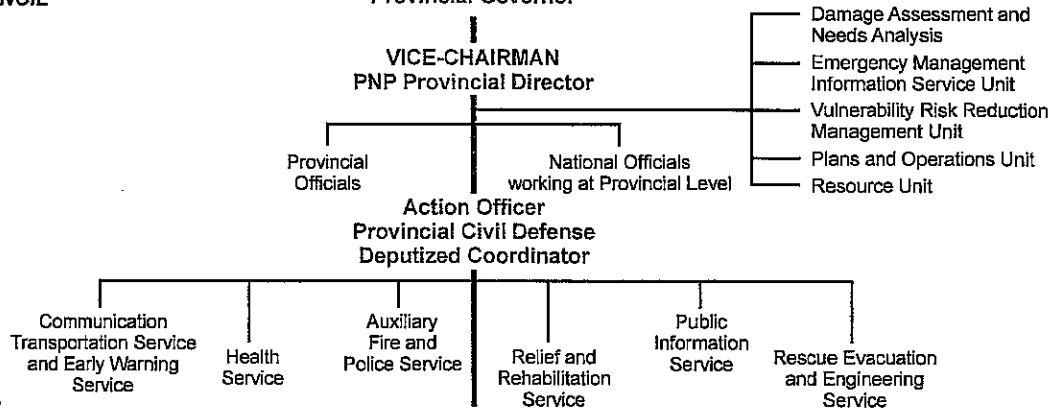


PROVINCIAL DISASTER COORDINATING COUNCIL

CHAIRMAN
Provincial Governor

VICE-CHAIRMAN
PNP Provincial Director

Action Officer
Provincial Civil Defense
Deputized Coordinator

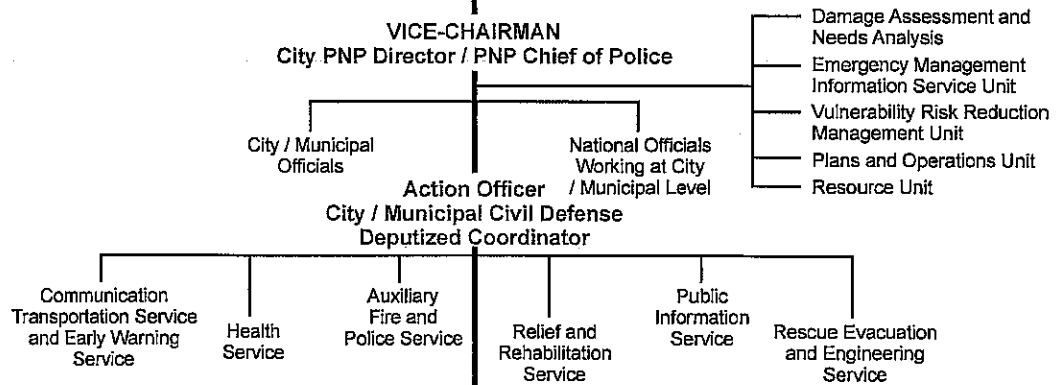


CITY / MUNICIPAL DISASTER COORDINATING COUNCIL

CHAIRMAN
City / Municipal Mayor

VICE-CHAIRMAN
City PNP Director / PNP Chief of Police

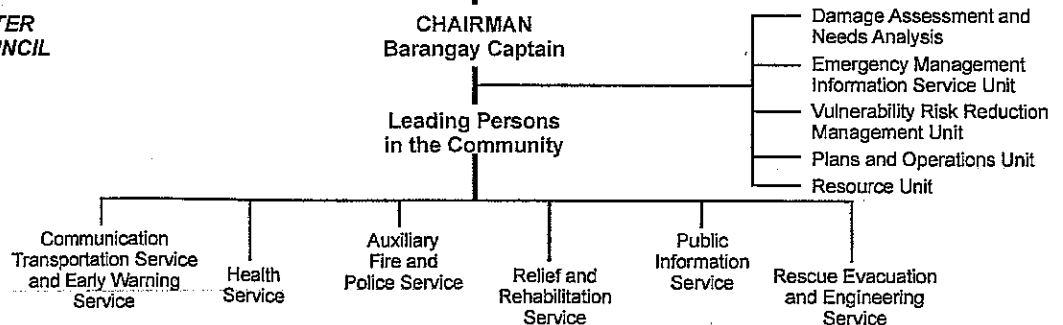
Action Officer
City / Municipal Civil Defense
Deputized Coordinator



BARANGAY DISASTER COORDINATING COUNCIL

CHAIRMAN
Barangay Captain

Leading Persons
in the Community



NDCC-Member Agency	NDCC Functions
	<p>damages of schools affected by disasters and submits the same to the NDCC Chairman</p> <ul style="list-style-type: none"> • Disseminates weather information to the general public through the school population and makes the announcements on the suspension of classes • Initiates the preparation and production of curricular materials on disaster preparedness in coordination with the other member-agencies and makes them available to schools.
<p>Department of Environment and Natural Resources</p>	<ul style="list-style-type: none"> • Organizes, mobilizes, and trains reaction teams or task forces in the Department proper and member bureaus including regional, provincial, and community officers for disaster control management • Reforests and establishes control measures in areas prone to flooding, landslide, mudflows, and ground subsidence • Provides technical assistance on geohazard mapping and assessment studies of major urban centers and critical areas in order to minimize disasters • Undertakes necessary measures to prevent accidents caused by typhoon-vulnerable trees in urban areas • Promulgates rules and regulations for the control of forest fires and forest pest and diseases • Conducts a continuing geohazard assessment of the Philippines.
<p>Department of Finance</p>	<ul style="list-style-type: none"> • Organizes reaction teams in the Department proper and member offices and bureaus • Issues and promulgates customs rules and regulations pertaining to the entry and release of goods from donor countries • Issues rules and regulations jointly with the DBM on the preparation of local government budget and the utilization of the 5 % reserve for disaster operations • Coordinates with the Central Bank on the provision of special rediscounting privileges to financial institutions that will extend financial assistance to disaster-stricken families.
<p>Department of Health</p>	<ul style="list-style-type: none"> • Organizes the health sector for more responsive and integrated health response to disasters and emergencies • Assists the LGUs during emergencies through direct assistance or technical expertise on sanitation, public health concerns and other health hazards • Undertakes necessary measures together with LGUs to prevent the occurrence of communicable diseases and epidemics

NDCC-Member Agency	NDCC Functions
	<ul style="list-style-type: none"> • Develops policies and protocols on the health response to disasters and skills training • Issues warnings and advisories to the public on epidemics and other health hazards • Maintains data on health status including vulnerable populations to facilitate assessment of health needs and furnish these data to the NDCC • Organizes assessment teams and medical response teams in the regional health offices and DOH hospitals to assist the LGUs during emergencies.
<p>Department of Interior and Local Government</p>	<ul style="list-style-type: none"> • Oversees the organization/activation of the LDCCs in coordination with the OCD • Assists the LGUs organize Disaster Control Groups (DCGs) and conduct training programs for DCGs, DCCs, and Civil Defense Deputized Coordinators • Assists the LGUs in coordination with the DSWD in the establishment of evacuation sites and actual evacuation of disaster victims • Formulates policy reforms to ensure the effective delivery of basic services during emergencies • Oversees the organization/activation of Local Price Monitoring Teams in coordination with DTI to ensure stable prices of basic commodities during emergencies • Ensures public safety and promotes public peace and order at all times • Organizes Police Auxiliary Services and Auxiliary Fire Services in the LGUs.
<p>Department of Labor and Employment</p>	<ul style="list-style-type: none"> • Organizes reaction teams in the Department proper and member offices and bureaus • Organizes DCGs and reaction teams in factories and industrial complexes with the assistance of the DND and DPWH • Provides emergency employment to disaster victims and in coordination with the DND through the OCD, implements Industrial Civil Defense Programs and Measures.

NDCC Member Agency	NDCC Functions
<p>Department of National Defense</p>	<p>Armed Forces of the Philippines:</p> <ul style="list-style-type: none"> • Organizes reaction teams in all military installations • Establishes communication linkages and makes these available for disaster operations • Assists the PNP in providing security coverage in disaster areas • Assists in the reconstruction of damaged national and local roads, bridges, structures, or facilities • Assists in providing transportation facilities for the rapid movement of relief supplies and personnel and evacuation of disaster victims.
	<p>Office of Civil Defense:</p> <ul style="list-style-type: none"> • Makes available the National Disaster Management Center (NDMC) for use by the Council during disaster operations and conferences of the NDCC TWG • Spearheads, in coordination with the DILG, the organization of DCCs and, with other agencies, the organization of DCGs or Action Teams • Develops programs of instruction/training modules for disaster preparedness training of DCCs and DCGs in coordination with the DSWD and DILG • Develops training programs and trains the organic trainers of the departments/agencies tasked with the organization of DCCs, DCGs, or reaction teams • Conducts studies on disaster management • Receives bulletins from warning agencies and disseminates the same to the appropriate agencies and general public • Monitors the implementation of the various provisions of PD 1566.
	<p>Department Proper:</p> <ul style="list-style-type: none"> • Organizes DCGs and teams in the department proper and member bureaus, offices, or agencies • Provides budget for activities to be undertaken by the NDCC TWG.
<p>Department of Public Works and Highways</p>	<ul style="list-style-type: none"> • Organizes reaction teams in the department proper and member offices and bureaus • Prepares and identifies buildings, facilities, and infrastructures for use as evacuation shelter during emergencies • Provides warning to the public on impending water release from dams within its control

NDCC-Member Agency	NDCC Functions
	<ul style="list-style-type: none"> • Assists in providing transportation facilities for relief supplies, personnel, and disaster victims • Makes available communication facilities for disaster operations • Provides heavy and light equipment for rescue and recovery operations • Restores destroyed public works, offices, and other buildings.
<p>Department of Social Welfare and Development</p>	<ul style="list-style-type: none"> • Prepares an update of the national relief and rehabilitation master plan in coordination with the National Relief and Rehabilitation Service Committee (NRRSC) and other partner NGAs • Provides technical assistance to LGUs and NGOs on the preparation of disaster prevention, mitigation and preparedness plan for their respective constituents • Provides technical assistance and consultancy services to LGUs, NGOs, and other NGAs for capability building along preparedness, mitigation, relief, and rehabilitation • Provides support to LGUs adversely affected by disasters for relief and rehabilitation • Organizes and deploys organizational crisis or disaster management strike force to augment LGU's capacities in managing disaster operation and rehabilitation planning during major disasters • Provides technical guidance in the conduct of post-disaster evaluation to identify strengths and gaps in disaster management • Organizes an NRRSC with membership duly identified and designated by the NDCC and RDCC • Undertakes linkage and coordination with local, foreign, and multi-donors for disaster management programs.
<p>Department of Tourism</p>	<ul style="list-style-type: none"> • Organizes reaction teams in the department proper and member bureaus and offices • Organizes and trains DCGs and Reaction Teams in hotels, pensions, restaurants, and other facilities.
<p>Department of Trade and Industry</p>	<ul style="list-style-type: none"> • Maintains Bantay Presyo Operation Centers in all regional and provincial offices to address the concerns of the public • Mobilizes the National Price Coordinating Council and Local Price Coordinating Council to develop strategies for stabilizing prices of basic and prime commodities • Strengthens and intensifies monitoring and enforcement activities nationwide to ensure the availability of basic necessities at affordable levels and to ensure compliance with fair trade

NDCC-Member Agency	NDCC Functions
	<p>laws</p> <ul style="list-style-type: none"> Disseminates information on consumer rights and responsibilities, price and supply advisories and guidelines, and other related matters.
<p>Department of Transportation and Communication</p>	<p>Department Proper:</p> <ul style="list-style-type: none"> Coordinates the deployment of transport services during and after the disaster occurrence from the national to the local DCC Mobilizes the regional facilities of DOTC through the RDCC Chairman in disaster areas Mobilizes the manpower, transport and communication facilities of the DOTC Action Center in the disaster area Initiates the immediate restoration of destroyed infrastructure facilities for transportation and communications
	<p>DOTC-ATO-MIAA:</p> <ul style="list-style-type: none"> In coordination with the AFP, undertakes aerial search and rescue operations as needed Coordinates harnessing of private aircrafts, airlines, and other organizations for airlifts and airdrop operations Initiates inter-agency planning for air crashes outside airport facilities especially in built-up areas Initiates inter-agency contingency planning for air crashes within the Ninoy Aquino International Airport (NAIA) jurisdiction area.
	<p>DOTC-NTC-TELOF:</p> <ul style="list-style-type: none"> Harnesses the crisis office of the National Telecommunications Commission (NTC) in case of telecommunication breakdown during disaster Mobilizes the regional telecommunication facilities of TELOF in the areas affected in coordination with NTC and private providers
	<p>DOTC-LTO-LTFRB:</p> <ul style="list-style-type: none"> Deploys and harnesses any available land transport of private operators through the Private Bus Owners Association of the Philippines (PBOAP) in disaster areas to facilitate the evacuation of people Assists and coordinates with LDCC officials and rescue teams to facilitate mobilization of the needed transport vehicles during emergency operations.

NDCC-Member Agency	NDCC Functions
Department of Science and Technology	PAGASA: <ul style="list-style-type: none"> • Organizes and trains DCGs and Reaction Teams in the PAGASA • Prepares and issues advisories and warning bulletins on extreme weather events such as tropical cyclones, El Niño and La Niña episodes, storm surges, floods covering major telemeterized river systems, prolonged and heavy rainfall episodes during monsoons and other similar situations • Provides assistance to the NDMC in times of emergency or as may be required with respect to current weather disturbance • Participates in the conduct of training and researches related to natural disaster preparedness and mitigation.
	PHIVOLCS: <ul style="list-style-type: none"> • Organizes DCGs and Reaction Teams in the institute proper and field stations • Issues advisories on earthquakes, volcanic activities and tsunamis to the general public • Pinpoints suitable evacuation sites in coordination with concerned agencies.
	PNRI: <ul style="list-style-type: none"> • Organizes and trains DCGs in the PNRI office and facilities • Supervises the organization and training of DCGs in nuclear installations and facilitates the storage, handling, and use of radioactive materials • Issues advisories on radioactive fallouts, contamination, and radiation accidents to the public • Decontaminates impacted areas in coordination with concerned agencies.
National Economic and Development Authority	<ul style="list-style-type: none"> • Organizes DCGs and Reaction Teams in the NEDA proper and its attached agencies and Regional Offices • Ensures that disaster concerns are integrated both in the national and local development plans • Provides inputs in the development of national, regional, and inter-regional rehabilitation and reconstruction plans within the context of development planning • Develops damage assessment schemes for agencies surveying post-disaster damages • Determines and analyzes the effects of disasters and calamities on the socio-economic plans and

NDCC-Member Agency	NDCC Functions
	<p>programs of the country</p> <ul style="list-style-type: none"> • Assists in mobilizing resources through technical assistance in the formulation of projects for ODA funding or programming • Monitors through NDCC the situation and progress of activities in disaster-affected and disaster-prone areas and implements appropriate policy and program interventions.
National Housing Authority	<ul style="list-style-type: none"> • Organizes and trains DCGs in NHA offices and homeowners in subdivisions not covered by barangays • Assesses housing requirements of displaced persons • Provides emergency or temporary housing with adequate sanitary facilities • Rebuilds destroyed areas • Plans and sets up new communities as may be required or desired upon.
Philippine Information Agency	<ul style="list-style-type: none"> • Undertakes in cooperation with concerned agencies a continuing information drive on disaster mitigation and control • Establishes a working agreement with media in relaying information, instruction, and warning to the public • Coordinates with mass media in educating the public on disaster management • Distributes bills and posters, including Civil Defense Disaster Publications, and undertakes audio-visual recording of disaster activities in coordination with other implementing agencies.
Philippine National Red Cross	<ul style="list-style-type: none"> • Organizes DCGs in PNRC establishments • Conducts disaster leadership training courses and assists in the training of DCCS and their emergency welfare service units at all levels • Assists in providing emergency relief assistance to victims of disasters • Makes available whole blood and its derivatives during disasters • Interfaces its other emergency welfare services such as warning, rescue, evacuation, medical/nursing, first aid/ambulance, and social services with other member-agencies • Provides local and foreign tracing services during emergencies.
Other Agencies	<p>All other government entities, NGOs, and private organizations not covered shall organize their DCGs and Reaction Teams in their main offices, branches, or attached agencies.</p>

Sources: PD 1566 and 1988 National Calamities and Disaster Preparedness Plan

1.3 Sectoral plans or initiatives that incorporate risk reduction concepts into each respective development area

Water Resource Management

Currently, water resources management in the country is split into two. One aspect is the efficient sourcing and use of water resources; the other is the management of flood risks.

The National Water Resources Board (NWRB) is tasked with the formulation and development of policies on water utilization and appropriation, the control and supervision of water utilities and franchises, and the regulation and rationalization of water rates. The Board is composed of heads of government departments and agencies with no direct claims on water resources. The Department of Environment and Natural Resources (DENR) Secretary acts as chair and the National Economic and Development Authority (NEDA) Director-General as vice-chair. The member agencies include the Department of Justice (DOJ), Department of Finance (DOF), Department of Health (DOH), and the National Hydraulic Research Center, University of the Philippines (UP-NHRC).

The responsibilities for the management of flood risks are shared by the members of the NDCC. The Flood Forecasting Branch of the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) prepares and disseminates flood forecasts and warnings for the major river basins. The Flood Control Division, Bureau of Construction of the Department of Public Works and Highways (DPWH) undertakes the engineering design of flood control systems. The Office of Civil Defense (OCD) compiles data on flood casualties and damages and trains the local government executives on contingency planning and emergency response.

The NWRB is currently considering the inclusion of flood risk management in its mandate.

Poverty Alleviation

In 2000, 28.4 % of the total population lived below the poverty line. This reflected a worsening of poverty due to the 1998 financial crisis and El Niño. The bulk was distributed in the rural areas, *i.e.*, 41.4 % of the rural population. Of this number, 67.8 % depended on agriculture. Only 15 % of the urban population was poor (National Census and Statistical Board).

The government's protection and intervention strategies for the poor are classified into three, namely, social assistance and welfare, social security, and social safety nets. The social assistance and welfare are regular government programs that involve actual resource transfers to the poorest groups in order to prevent their economic dislocation arising from violence, illness, disability, old age, unemployment, resettlement, and harvest failure. Social security involves social insurance programs that reduce the risks of the poor due to old age, work-related injury, illness, and disability. Social safety nets are short-term bridging

mechanisms to disadvantaged and vulnerable groups. The objective is to protect them and strengthen their capacity to cope with the effects of disasters and calamities, among others.

The government also maintains a socialized housing program, especially for the urban poor. The Medium-Term Development Plan for 2001 to 2004 targets a total of 880,000 informal and non-settlers for socialized housing package. Priority is accorded to those living in dangerous areas such as riverbanks and other flood-prone areas, those in right-of-way of government infrastructure projects, and those under threat of demolition.

Climate Change Adaptation

Initial studies on the impacts of climate change in the Philippines with respect to temperature and rainfall have been completed (The Philippines' Initial National Communication on Climate Change, 1999). The vulnerability to these impacts of certain sectors like rice and corn production, two major water resources, coastal resources, forestry, and public health were assessed. Based on the vulnerability assessments and various sectoral consultations, adaptation measures and strategies were identified.

The adaptation strategies for agriculture encompass economic, technological, institutional, and research aspects. Some strategies incorporate risk reduction concepts. These include natural rainfall management, cropping pattern adjustment according to the onset of the rainy season and the observed frequency of tropical cyclones, and improvement of post-harvest and bulk handling facilities.

The adaptation measures for coastal resources also incorporate risk reduction aspects. Examples are mangrove resources development; public easements and buffer strips; inclusion of wetlands, swamps, and marshes in the National Integrated Protected Area System (NIPAS); development of a multi-hazard mitigation and protection plan for coastal areas; and requirement of geological, hydrometeorological and structural engineering evaluation as part of the environmental impact assessment of coastal development projects.

The adaptation measures for water resources involve both the supply and demand sides. The measures with a risk reduction orientation are the introduction of low water use crops and efficient farming practices; enhanced irrigation efficiency, and improvement of monitoring and forecasting systems for floods and droughts.

Education

Disaster awareness is part of the learning core competencies under Science in public elementary and high schools. The curricula and textbooks, "Science and Health 6" and "Science and Technology I", were developed in collaboration with the disaster management agencies such as the PHIVOLCS and PAGASA. Both

agencies also train the public school teachers on natural hazards, preparedness, and other disaster concepts.

For the general public, hazards awareness and preparedness are communicated through various print materials, comic books, brochures, and posters. In 2002, a movie/TV plug about proper earthquake precautionary measures was shown in theaters and government TV station nationwide. In 2004, the showing of a movie/TV plug about precautionary measures during tropical cyclones is underway.

Innovative teaching materials have also been developed. In 1990, PHIVOLCS came out with a video titled "The Killer Quakes" which highlighted the impacts of the 1990 earthquake. Another video package titled "The Earth Trembled ... then Killer Waves Came!" featured the impacts of the 1994 Mindoro earthquake. In 2001, to let people experience an earthquake, the Earthquake Simulator was fabricated. The simulator is a small booth complete with a table and stools. A machine simulates earthquakes at different intensities (Villegas and Saquilon, 2004).

Development Planning

Development planning in the Philippines is linked to a National Physical Framework Plan (NFPF). The NFPF provides the broad framework for the use of land and other physical resources. Four uses are possible, namely:

- Protection land use which is concerned with the rehabilitation, conservation, development, and management of the country's critical ecosystems
- Production land use which refers to the utilization of land resources for crop production, agro-forestry, grazing, pasture, mining, fishing, industry, and tourism
- Settlements development which seeks to promote an orderly and efficient distribution of population and services and
- Infrastructure development which pertains to the allocation of land for priority development.

Under the NFPF, natural hazards are part of the environmentally constrained areas for which a multi-hazard mitigation plan is required.

The Regional Physical Framework Plan (RFPF) maps the hazard-prone areas within the region and it defines the hazard type as well as the land use suitability. The provincial, city, and municipal land use plans are supposedly more precise with respect to the location, characteristics, and management of the hazard.

The lack of maps and related information is a constraint in the proper integration of hazards in land use plans. In some cases, local planners lack the experience and knowledge on technical aspects. For the urban areas, informal settlements

are tolerated or even encouraged for political purposes. For these cases, land use management fails to consider natural hazards.

1.4 ✓ **Incorporation of disaster risk reduction in the national plan for the implementation of the UN Millenium Development Goals (MDGs), Poverty Reduction Strategy Paper, National Adaptation Plans of Action, National Environmental Action Plans, and WSSD Johannesburg Plan of Implementation**

UN Millenium Development Goals

The MDGs have been adopted to eliminate extreme poverty in the country. By eliminating poverty, vulnerability is reduced and disaster risk is reduced accordingly. The Philippine National Plan for the MDGs does not include an explicit component on disaster risk reduction.

Poverty Reduction Strategy

KALAHI, the government's centerpiece antipoverty program has five major strategies. These are:

1. Asset reform by redistributing physical and resource assets to the poor, especially land and credit;
2. Human development services by strengthening the capacities of the poor through increased public spending on basic social services and raising the poor's access to basic services;
3. Employment and livelihood opportunities by creating jobs through agriculture and fisheries activities and providing seed capital to micro and small businesses for the poor;
4. Participation of basic sectors in governance by strengthening political participation and cultural expression of basic sectors and communities and
5. Social protection and security against violence by reducing the risk and vulnerability of the poor to the immediate effects of economic shocks and natural and human-caused disasters.

Success in each of the strategies may reduce vulnerability to natural hazards. However, the reduction of vulnerability is not adopted as a major component.

National Environmental Action Plans

The Philippines implements since 1978 the environmental impact statement (EIS) system for proposed environmentally critical projects or projects within

environmentally critical areas. In 2000, the DENR required from proponents of subdivision, housing, and other land development and infrastructure projects an Engineering Geological and Geohazard Assessment Report (EGGAR). The EGGAR is an additional requirement on top of the EIS. This has allowed the full consideration of geohazards in the siting and design of buildings and structures.

As a result of the December 2003 landslides, DENR mobilized the Mines and Geosciences Bureau (MGB) and the Forest Management Bureau (FMB) to undertake geohazards mapping and mitigation works planning, respectively. The target areas were the highly urbanized, densely populated, and rapidly developing areas in the three key regions at risk from geohazards. Consultations with the LGUs and other national government agencies were conducted as part of the field activities.

The geohazards mapping is supported by the UNDP. The mitigation works will be funded out of DENR's regular budget in 2005.

1.5 Building codes of practice and standards that take into account seismic risk

The country's building code provides a framework of minimum standards and requirements for all buildings and structures. The standards guide, regulate, and control the building's location, siting, design, quality of materials, construction, use, occupancy, and maintenance including its environment, utilities, fixtures, equipment, and mechanical-electrical, and other systems and installations. The code operates through a Building Permit which is issued by either the Municipal or City Engineer.

The code has not been amended since 1972. An updating is necessary in view of modern technology, new construction products and materials, and findings in natural and man-made hazards and behavior of materials under these stresses. There are also problems in code enforcement especially for the small to medium-sized buildings. This is due to the limited authority and qualifications of building officials.

Although the building code has not been amended, its referral code, the National Structural Code of the Philippines (NSCP), has been revised regularly. The latest revision was in 1992.

The 1992 version discusses the basic concepts of seismic design and it prescribes the minimum standards for design and construction of earthquake resistant structures. Excluded, however, are the earthquake-induced ground failure problems such as liquefaction.

1.6 Annual budget for disaster risk reduction

The national government's annual appropriations provide specific budgets for risk identification, preparedness, and structural mitigation. This is in addition to budgets for emergency response and rehabilitation.

Risk Identification

Budgets for risk identification are spread among four agencies. These are PAGASA, PHIVOLCS, MGB, and EMB.

PAGASA is the agency charged with the functions of climate data management, agrometeorological and weather modification research and development; installation, repair, and maintenance of telemetering multiplex system for flood forecasting and warning covering Pampanga, Agno, Bicol, and Cagayan River basins; weather and flood forecasting and geophysical and astronomical services; observation and acquisition of data for atmospheric, geophysical and allied services; and research on atmospheric, geophysical, and allied sciences.

PHIVOLCS has several functions, namely, operations and development of volcanological and geophysical observatories; volcano eruption prediction research and development; earthquake monitoring and documentation; earthquake prediction study; volcanological, seismological, and geophysical instrumentation research and development and maintenance; geology, petrology, and geophysical studies of volcanoes, etc.; geological and geophysical study on active faults, shear zones, landslides, earthquake effects, etc.; and study on vulnerability and risks and update of disaster preparedness plan and disaster reduction action programs.

MGB is assigned the function of assessing geohazards in the country including the evaluation of EGGARs submitted by land developers to support their applications for environmental compliance certificates (ECCs). In deference to PHIVOLCS, the geohazards handled by MGB exclude volcano- and earthquake-related hazards. Study areas are selected based on population density and actual and projected development.

EMB is the agency tasked with implementing the environmental laws of the country, the most important of which are the EIS system, pollution control, and toxic substances and hazardous waste management. EMB is supported by the MGB in the enforcement of environmental laws, rules, and regulations of the country on mining and mineral processing projects.

Preparedness

OCD, the operating arm and secretariat of the NDCC, maintains offices in the sixteen (16) regional centers of the country. Its mission is to coordinate, on the national level, the activities and functions of government, private institutions, and

civic organizations for the protection and preservation of the civilian populace and property during times of war and other emergencies of equally grave character. The OCD also maintains a database on disasters.

Structural Mitigation

The DPWH undertakes the planning, design, construction, and maintenance of roads, bridges, flood control, water resource projects, and other public works.

1.7 Participation of private sector, civil society, NGOs, academia, and media in disaster risk reduction efforts

PD 1566 limits the membership of non-government entities to only the PNRC. However, this has not prevented a few groups from the private sector, civil society, and academia from participating in the technical working group activities of the Council.

Private Sector

Private corporations, business associations, and corporate foundations participate through the Corporate Network for Disaster Response (CNDR). Composed of 27 member-organizations, CNDR has the following programs:

- Prevention, Mitigation, and Preparedness (PMP) – CNDR believes that preparedness is the most cost-effective response to disasters.
- Institutional Capability Building Program – This assists the member-organizations develop the appropriate disaster response programs. It also strengthens alliances and optimizes the use of pooled resources for disaster response.
- Emergency Response – During disasters, CNDR helps organize and coordinate the flow of relief goods and efforts. The activities include disaster monitoring, volunteer mobilization, donors' forum, and provision of food and non-food relief items.
- Rehabilitation – CNDR manages three permanent resettlement sites in Pampanga for 750 households. The house and lot amortization and income of the households are used to fund community-based activities such as maintenance of water and power facilities, drainage system, collection, road network, land titling, and capability building.

NGOs

NGOs are active in disaster mitigation, preparedness, relief, and rehabilitation. On disaster mitigation and preparedness, their methods and practices vary from

simple on-site specific strategies to a nationwide coverage. These are summarized as follows (Luna, 2001):

- Infrastructural mitigation strategies – NGOs with substantial funding undertake small-scale and community-based projects such as shelter provision and assistance, protective walls, dike construction, footpath and footbridge building, and sand bagging. The beneficiaries provide labor and materials available in the community.
- Community-based disaster management – Generally, this comprises community organizing and capability building, hazards and vulnerability analysis, training on disaster management, and the formation of committees for disaster response in case there are none. Other NGOs provide technical and financial support for CBDM. Still others undertake socioeconomic projects that aim to reduce vulnerability. Examples are soft loans for agricultural production; animals, farm tools, and boat distribution; cooperatives; assisting the urban poor to secure land; community mortgages; health care and educational services.
- Capacity building – Capacity building programs target either the community or the LGU. Training programs for the community cover orientation to disaster management, disaster preparedness, para-legal training, community organizing, evacuation management, emergency response, health and sanitation, environmental education and simulation exercises. The programs for LGUs are for planning, reorganizing and strengthening coordinating institutions, and mobilizing NGOs and the private sector during disasters.
- Advocacy – NGOs advocate for the integration and mainstreaming of disaster management in government development strategies. This involves the popular participation in planning processes, advocacy for children's rights, gender issues, environmental implications, and encouraging LGUs to provide budget for disaster mitigation and preparedness.

An increasing number of NGOs are entering into partnerships with the government in the implementation of disaster management programs. This is because of the recognition that the government, especially LGUs, has a pivotal role in disaster management.

Figure 4 shows the various agencies and their focus in disaster management.

2 Risk Identification

2.1 Hazard mapping and assessment

Hazard mapping and assessment have been undertaken for earthquakes, volcanoes, landslides, and hydrometeorological hazards.

NDCC

OCD

Policy

Preparedness

Mitigation

Response

Rehabilitation

NGA

NEDA - integration of disaster control in development plans
- damage assessment schemes
- formulation of projects for ODA

Risk Identification

PHIVOLCS - hazard assessment for earthquakes and volcanoes
PAGASA - hazard assessment for climate
MGB - geohazard assessment and EGGAR
EMB - EIA and ERA
Community based disaster management and VCA
EIA and ERA

Preparedness

OCD - organization of LDCCs
OCD and DSWD - training of LDCC
DECS - public education campaign
DTI - training in large commercial buildings
PAGASA/PHIVOLCS/DOH - early warning systems
PIA - public information campaign
DBM - rules and regulations on inclusion of preparedness in annual investment plan of LGUs
LDCC - preparation of DMPs/sheltering shelter facilities, evacuation plans, resources canvassing, communications and warning systems, drills
Community based disaster management and VCA

Mitigation

DPWH - physical and structural mitigation measures
DENR - EIA, ERA and EGGAR, Pollution control, reforestation and rehabilitation
GEUP - zoning ordinance, and building code
Community based disaster management
ASEP - technical assistance on structural design
EMP, ERMP

Risk Transfer

PCIC - crop insurance
GSIS - insurance of public structures and facilities
Earthquakes, typhoons, fire insurance

Response

NDCC - emergency response
LDCC - emergency response such as rescue/evacuation, first aid and medical services, emergency shelter, police and fire awareness, price stabilization.
Humanitarian assistance
Humanitarian assistance

Rehabilitation

DPWH - reconstruction of damaged public infrastructure
DSWD - counseling of disaster victims
DA/OCD - damage assessment
NHA - emergency, temporary, permanent housing
GSIS - payment of claims
NDCC - NCF
DENR - incorporation of disaster mitigation components in reconstruction activities
LDCC - LCF
- Resettlement site
- Payment of damage claims



Earthquakes

For seismic hazards, regional susceptibility maps at 1:250,000 scale are available for the following:

- Ground rupture
- Ground shaking
- Liquefaction
- Earthquake-induced landslide and
- Tsunamis.

Figures 5, 6, and 7 are regional susceptibility maps for liquefaction, earthquake-induced landslides, and tsunamis, respectively. *Figure 8* shows the epicentral location and particulars of significant earthquakes from 1608 to 2002.

The detailed seismic hazards map for Metro Manila has been completed through the JICA-funded MMEIRS. The detailed seismic hazard mapping for the other cities is in the pipeline.

For active faults, detailed mapping for Central Luzon and Masbate is ongoing.

Tsunami modeling has been done for the Manila Bay and Moro Gulf system. PHIVOLCS plans to speed up its tsunami modeling and public education campaign through foreign assistance. Targeted are the high-risk areas in terms of population and economic loss. These include Cotabato City, Pagadian City, Zamboanga City, General Santos City, Metro Manila (Navotas, Manila, Pasay, Cavite), Eastern Luzon (Baler and Infanta, Aurora), Bicol peninsula, Eastern Samar, Mindoro, Western Pangasinan, and the Visayas (e.g., Bohol and Tacloban City).

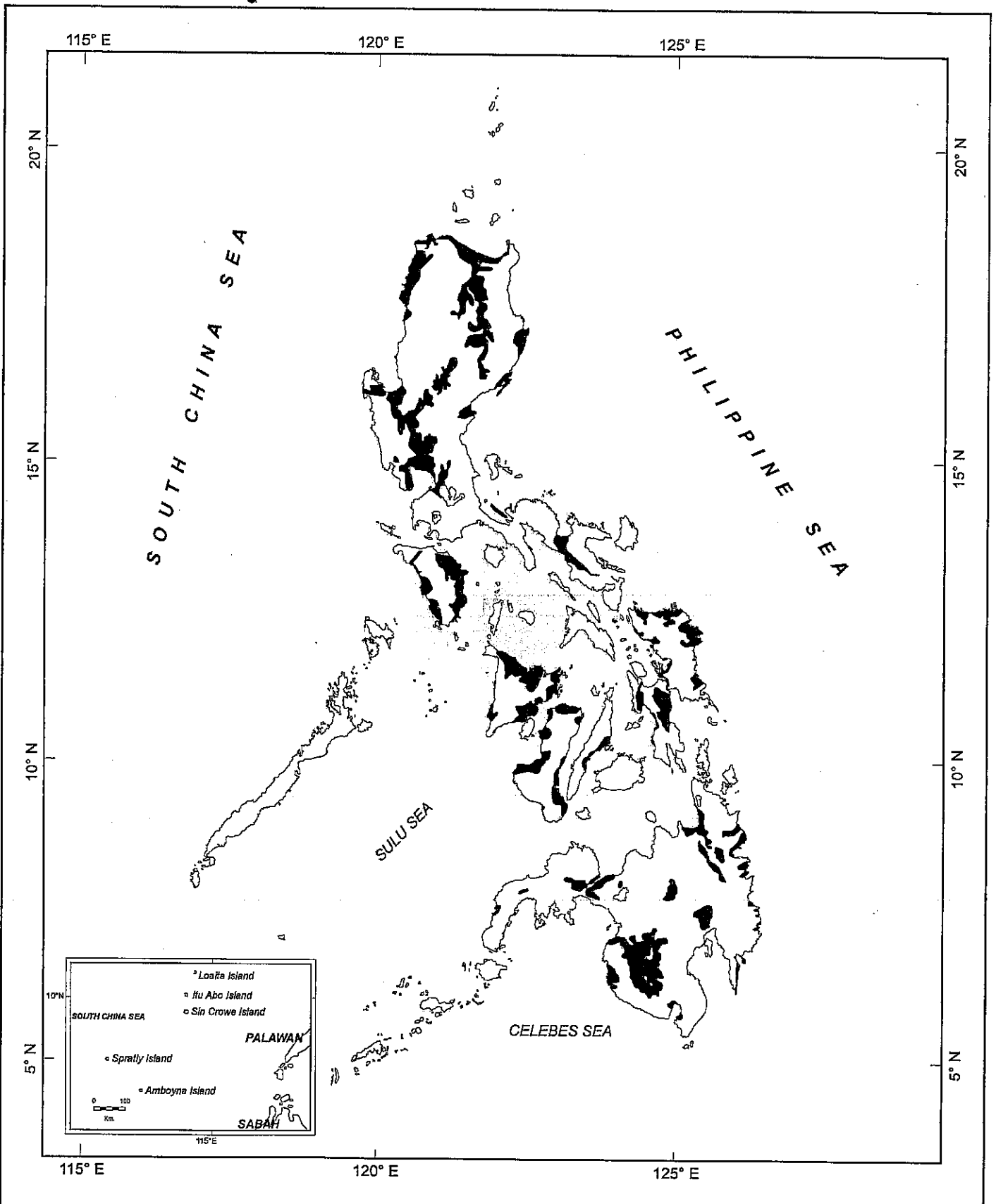
Volcanic Hazards

For volcanic hazards, of the 22 active volcanoes of the country, PHIVOLCS has completed the geohazard maps for eleven (11). The maps are in 1:50,000 and 1:10,000 scale. *Figure 9* is a geohazard map for the Pinatubo Volcano.

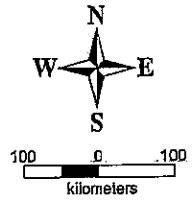
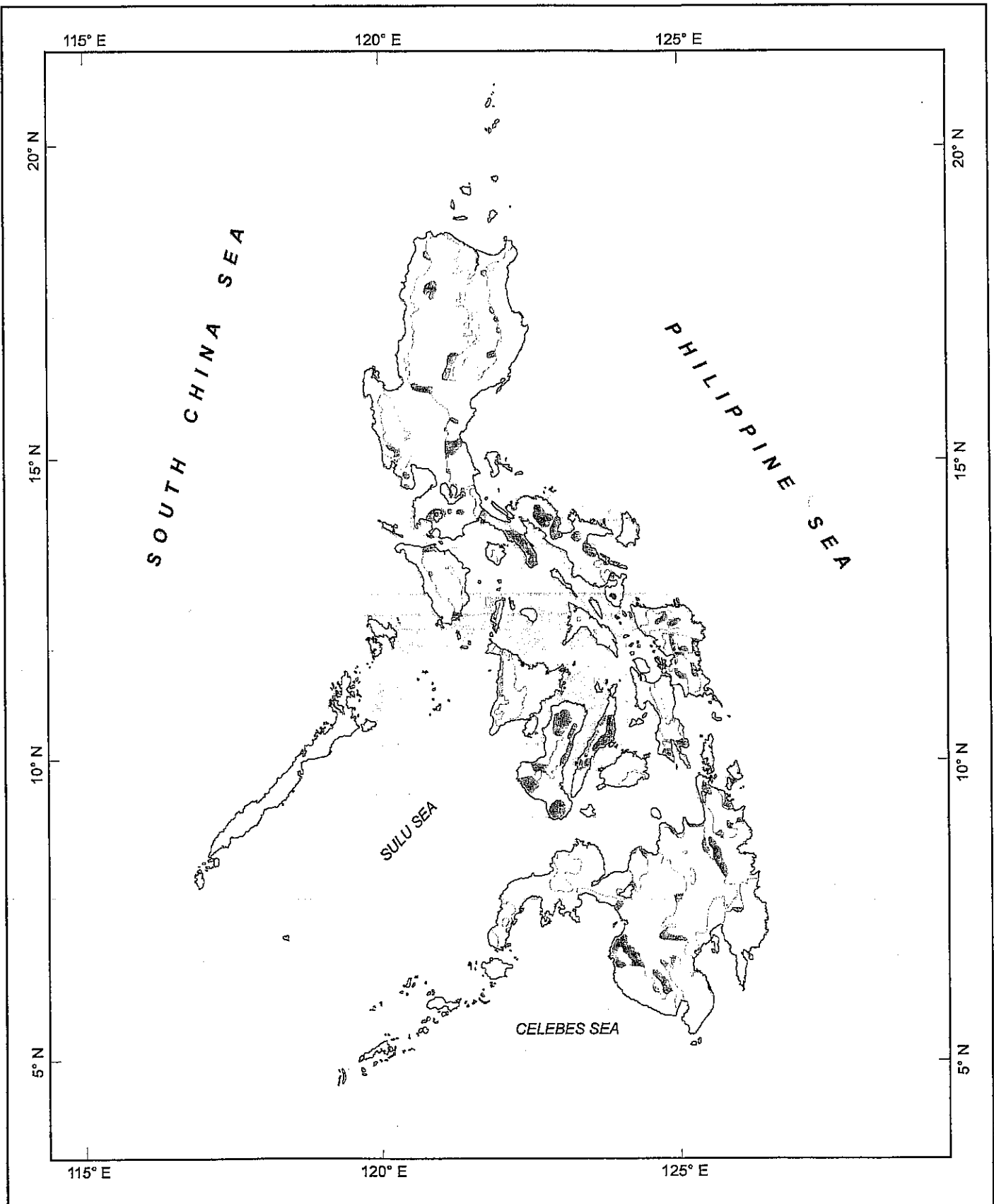
Landslides

The MGB is responsible for the mapping of geohazards except those which are earthquake- and volcano-related.

Geohazard mapping at 1:250,000 scale is done for regional planning requests only. Maps of such scale have been completed for Mindoro Island, Bicol Region, Samar Island, and northern Mindanao (Manipon, 2004).



	<p>Map Projection: Latitude - Longitude</p> <hr/> <p>Source: PHIVOLCS</p>	<p>LEGEND</p> <p> Liquefaction Prone Area</p>
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Map Projection:
Latitude - Longitude

Source:
PHIVOLCS

LEGEND

- No Present Risk
- Low Danger Zone
- High Danger Zone

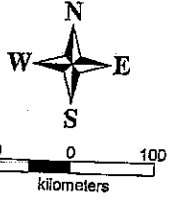
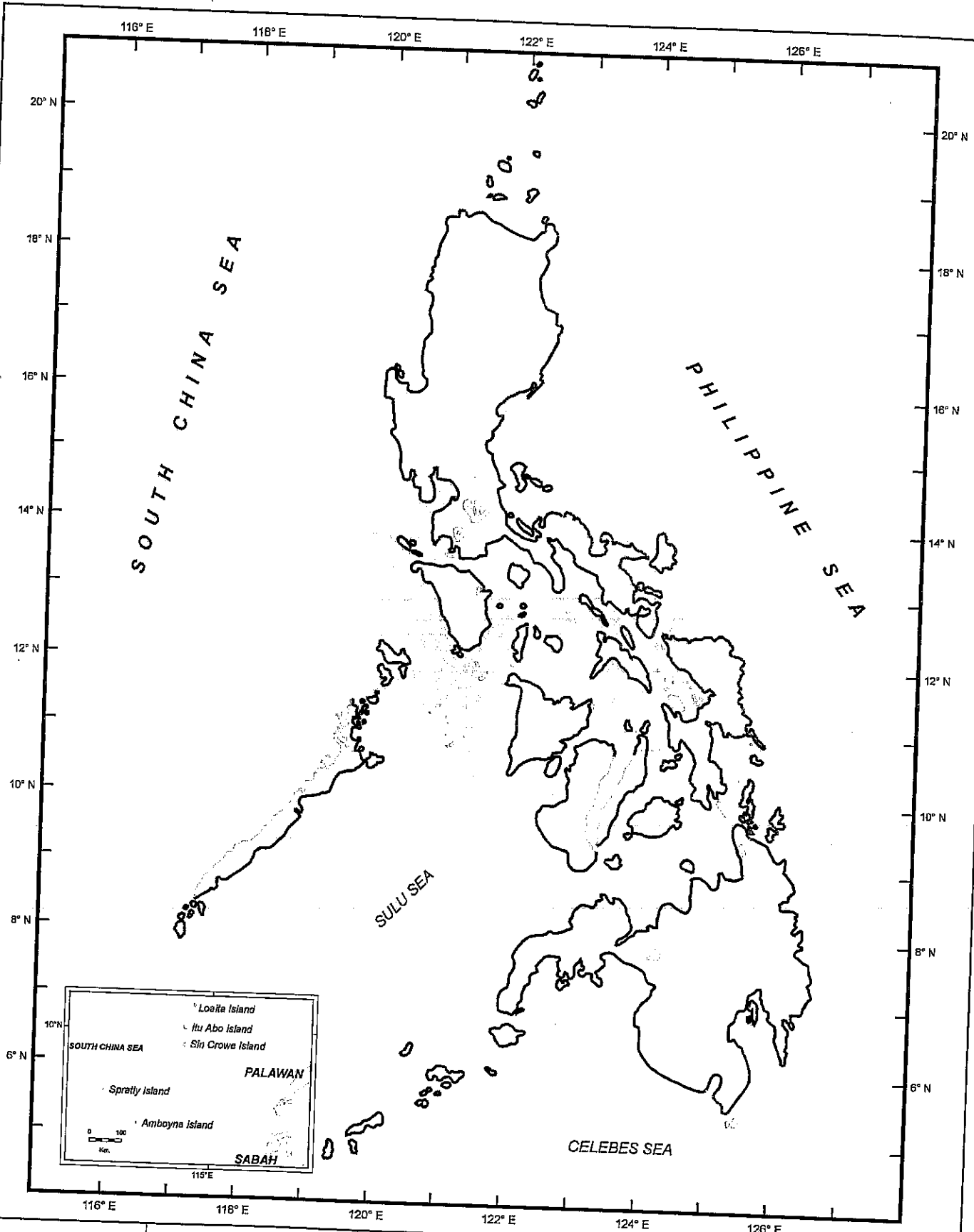


NATIONAL DISASTER COORDINATING COUNCIL

Earthquake-Induced Shallow Landslide Hazard Map

Philippine Report on Disaster Reduction

Figure No.

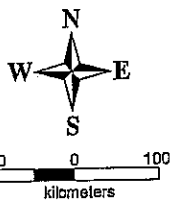
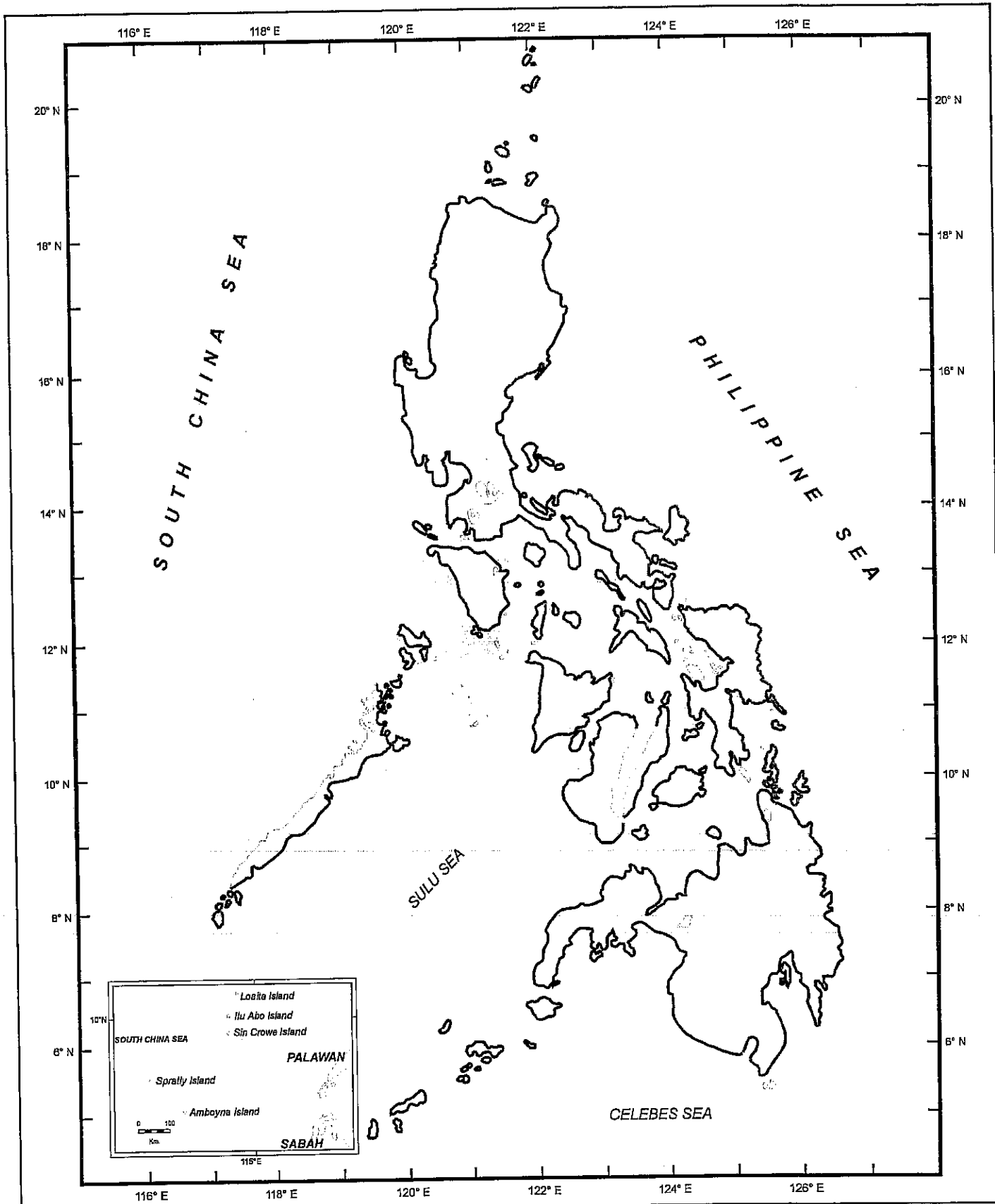


Map Projection:
Latitude - Longitude

Source:
PHIVOLCS

LEGEND

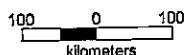
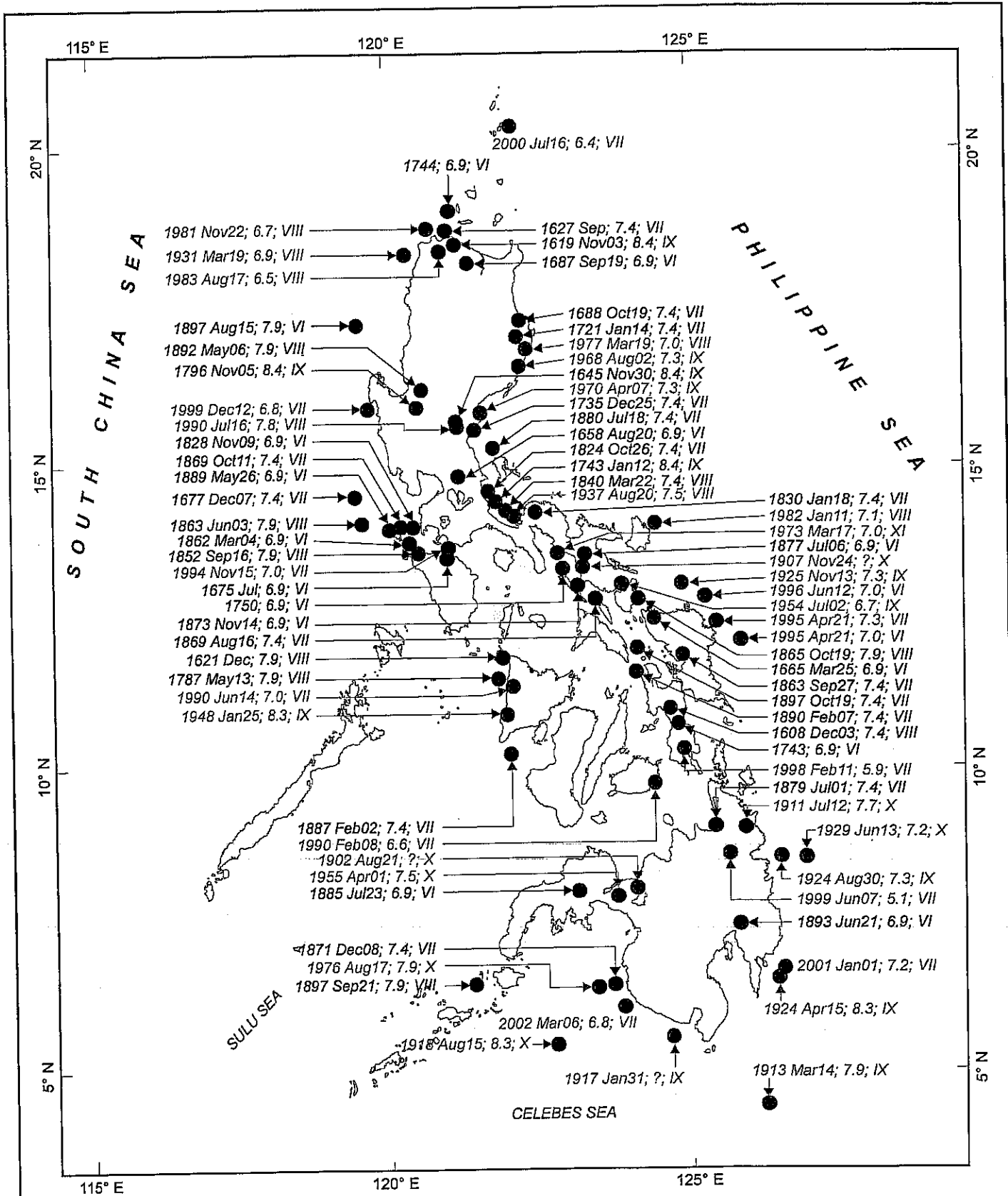
- Potential/Local Generator
- Potential/Local and Foreign Generators
- Historical Tsunami Potentially High



Map Projection:
Latitude - Longitude

Source :
PHIVOLCS

- LEGEND**
- Potential/Local Generator
 - Potential/Local and Foreign Generators
 - Historical Tsunami Potentially High



Map Projection:
Latitude - Longitude

Source:
PHIVOLCS 2002

LEGEND

- Historical Earthquake
- Instrumental Earthquake
- 1897 Sep21 Date of Occurrence
- 8.4 Magnitude
- IX Maximum Intensity

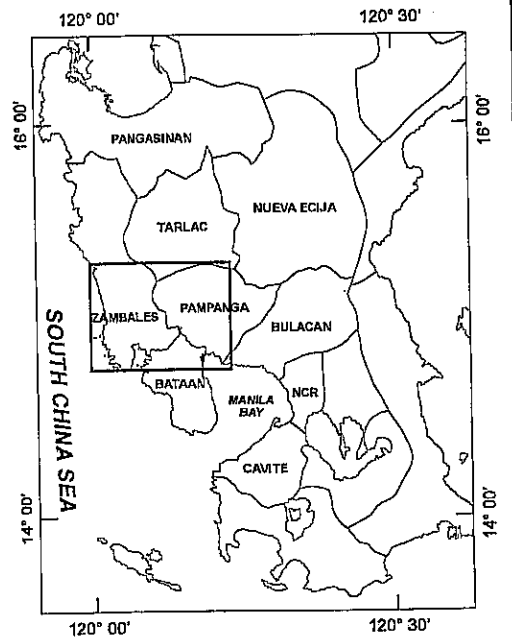
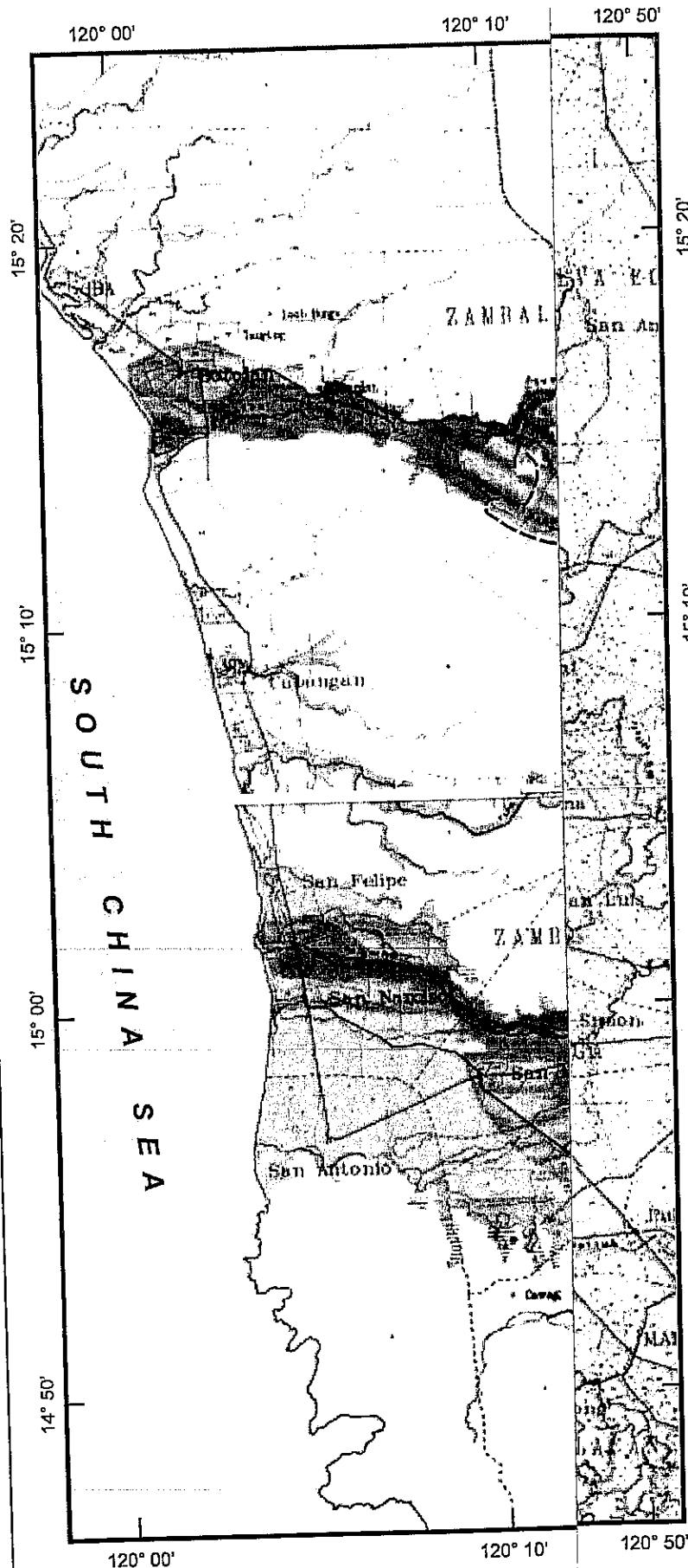


NATIONAL DISASTER COORDINATING COUNCIL

Philippine Significant Earthquakes 1608 - 2002

Philippine Report
on Disaster Reduction

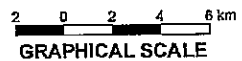
Figure No.



INDEX MAP



Map Projection:
Latitude - Longitude



LEGEND :

- Areas covered by lahar from 1991 to 1995
- Lahar dammed lake/ponded water
- Areas at high risk to lahars and associated flash floods
- Areas at low risk to lahars but at high risk to floods and/or excessive siltation
- Areas safe from lahars but at moderate risk to flash floods and/or excessive siltation
- Areas safe from lahars but prone to persistent (>1 week) or recurrent (back) flooding with sedimentation merely confined to river channels
- Regional flood prone areas due to high precipitation, siltling up to river channels for lahars and remobilized 1990 Northern Luzon Earthquake landslide debris.
- Provincial capital
- City
- Municipality
- Upland resettlement
- Lowland resettlement
- Armored section of dike
- Unarmored section of dike
- Ongoing construction of dike (unarmored)
- Coastline
- Provincial boundary
- Municipal boundary
- Barangay boundary
- River and tributary
- Major road
- 1991 Pinatubo Crater Rim
- Hazard zone for pyroclastic flows and surges for Pinatubo Volcano

NOTES:

1. Hazard boundaries are approximate.
2. Deposits at Cabangan are the result of the remobilization of ashfall deposits in 1991.
3. Some areas inside hazard zones may not be affected in the short-term but may be affected in the long-term. Other areas may be affected at all.
4. This map assumes no engineering interventions.
5. Areas prone to lahar deposition were delineated from projected volume of pyroclastic flow that may be eroded and mobilized.

Map Sources:

PHILVOLCS LAHAR HAZARD DATA, APRIL 1997
 DPWH-NSO BARANGAY BOUNDARIES, 1970
 USGS DEFENSE MAPPING AUTHORITY MAPS, 1988
 NEDA III FIELD DATA & DPWH DIKE ALIGNMENT, 1991 & 1995

Geohazard mapping at 1:50,000 scale is targeted at the major urban centers. Available maps cover Metro Manila, Baguio, Cavite, Olongapo, Cebu, Zamboanga, Davao, Cagayan de Oro, Butuan, and San Francisco, Agusan (*Ibid.*).

Geohazard mapping at 1:10,000 scale has been completed for Baguio City and Camarines Norte (*Ibid.*). In addition to the efforts of the MGB, private and public developers or proponents of subdivisions, housing, and other land development and infrastructure projects conduct detailed geohazard mapping in support of their ECC applications. The mapping results are contained in the EGGAR which is submitted to the MGB.

The mapping gaps of the MGB include 130 quadrangle maps at 1:50,000 scale covering the urban and rural centers. In addition, about 18 priority sites per region or a total of 252 sites need to be mapped on a detailed scale (*Ibid.*).

To accelerate the geohazard mapping works of MGB, UNDP released P 2.24 million for the Pilot Geohazards Project. The target areas are the highly urbanized, densely populated, and rapidly developing areas in the key regions at risk from geohazards. These include NCR and Eastern Rizal, Naga - Legaspi, Tacloban - Ormoc, Cagayan de Oro - Ginoog coastal strip, Davao - Tagum, and Surigao City - Butuan City.

Hydrometeorological Hazards

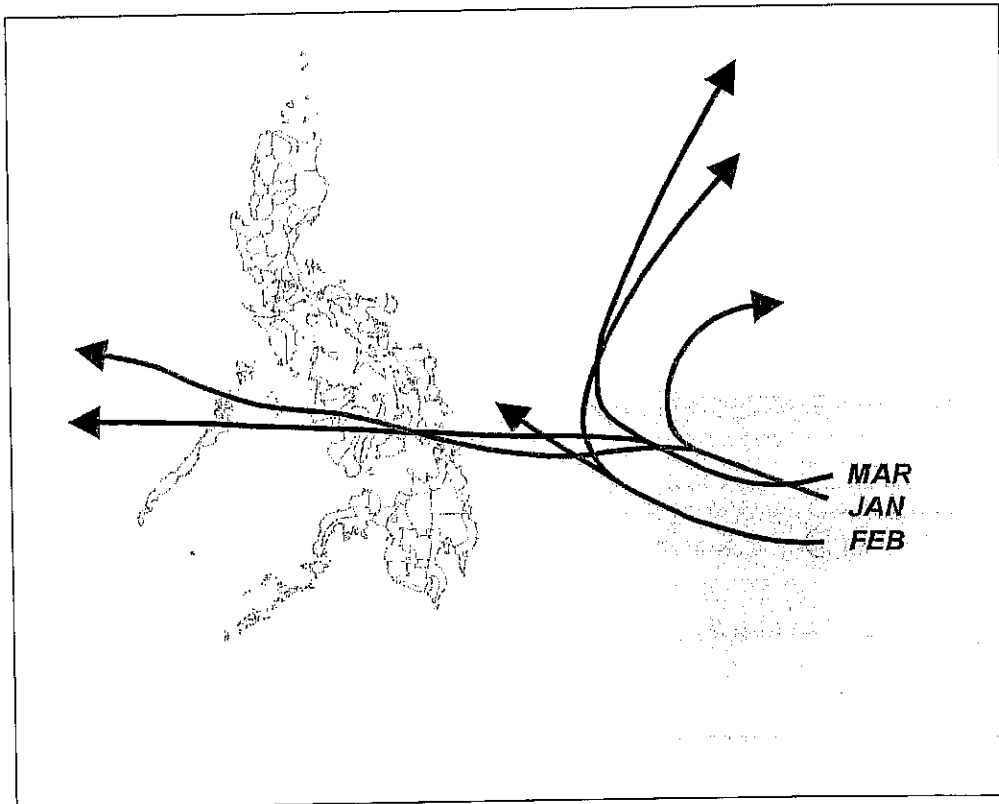
For the entire country, PAGASA generated the following maps:

- Extreme wind hazard map
- Extreme rainfall hazard map
- Thunderstorm hazard map
- Storm surge map and
- Tropical cyclones path map.

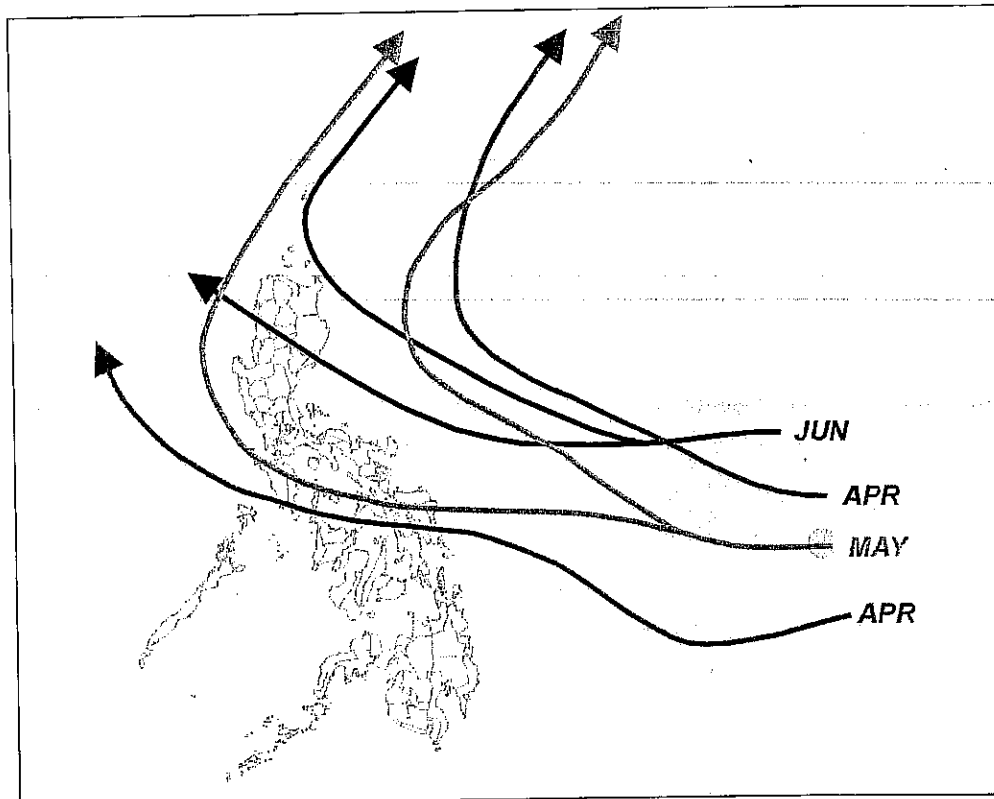
Figure 10 shows the average monthly path of tropical cyclones that enter the Philippine area of responsibility.

PAGASA undertakes flood hazard and vulnerability mapping activities in a very limited scale. Covered by these mapping activities were Taguig in Metro Manila and the eight (8) coastal towns in Bataan.

Villarín (2004) also generated countrywide hazard maps for typhoons (*Figure 11*), El Niño and La Niña episodes (*Figure 12*).



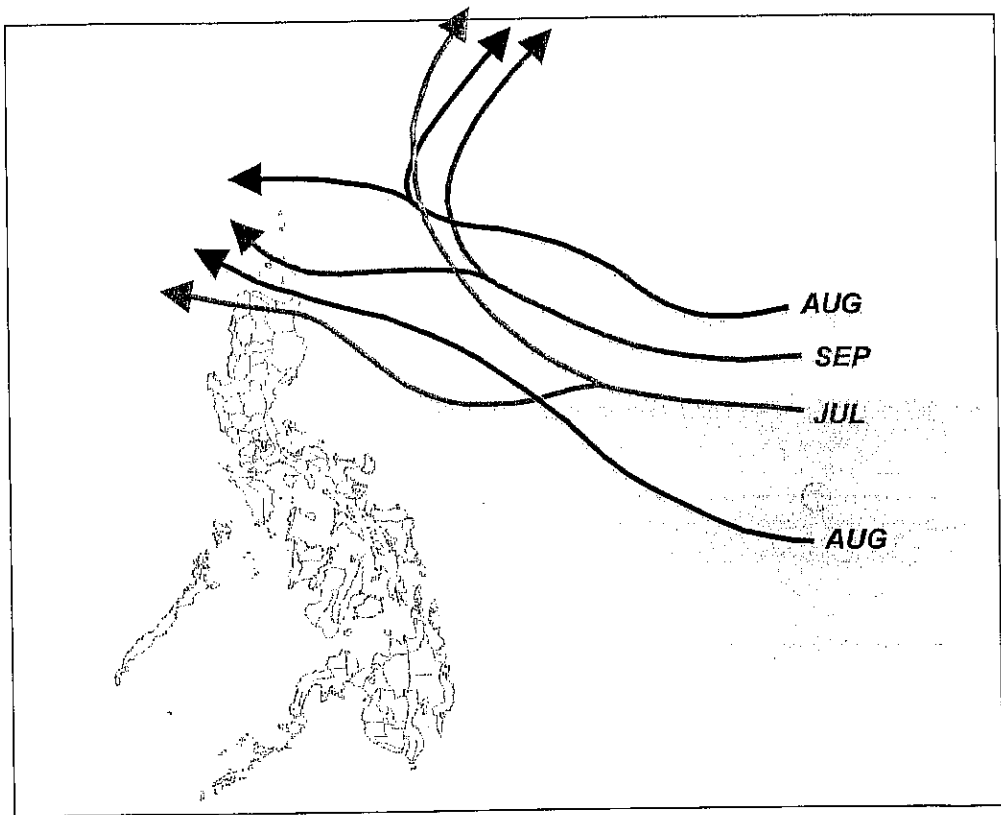
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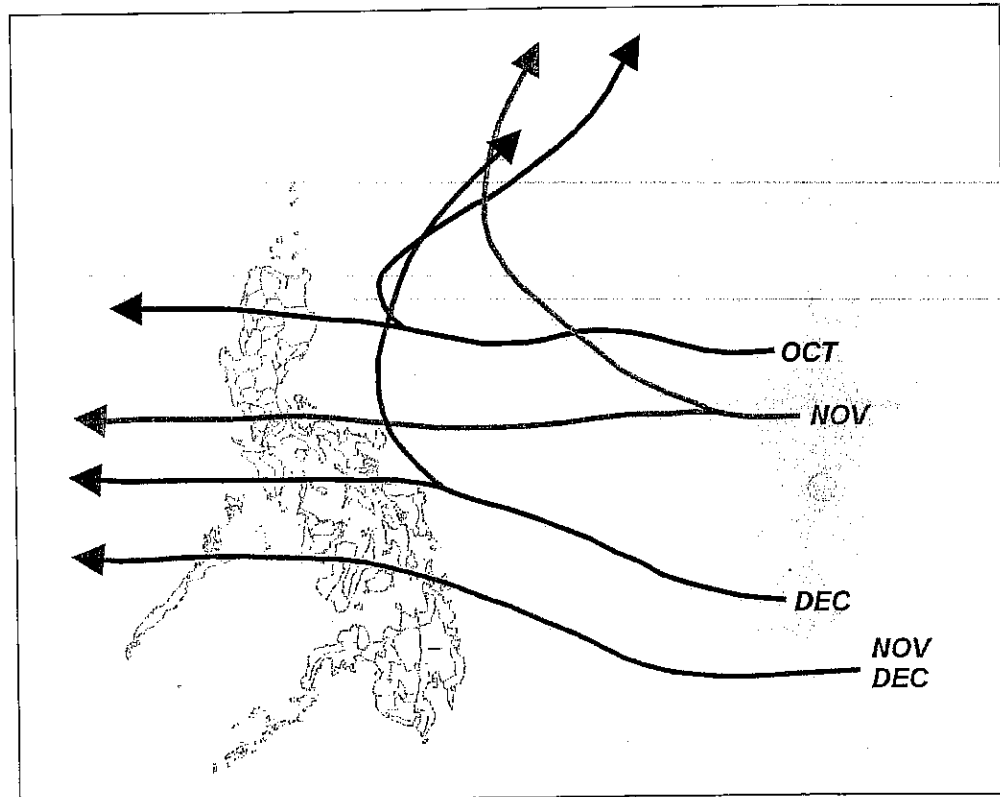
2nd Quarter

Source : Valenzuela 1989



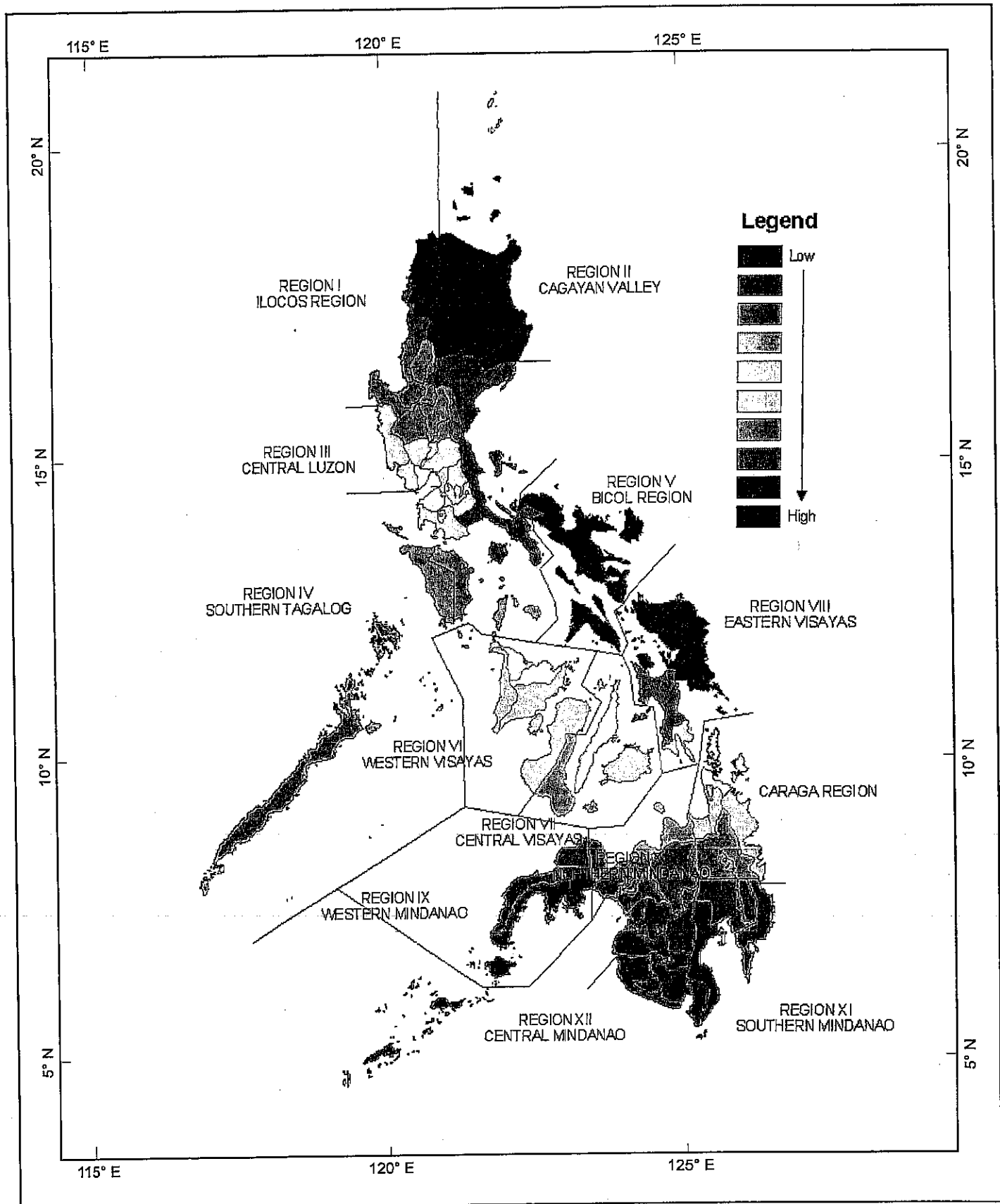


3rd Quarter



4th Quarter

Source : Valenzuela 1989



100 0 100
kilometers

Map Projection:
Latitude - Longitude

Source:
Villarín, 2004



NATIONAL DISASTER COORDINATING COUNCIL

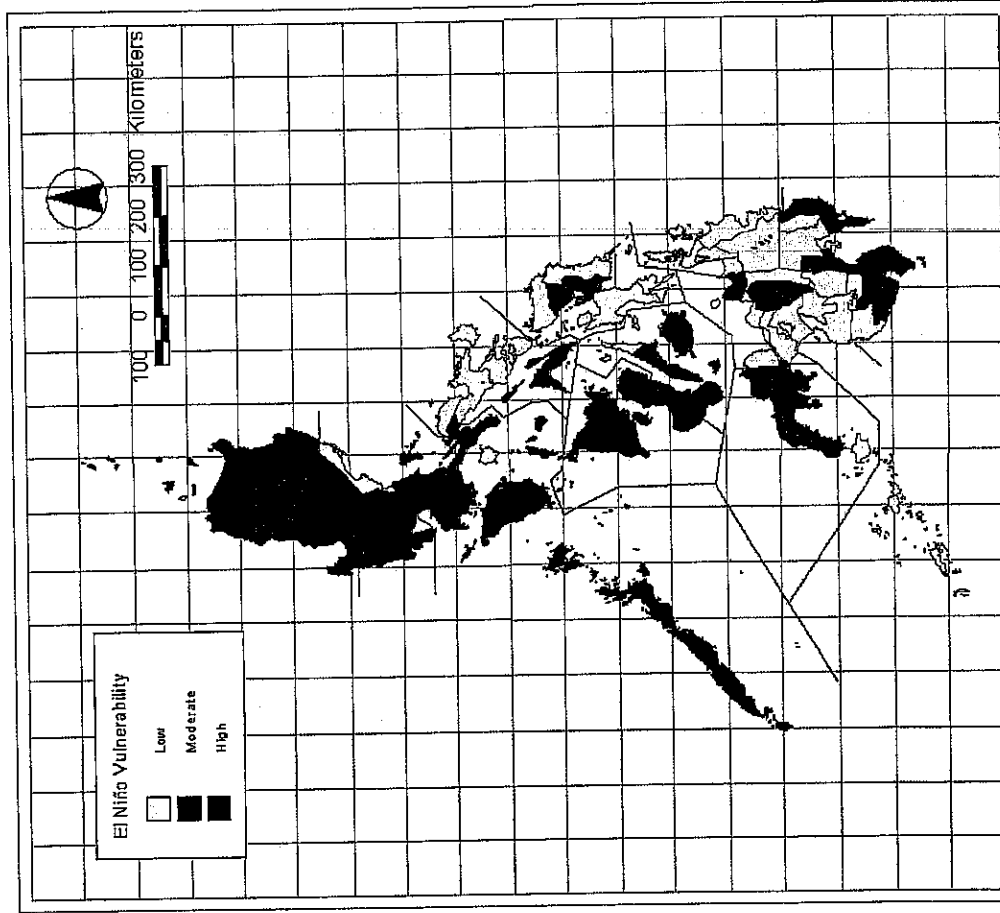
Typhoon Vulnerability

Philippine Report
on Disaster Reduction

Figure No.

11

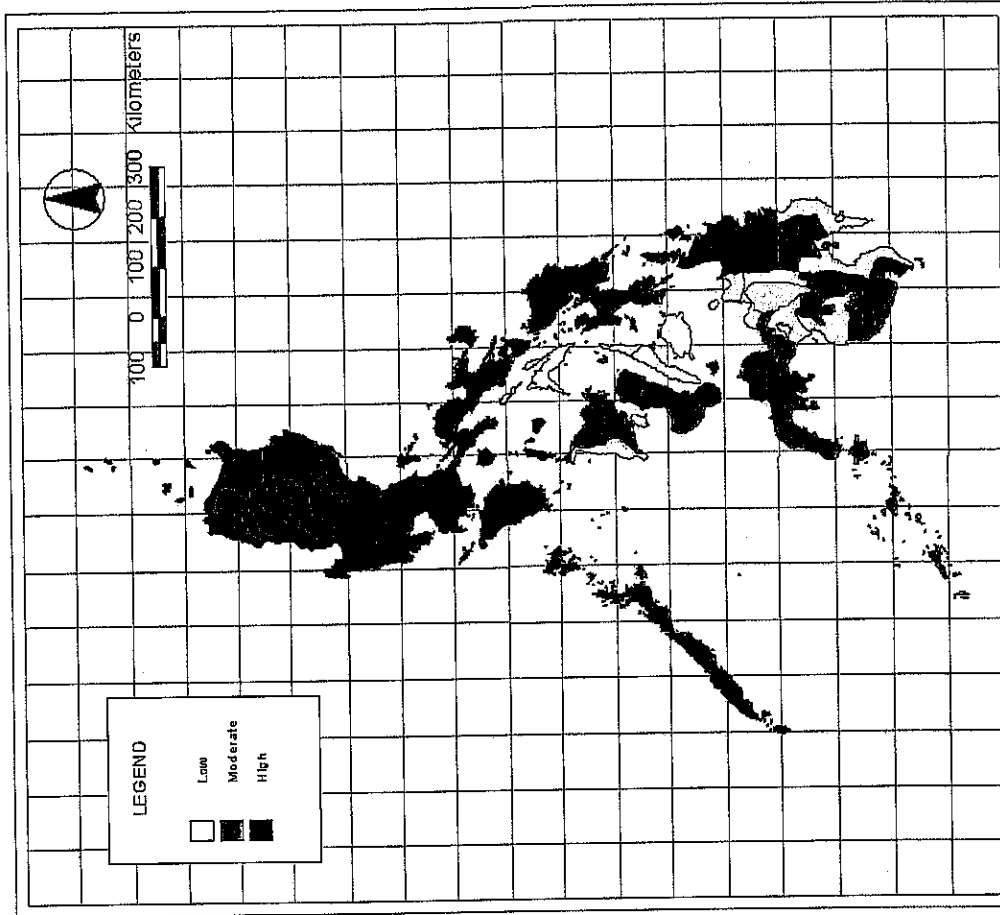
El Niño Vulnerability Map



Source :
 • Base Map with Administrative Boundaries (UTM projection), NAMRIA
 • Field Information, Manila, El Niño July 1997, BSWM
 • 1998 Philippine Statistical Yearbook, NSO
 • El Niño Definition, NOAA

Methodology
 • Degree of Vulnerability to El Niño is based on PAGASA's Climate Map, slope, flooding, and elevation

La Niña Vulnerability Map



Source :
 • Base Map with Administrative Boundaries (UTM projection), NAMRIA
 • Field Information, Manila, La Niña July 1997, BSWM
 • 1998 Philippine Statistical Yearbook, NSO
 • La Niña Definition, NOAA

Methodology
 • Degree of Vulnerability to La Niña is based on PAGASA's Climate Map, slope, flooding, and elevation

Users of Hazards Information

The NDCC, RDCCs, and MDCCs, as coordinators of disaster management activities in the country, are the prime users of the hazard maps. The maps are also distributed to the following:

- RDCs for their development planning activities
- DILG and LGUs for land use planning
- DPWH for infrastructure development and planning
- DENR for environmental and development regulations
- NHA and HLURB for housing and land development.

The private sector which includes housing and land developers, NGOs, and other government agencies may request for copies of the hazard maps.

2.2 Vulnerability and capacity assessments

The NGOs spearheaded the conduct of vulnerability and capacity assessments (VCA) in the Philippines (Heijmans and Victoria, 2001 and PNRG, 2002).

Community members with the guidance of NGOs and external experts undertake vulnerability assessments. The objectives are the determination of the elements at risk per hazard type and the analysis of the underlying reasons of risk. The assessment is guided by the following considerations (Heijmans and Victoria, 2001):

- Trends in the community which result in risks to food security and nutrition such as changes in land use, land tenure, water supply, production, demography, politics, and government policies
- Land use patterns, related problems, and risks
- Seasonal fluctuations like cropping systems, availability of food, periods of food shortage, dietary change, seasonal sources of income, livelihood security, food prices affecting food accessibility, food sources, change in farming practices, purpose of loans, migration patterns, and seasonal diseases.
- Production systems which encompass land tenure arrangements, fishing arrangements, techniques applied, inputs used, access to credits or loans, yield, post-harvest facilities and marketing
- Health, sanitation, and nutrition which include health conditions of the people, malnutrition rates, available health services, quality of water,

sanitation and hygiene practices, food beliefs/taboo/habits, preventive health measures, major diseases, mortality rates, and caring capacity

- Gender roles and responsibilities such as division of labor before, during, and after disasters, changes in gender roles over time, access and control to resources, services and benefits of production, and community roles and
- Social and organizational networks including profile of existing organizations, nature of relations, community-level decision-making mechanisms, participation, and fall-back structures in times of crisis.

A capacity assessment is undertaken to understand the people's previous experiences with hazards that enabled them to develop coping strategies. Likewise, available resources, e.g., material, organizational, and attitudinal, that the community uses to prepare for and mitigate the negative effects of the disaster are identified. After the capacities are listed and grouped, the following are discussed (*ibid.*):

- Which of the capacities are personal ones? Which are community ones?
- Are certain capacities particular to special individuals or groups of people in the community?
- Who controls access to these resource (individuals, women, men, PO, church, teachers)?
- Why don't some people have access to those resources? How could access be arranged in times of disaster?
- Are there any resources that are not used in emergency situations? How could they be utilized?
- What kind of coping strategies do people have to deal with crisis and the effects of disasters? How do they manage resources?
- How can coping strategies be strengthened in order to reduce vulnerabilities?

In cases where a people's organization (PO) exists, the evaluation of its organizational capacity is integral to the capacity assessment. The objective is to identify the organizational support needed so that the PO builds up its management capability to address the community's vulnerability. The following are discussed with the PO leaders and members (*ibid.*):

- What is the history of the PO? When was it formed and for what purpose?
- How is the membership? Attendance during meetings? Regular meetings?

- How are decisions made?
- Does the PO have a community development plan?
- How are the committees functioning?
- What did the PO contribute to the community so far?
- Conduct an organizational strengths, weaknesses, opportunities, and threats analysis
- Identify measures to address the weaknesses and threats, while using the strengths and opportunities.

The vulnerability and capacity assessments employ various tools such as historical profiling or time lining, spot mapping and hazard mapping, seasonal calendar, focused group discussion, key informant interview, height-age-weight measurements, and water testing (*Ibid.*).

2.3 Risk monitoring and risk mapping

Risk is viewed as a function of hazards and vulnerability. Given the current inadequacies of hazard assessment and VCA in the country, the estimation and representation of risk will not be possible for most prospective or actual disaster situations.

Under the EIS system, some environmentally critical projects such as dams and metal mines are required to have an ERA. One output of the ERA is a risk contour map. This map shows the individual risk of death at a specified location due to a hazardous event, *e.g.*, flooding from a dambreak. Together with the map is a risk management plan. However, the ERAs of development projects are usually not linked to the disaster management plan of the adjacent LDCCs. Thus, the community is either completely ignorant or misinformed about the risks of the project.

2.4 Post-disaster socio-economic and environmental impact and loss analysis

The implementing rules and regulations of PD 1566 require all concerned government agencies, in the aftermath of a disaster, to undertake a survey of damage within their scope of responsibility. The survey covers number of casualties, deaths, persons affected and losses to housing, crops, and public infrastructure. The damage assessment reports are prepared by the LDCCs and submitted to the RDCC and the NDCC. The latter collates the reports together with those prepared by various local and national government agencies. One final report is submitted to the President of the Philippines. This report

recommends whether a disaster condition should be declared and the funds that should be released by the national government in support of relief efforts.

Over the years, the government sought to improve the quality and coverage of damage assessments. This entailed training, improvement of reporting forms, and validation of damage estimates by the relevant department of the national government.

The damage assessments are captured in the database of the OCD. Accessible through the Internet, the disaster database has several limitations:

- For some disaster types, there are unusually long breaks in the reported incidents.
- Human casualties are not segregated in terms of gender and age.
- Only the direct costs of disasters are considered. Even then, not all direct costs are reported.

2.5 Early warning systems

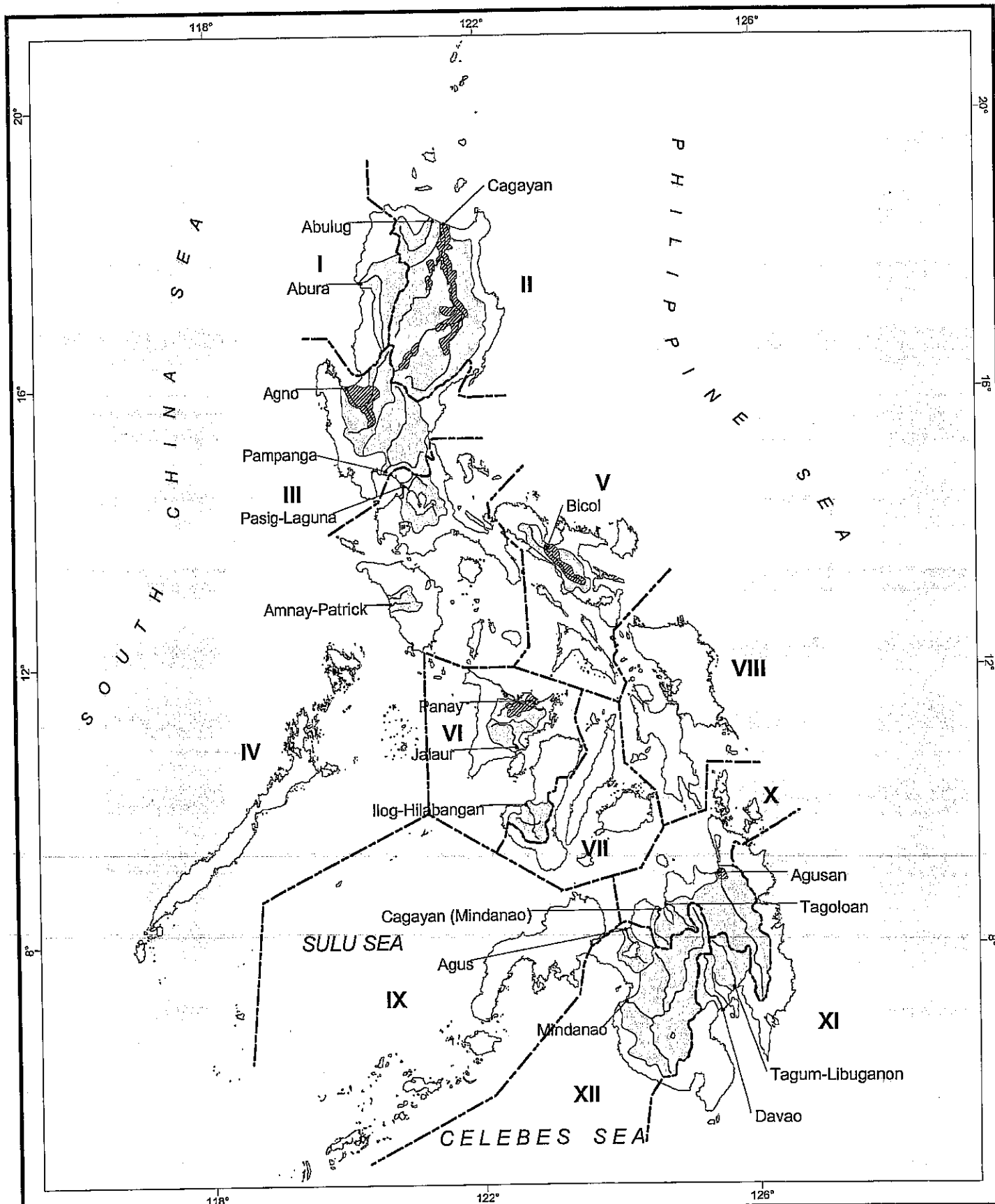
PHIVOLCS has 64 seismic stations and 6 volcano monitoring stations distributed all over the Philippines.

For weather monitoring and prediction, PAGASA has 44 synoptic stations and 5 data collection platforms. Based on the station readings, PAGASA generates a daily weather forecast and a shipping forecast twice a day. For developing tropical cyclones, a domestic bulletin is issued every 6 hours.

PAGASA maintains a telemetering multiplex system for flood forecasting and warning covering the Pampanga, Agno, Bicol, and Cagayan River basins (*Figure 13*). The NGOs, in their CBDMs, have installed rain gauges and flow monitors in some rivers.

The warning bulletins of PHIVOLCS, PAGASA, etc. are fed to radio and TV stations, newspapers, the Internet, LDCCs, DSWD's Disaster Response Operation Monitoring and Information Center (DROMIC), and NDCC. The DCCs receive, process, and rapidly disseminate the warnings to the threatened communities. Response units in the area are immediately notified.

During the activation of early warning systems, families are typically reluctant to abandon their homes. It has been found that a good prior dissemination of information on evacuation centers to the community helps facilitate the evacuation.



Map Projection:
Latitude - Longitude

0 50 100 150 200 Kilometers
GRAPHICAL SCALE

Source:
DPWH

- LEGEND :**
- Coastline
 - River Course
 - - - Water Resources Regional Boundary

**Major River Basins and
Water Resources Regions in the Philippines**

3 Knowledge Management

3.1 Disaster risk information management systems

Hazards information is collected by specific agencies and reduced into maps, reports, and if necessary, warning bulletins. The data generating agencies include PHIVOLCS, PAGASA, MGB, and Bureau of Soils and Water Management (BSWM), among others.

Hard copies of the maps and reports are provided to the actual and prospective users of the information. These include the NDCC, LDCCs, local governments, and national government agencies such as the DPWH, National Housing Authority (NHA), Housing Land Use Regulatory Board (HLURB), OCD, and Philippine Information Agency (PIA).

Private companies which include the proponents of development projects may buy the maps and reports from the agency concerned. Proponents of subdivisions, housing projects, and other land development projects go a step further. They prepare an EGGAR for submission to the MGB. As discussed earlier, the EGGAR allows the full consideration of geohazards in the siting and design of buildings and structures.

Some of the agencies like PHIVOLCS have budgets for public education and consultation. Occasionally, these budgets are supplemented by donor funds. For these cases, seminar-workshops are administered to the local officials and community leaders. The participants are made aware of the hazards and they are taught how to deal with them most effectively.

The warning bulletins are fed to radio and TV stations, newspapers, the internet, LDCCs, DSWD's DROMIC, and NDCC. The DCCs receive, process, and rapidly disseminate the warnings to the threatened communities and populations. Response units in the area are immediately notified.

DROMIC links DSWD's field offices and disaster intervention units and the LGUs 24 hours a day. The Center receives regular updates from PHILVOCS and PAGASA and it accordingly alerts regions that may be affected by disasters. Regular updates on the disaster situation (QUICK FACTS) are sent to the Office of the President, NDCC, other government officials, NGOs, media and other concerned organizations and individuals.

DROMIC maintains a data bank of disaster incidents and related information nationwide. Pertinent information includes the type of disaster, date of occurrence, affected areas (region, province, city/municipality, barangay), affected population (number of families and persons, ethnic origin), evacuation centers (number in operation and number closed), damaged houses (totally and partially), casualties (dead, injured, and missing), assistance extended by government (DSWD, LGUs, NGOs, private sector and individuals), number served, present needs of families and communities affected, and situationer on disaster (on-going or stopped, relief and rehabilitation efforts).

3.2 Linkage of academic and research communities to national or local institutions

Currently, academic and research communities have a very limited role in disaster risk reduction.

One major player is the Climate Studies Division (CSD) of the Manila Observatory. CSD aims to understand the complexity of climate mechanisms that are vital to the life of the nation and the Southeast Asian region. Its current research is centered on urban air quality and regional climate change.

For urban air quality, both field and modeling studies are being conducted to deepen the scientific understanding of pollutant transport and the urban modification of climate.

For regional climate studies, the scientific objective is to determine the local impact of varying climate regimes and the country's vulnerability to such impact. The nature and variability of these climate regimes such as the monsoon, El Niño-Southern Oscillation, and global warming are studied via observational analysis and modeling of the various physico-chemical and radiative processes that determine climate.

The research output in both urban air quality and regional climate change is closely linked with policy formulation. CSD has assisted the Philippine government to fulfill its commitment of submitting the first national communication to the UNFCCC by conducting the 1994 GHG inventory.

3.3 Educational programs in public school system

Disaster awareness is part of the learning core competencies under Science in public elementary and high schools. However, this is not extended to public colleges and universities.

PHIVOLCS supplements the public school program with its own earthquake awareness and drill program. In 1999, it prepared a brochure titled "Preparing School Children for Earthquakes". The material includes an earthquake drill to prepare teachers and students. It provides advice on where to seek shelter and how to protect oneself during an earthquake.

In November 2003, PHIVOLCS with the assistance of the UNDP held another school earthquake drill. The objectives of the exercise were to strengthen the capability of schools to conduct their own earthquake drill and to ensure the regular conduct of drills. The drill was done in two stages. The first drill was unannounced so teachers had to rely on their perceptions of how an earthquake drill was properly handled. The second drill was conducted based on the observations on the first drill. Thus, it was implemented more systematically than the first one. After the drills, school teachers and officials of the Department of

Education, NHA, and OCD met to discuss how the earthquake drill might be improved.

3.4 Training programmes

OCD is the leading trainer of LGU chief executives, deputized auxiliaries, volunteers, organic personnel, etc. Its training modules include:

- Contingency planning
- Emergency management training
- Specialized training on basic life support, collapsed structure search and rescue, disaster quick response, and medical first response and
- Emergency medical technician's basic course.

The Philippine Public Safety College provides public safety courses to policemen and firemen.

3.5 Traditional indigenous knowledge and wisdom

From 1996 to 1998, PHIVOLCS and UGAT conducted a study titled "Natural Disaster Management among Filipino Cultural Communities." The study noted several indigenous practices on disaster management. These included:

- Typhoon and flood forecasting techniques of the Ivatans and Cordillerans based on sky and cloud appearance, plant manifestations and unusual animal behavior and the Manobo and Subanen methods of using the stars and constellations to forecast heavy rains and droughts.
- Drought forecasting techniques of the Bagobos and Mandayas
- Monitoring of precursor signs of volcanic unrest by Tibilis and the identification of escape routes in case of eruption
- Construction of emergency shelters
- Preservation and stockpiling of food, fuel, and indigenous medicine in preparation for typhoons and floods
- Warning systems using indigenous devices
- Custom of collective self-help in responding to disasters and in carrying out recovery activities
- Drought coping mechanisms

- Aetas' community and agriculture rehabilitation after the Pinatubo Volcano 1991 eruption and ensuing lahars
- Selecting safe sites for settlements protected from strong winds, above the reach of floodwaters, and away from landslide-prone areas
- Rice terraces or hedgerows along hillsides to prevent or minimize landslides and erosion
- Tree belts to protect crops and houses from strong winds
- Adaptive agricultural cycle and cropping system
- Typhoon and earthquake-resistant houses and
- Ripraps along riverbanks for flood control and along slopes for erosion control.

Such practices have also been noted in communities undergoing a CBDM program. They are underscored and reinforced as part of the community's capacities.

3.6 National public awareness programmes or campaigns

Two laws have been enacted to heighten public awareness of disasters nationwide. The first one, Proclamation No. 296 of 1988, declares the first week of July every year as Natural Disaster Consciousness Week. The second one, Executive Order No. (EO) 137 of 1999, declares the month of July of every year as National Disaster Consciousness Month. This is to allow the national and local government agencies and the public to implement their disaster awareness campaign comprehensively with longer focus and well-coordinated fashion.

In July, each member-agency or sector of the NDCC organizes symposiums, workshops, drills, and other activities on disaster management. The mass media participate through the broadcast of audio or video clips on disasters. As noted previously, movie/TV plugs on earthquakes and cyclones preparedness have been prepared. Some media practitioners go as far as devoting their program exclusively to disasters and their management. The schools always get included as recipients of disaster awareness lectures and drills.

4 Risk Management Applications/Instruments

4.1 Good examples of environmental management linked with risk reduction

NA.

4.2 Financial instruments

The Philippines uses various financial instruments to reduce the impact of disasters. These include calamity funds, emergency reconstruction loans, and to a limited extent, insurance.

LGUs annually set aside 5 % of their estimated regular revenue as Local Calamity Fund (LCF). The LCF may be used for disaster relief, rehabilitation, reconstruction, and other works or services. Funds are released within 24 hours of the declaration of a disaster.

The National Calamity Fund (NCF) is established by the national government to supplement and complement the LCF. The NCF may be used, in decreasing order of priority, to fund emergency relief operations; emergency repair and rehabilitation of vital public infrastructures and lifelines; repair, rehabilitation and reconstruction of other damaged public infrastructures; pre-disaster activities outside the regular budgets of agencies; and capital expenditures for pre-disaster operation.

To finance the reconstruction of public infrastructures, the government taps the emergency reconstruction loans of the World Bank and the Asian Development Bank.

Insurance penetration for natural perils in the Philippines is very low. In 2000, the non-life insurance premium collected was USD 458 million, which amounts to only 0.6 percent of GDP. It is estimated that less than 10 % of all residential property policies cover natural perils. The total number of fire policies with endorsements for catastrophe perils is roughly less than 50,000. This is extremely low for a nation of 80 million people. Thus, the cost of natural disasters is borne largely by the government and homeowners (World Bank, 2004).

4.3 Specific examples of technical measures or programmes

MMEIRS

The MMEIRS is a two-year study, *i.e.*, from 2002 to 2004, funded by JICA with PHIVOLCS and MMDA as counterpart agencies. The study objectives are the

formulation of a master plan for earthquake impact reduction and the transfer of technology to the Philippine counterpart team. The study entails:

- Conduct of damage analysis using seismic microzonation methodology
- Application of comprehensive information technologies for the establishment of a basic database for Metro Manila
- Formulation of an earthquake disaster management plan that strengthens the vertical and horizontal synergy of inter-agency networks
- Formulation of a practical community-based disaster management plan and
- Emphasis on social and anthropological approaches to disaster management.

The MMEIRS is a good demonstration of the mapping of earthquake-related hazards such as ground shaking, liquefaction, and tsunamis in 500 m by 500 m grid. In the study, earthquake impact is broken down into building collapse, flammability, and evacuation difficulty. The vulnerability of each grid unit to the specified disaster impact is assessed. The vulnerability assessments are then integrated into a comprehensive vulnerability. A final integration into regional vulnerability shows more vulnerable areas with respect to evacuation difficulty.

The project engaged volunteers from the various communities. The volunteers were asked to assess their own strengths and weaknesses and to determine their capacity and what they need to do in case of an earthquake. Subsequently, based on a risk assessment, MMEIRS will generate a community-based disaster management plan

5 Preparedness and Contingency Planning

5.1 Disaster contingency plans

The preparation of disaster contingency plans for the local level was greatly facilitated by UNHCR's publication in 2003 of a manual for LGUs. This manual is titled "Contingency Planning for Emergencies."

Training of LGUs in the preparation of contingency plans started in Mindanao in 2001. Henceforth, training has covered all municipalities. A contingency plan has four major components. These are:

- General situation and scenarios – This briefly describes the various hazards affecting the community and their effects on lives and properties. Of the various hazards, the specific disaster event or threat to plan for is identified.



- General policies and objectives – The Section discusses the national, local and agreed policies and general objectives of the contingency plan.
- Sectoral plans and arrangements – This allocates responsibilities for command, control and coordination, registration, logistics and transport, environment sanitation, shelter and other infrastructure, security, search and rescue, fire suppression, emergency medical service, relief service, and evacuation service. The objectives, indicators, and resources of each sector as well as the flowchart of operations are spelled out.
- Procedures for feedback, upgrading and future action – This describes how the plan will be updated and revised, who will be responsible, and how the information will be disseminated.

The Municipal or City Mayor as Chairman of the LDCC is responsible for activating the contingency plan.

The efficacy of a contingency plan to save lives and properties during actual disasters depends on a host of factors. This includes the quality and adequacy of inputs to the plan which determine among others the accuracy of the “worst case” being planned for, the knowledge and competence of the responsible sectors and the community which can only be honed by training and drills, and the resources at the disposal of the plan implementers.

During the landslides of December 2003, certain lapses in the plan and plan implementation were apparent. The communities were not prepared for a landslide; there was no early warning and response mechanism in place; the DOH was not part of the contingency plan; there were coordination problems between national and local government agencies (UNDMT, 2004).

5.2 Emergency funds and storage facilities

LGUs set aside 5 % of their estimated regular revenue as Local Calamity Fund (LCF). LCF is the annual lump sum appropriation for disaster relief, rehabilitation, reconstruction, and other works or services. Funds are released within 24 hours of the declaration of a disaster.

The national government sets up annually a National Calamity Fund (NCF) to supplement and complement the LCF. The priority of use in decreasing order is for urgent and emergency relief operations and emergency repair and rehabilitation of vital public infrastructures and lifelines; repair, rehabilitation and reconstruction of other damaged public infrastructures; pre-disaster activities outside the regular budgets of agencies; and capital expenditures for pre-disaster operation.

Part of the NCF is allocated as Quick Response Fund (QRF). QRF is a rapid stand-by fund for use in the immediate aftermath of a disaster. It is pre-allocated to the DSWD, OCD, DPWH, and DND.

5.3 Coordination of disaster response preparedness

Local disaster coordinating councils (LDCCs) are organized at the regional, provincial, city, municipal, and barangay levels (the smallest political unit). As shown in *Figure 3*, the organization of LDCCs are similar to that of the NDCC. Its members are the heads of the regional, provincial, or municipal offices and field stations of the NDCC member-agencies.

The RDCC is chaired by the PNP Regional Director. The PDCC, CDCC, MDCC, and BDCC are chaired by the Provincial Governor, City Mayor, Municipal Mayor, and Barangay Captain, respectively.

The functions of LDCCs include the following:

- Establishment of a Disaster Operations Center
- Coordination of disaster operations and activities in the area
- Implementation of guidelines set by the NDCC
- Provision of advice to lower LDCCs on disaster management
- Submission of recommendations or reports to the NDCC as required.

Various services are attached to the LDCCs:

1. The *warning service* educates the residents on the meaning of different warning signals and the different actions to be taken if such signals are given. Warning services are organized and members are assigned to a specific block in the barangay. Warning devices such as horns, lights, sirens, bells, etc. are maintained and operated when needed.
2. The *rescue service* is responsible for locating injured, trapped, and stranded persons and moving them to a place of safety.
3. The *evacuation service* supervises and expedites the planned and controlled movement of all residents during an emergency.
4. The *disaster relief service* is responsible for the needs of evacuees and victims including housing for displaced persons in evacuation centers or in private homes.
5. The *medical service* is responsible for training, equipping, and supervising all personnel assigned to perform medical or first aid services.
6. The *fire brigade* provides fire-fighting facilities and assures that firefighters know their station, the location of fire fighting equipment, and alarm signals.



7. The *damage control* service controls utilities in the community during an emergency. Its components are the *security service* which is responsible for protecting persons and properties in vacated houses or evacuation centers, responding to alarm signals and suspicious activities or reported unusual activities, and performing escort duties in the transport of persons, supplies, and equipment; *supply service* which is responsible for determining the supply requirement; *transportation service* which handles the transport needs of the council; and the *communication service* which receives warning information from local OCD authorities for dissemination to the barangays.

The disaster response preparedness activities of the PDCCs down to the MDCCs are funded from the 20 % development fund of the local government. However, such activities are not mandatory but left to the discretion of the local chief executive. Rich provinces, cities, and municipalities will not have problems in undertaking preparedness activities.

6 Call for Good Practices in Disaster Risk Management

Community-Based Disaster Management

The NGOs are at the forefront of community-based disaster management (CBDM) in the Philippines. Tracing its roots to the Marcos dictatorship (1972 to 1986), the approach veers away from the traditional institution-based delivery system that is non-participative, top-down, externally dependent, and non-empowering (Luna, 2004).

In 1987, the Citizens Disaster Response Center and its partners that comprise the Citizens Disaster Response Network launched an alternative form of disaster management called the Citizenry-Based and Development-Oriented Disaster Response (CBDO-DR). Its objective is to contribute to pro-people development for the general improvement of the well-being and quality of life for the majority of Filipinos. It has six distinguishing features, namely (Heijmans and Victoria, 2001):

1. CBDO-DR looks at disasters as a question of vulnerability.
2. It recognizes people's existing capacities and aims to strengthen this.
3. It contributes to addressing the roots of vulnerabilities and to transforming or removing the structures generating inequity and underdevelopment.
4. It considers people's participation essential to disaster management.
5. It puts a premium on the organizational capacity of the vulnerable sectors through the formation of grassroots disaster response organization.
6. It mobilizes the less vulnerable sectors into partnerships with the vulnerable sectors in disaster management and development work.

The CBDO-DR was effective in terms of the following (*Ibid.*):

- Decrease in loss of lives and property after preparedness and mitigation measures are put up.
- More timely and better quality relief assistance that are in accordance to their needs.
- Lower cost of relief assistance compared to unorganized communities where a higher input of external human and financial resources is required.
- Better-facilitated implementation of relief operations through the partnership between the vulnerable and the less vulnerable.

In 1994, the Philippine National Red Cross (PNRC) shifted its focus from emergency response to community-based disaster preparedness by piloting a program titled Integrated Community Disaster Planning Programme (ICDPP). This is consistent with the International Federation of Red Cross and Red Crescent's shift worldwide from disaster response to disaster management. The ICDPP has the following features:

- It is integrated as the program relates to a broad range of local problems made worse by natural hazards and disasters.
- It is multi-sectoral where people from different organizations at the community level are engaged as volunteers.
- It is multi-disciplinary as the program establishes collaboration among many different line agencies of the government.

Based on the experience and outcome of the ICDPP, the PNRC documented the following program benefits (Luna and Knud, 2003):

- The effects of hazards in the community are mitigated.
- The disaster action team continues to do its functions and its membership is increasing.
- Community residents are involved in community activities.
- Local officials are supportive of the team by integrating the disaster action plan in the community development plan.
- Budget is allocated by the local council for CBDM-related projects and activities.
- Community leaders are able to tap resources for their community projects.

- The community is able to manage the disaster situation in the community through search and rescue, relief distribution, evacuation, and assisting in the provision of medical and psychosocial services.
- The people have a positive attitude towards the NGO.

The government recognizes the value of CBDM. In 2003, the NDCC, National Defense College of the Philippines, and the Philippine Disaster Management Forum, a network of disaster management NGOs, jointly sponsored the First National Conference on Community-Based Disaster Management. Attended by 62 delegates from the government, NGO, and POs, the conference showcased good practices in CBDM.

City of Marikina

The City of Marikina is located along a valley in the eastern part of Metro Manila. With a total land area of 21.5 sq km, twelve of its fourteen barangays lie along the Marikina River.

In 1992, Marikina faced major environmental problems. These included limited garbage collection, dumping of waste on open land and waterways, informal riverbank settlements, and a clogged drainage system. In 1993, the city government launched the "Save the Marikina River" program. Commercial buildings and informal settlers were removed from the easements. One hundred nine hectares of land and a community mortgage program was provided for the resettlement of 10,500 families. A strict garbage collection policy was also introduced. In addition, the city government undertook by itself river dredging which was a national government responsibility.

The program has been hugely successful. Areas prone to flooding have been significantly reduced from 20 % to 5 %. Floodwaters recede much faster now. Property values have risen around ten-fold in areas previously prone to flooding. Squatters along the riverbanks are gone. Recreational activities have replaced the slaughterhouses and other industries along the side of the river. Marikina has been judged as the cleanest city in the country.

Municipality of Guagua, Pampanga

The municipality of Guagua is located in the central province of Pampanga. In 1998, the local business community met with the municipal mayor to discuss the flood that began to affect the central business district. Consequently, the mayor called for municipal-wide meetings and consultations.

In 1991, while lobbying with the national government agencies for the implementation of flood mitigation measures formulated by the community, Pinatubo Volcano erupted. Around 10 billion cu m of pyroclastics and ash were deposited at the slopes of the Pinatubo mountain range. In the succeeding years, these deposits would mix with the surface runoff from typhoons and

monsoon rains to form lahar. The result was the burial of villages, river channels, and tributaries.

The lahars galvanized the community to undertake on their own with minimal support from the external organizations disaster preparedness and mitigation activities. Three things make the Guagua experience stand out. First, it contrasts with the experience of other municipalities within the province which were supported generously by external local and international donor agencies. Second, community support came from a truly wide spectrum of the population, *i.e.*, academe, religious organizations, women's groups, public transport drivers and operators' associations, market vendors, and local business organizations. Third, the participatory planning and implementation processes were institutionalized into the local government bureaucracy. This was accomplished through the creation of a local multi-sectoral development council that met regularly to discuss the development plans, programs, and finances of the local government. The council went beyond disaster management concerns to cover the entire socio-economic development agenda of Guagua.

The leaders of the major community groups were asked on the reasons for their participation in the municipality's disaster management efforts. The reasons they cited were:

- The extent of the problem exceeded the coping capacity of the government coupled with the fear that disasters would affect them
- Close ties with neighbors due to religious and socio-cultural customs and traits
- A visible and highly credible local chief executive
- Clearly defined mechanism and process where they are able to voice out their opinions and sentiments on local development plans
- Access to timely and accurate information on disaster situations and the current state of affairs of the local government
- Transparency of the local government and
- A relationship based on trust developed as a result of working together in previous activities and projects.

7 Priorities for discussion at World Conference on Disaster Reduction

The Philippines proposes two items for discussion at the forthcoming World Conference on Disaster Reduction. These are:

1. Support of international donor agencies to disaster risk reduction initiatives and

2. Enhanced flow of disaster risk reduction information to developing countries.

Donor support to disaster risk reduction

The shift in focus of disaster management to the reduction of disaster risk starting in the late eighties with the UN's declaration of the International Decade for Natural Disaster Reduction is most welcome. This shift culminated with the adoption of the Yokohama Strategy and Plan of Action for a Safer World at the 1994 World Conference on Natural Disaster Reduction.

However, as noted by the IFRC in its World Disasters Report 2002, there are barriers to disaster risk reduction. These include geopolitics, absence of coherent risk reduction "community", non-maintreaming of risk reduction into development and humanitarian programming, perception that risk reduction is a technical problem with technical solutions, lack of donor assistance, and invisibility of risk reduction spending.

With the assistance of the UNDP and the World Bank, the Philippines is moving to establish a holistic framework for disaster and environmental hazards management. This framework is anchored on disaster risk reduction. A draft Project Document to support this framework has been prepared and is being subjected to public consultation and review. The major components are:

- Legislative support for a new disaster management law
- Strengthening of interdisciplinary and intersectoral partnerships
- Development of disaster risk indexing system
- Integration of disaster management in physical, social, environmental, and economic development planning
- Increased transparency and accountability for disaster management funds
- Comprehensive and standard methodologies for the assessment of disaster losses
- Development of risk transfer mechanisms
- Strengthening of spatial partnerships
- Expanded implementation of CBDM programs
- Development of a national disaster management strategy.



As may be inferred from the components, the project will institutionalize disaster risk reduction in the country. However, for this to succeed, donor support is critical.

It is hoped that during the forthcoming conference, some stocktaking and a strong urgent appeal for international donor agencies to focus their support to disaster risk reduction initiatives be made.

Disaster risk reduction information support to developing countries

The reduction of disaster risk relies heavily on the availability of accurate and updated information. Unfortunately, poor disaster-prone countries are unable to access the information. It is either because the countries are ignorant of the information or the information is too costly.

An international body may act as a clearing house for disaster risk reduction information. Its objective is to take stock of information resources currently available worldwide, identify which information is critical, and make the information available in the country where it is most needed.



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