

## **9.2.4 Angat Dam**

### **1) Location**

The Angat dam is located in San Lorenzo, Norzagaray, Bulacan, about 60 kilometers north of Metropolitan Manila (Figure 9.2.7). The Angat dam collects the flow of the Angat River, which passes through the western flank of the Sierra Mountain Range. Plan view of the dam is shown in Figure 9.2.8.

### **2) Function**

Construction work of the Angat dam started in 1961, and the dam was completed in 1967.

The Angat dam is multi-purpose dam. The function/concept is as follows.

- Power: The generation of electricity is 246,000 KW. It is required for the Luzon Grid.
- Irrigation: The reservoir water provides irrigation water to some 30,000 hectares of rice land in Bulacan.
- Flood control: The reservoir helps minimize flood destruction.
- Tourism: The dam site is now a tourist attraction, because of its scenic landscape.
- Water supply: The Angat dam supplies 935 million gallons of water a day to water-deficient areas. These include the Metropolitan Manila and 18 municipalities within the MWSS franchise area. Metropolitan Manila is supplied water from the La Mesa dam which gets its supply via the Ipo dam (see Figure 9.2.9).

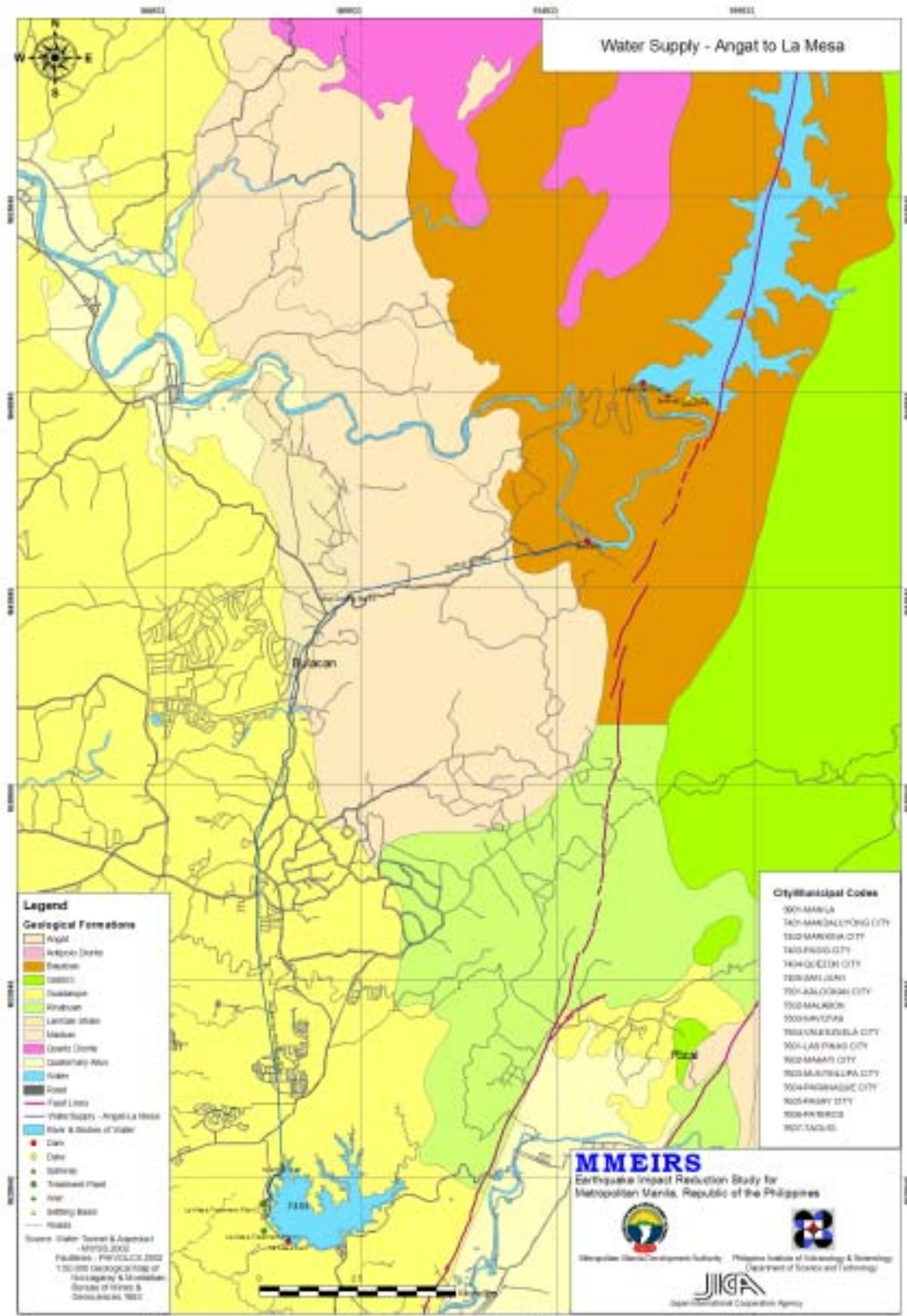


Figure 9.2.7 Geological Map around the Angat Dam and Water Transmission Pipes

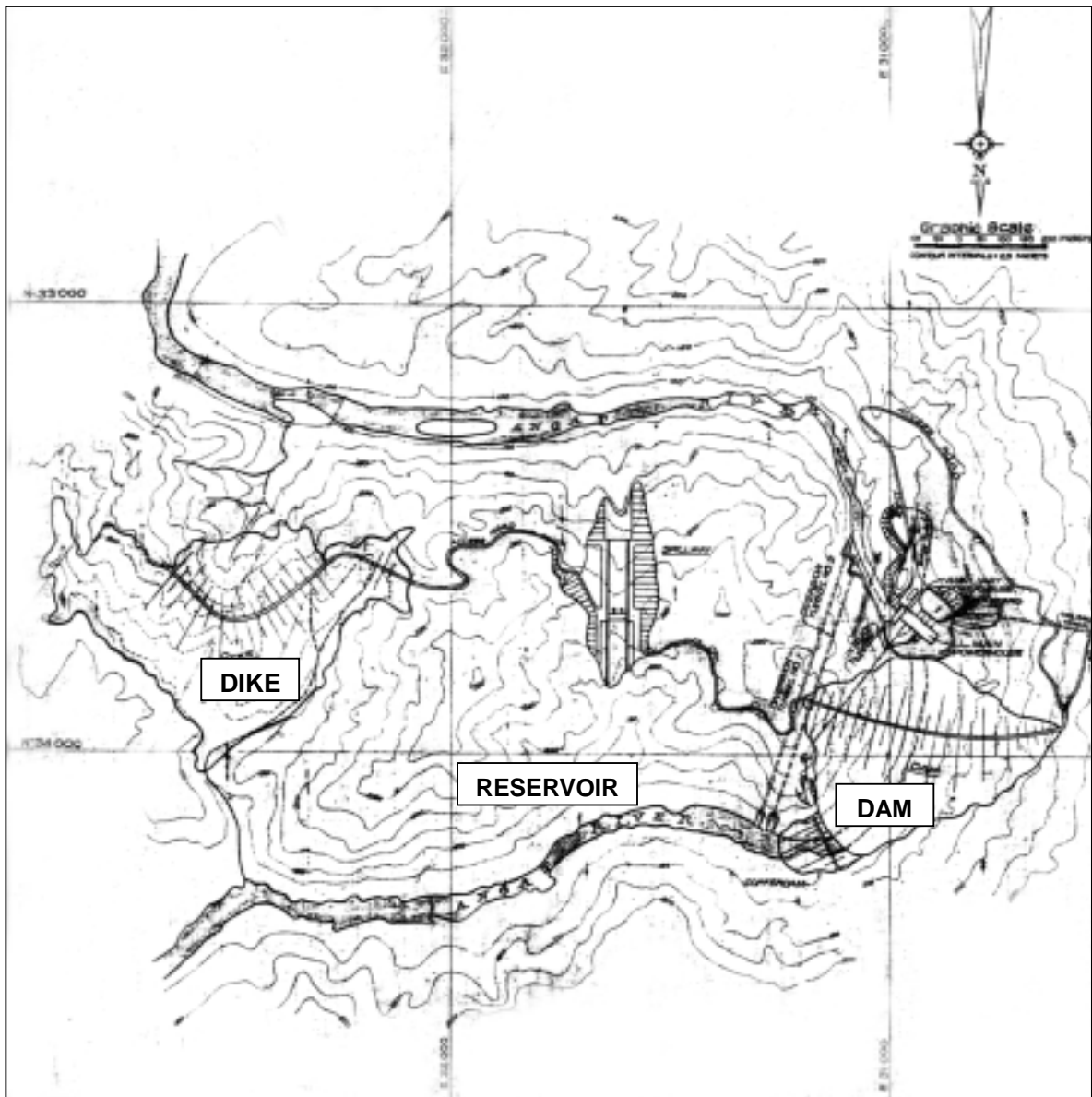


Figure 9.2.8 Plan of the Angat Dam and the Dike

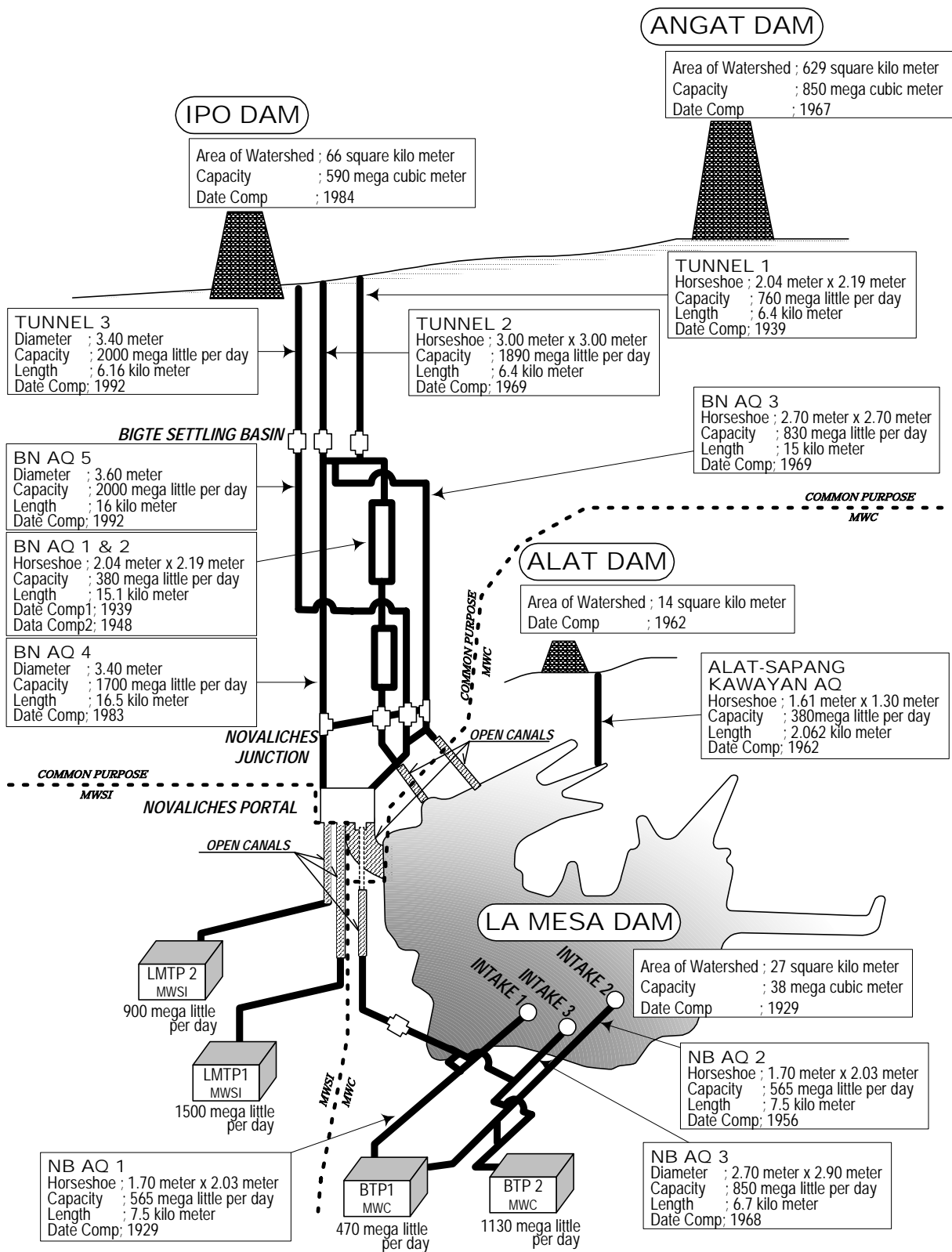


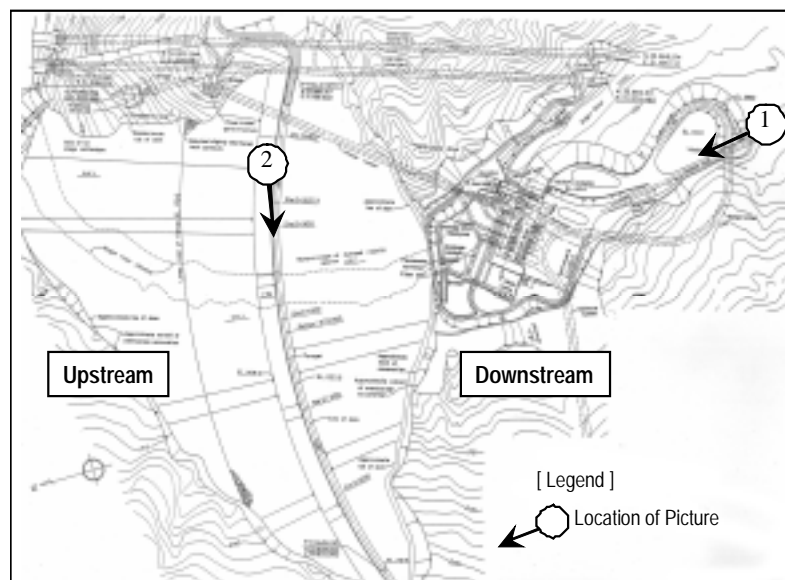
Figure 9.2.9 MWSS Headworks Schematic Diagram

Source ; MWSS

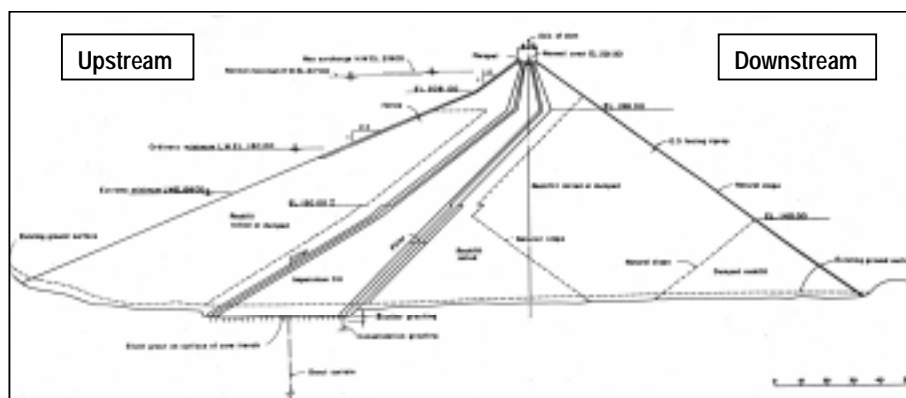
### 3) Structure

Structure of the Angat dam is as follows.

- Maximum Height ----- 131 meter
- Length at Crest ----- 568 meter
- Widest Section ----- 550 meter
- Type of Dam ----- Earth and Rockfill Dam
- Type of Impervious Core ----- Inclined Earth
- Capacity ----- 850 mega cubic meter
- Elevation at Crest (Middle) ----- Elev. 223.5 meter
- Elevation at Crest (Abutment) ----- Elev. 221.5 meter
- Upstream Slope ----- 1 on 2.5
- Downstream Slope ----- 1 on 1.35
- Quantities of Fill
  - a) Impervious Fill Earth Core ---- 880,000 cubic meter
  - b) Rockfill ----- 5,725,000 cubic meter
  - c) Filters ----- 464,000 cubic meter



**Figure 9.2.10 Plane of the Angat Dam**



**Figure 9.2.11 Cross Section of the Angat Dam**



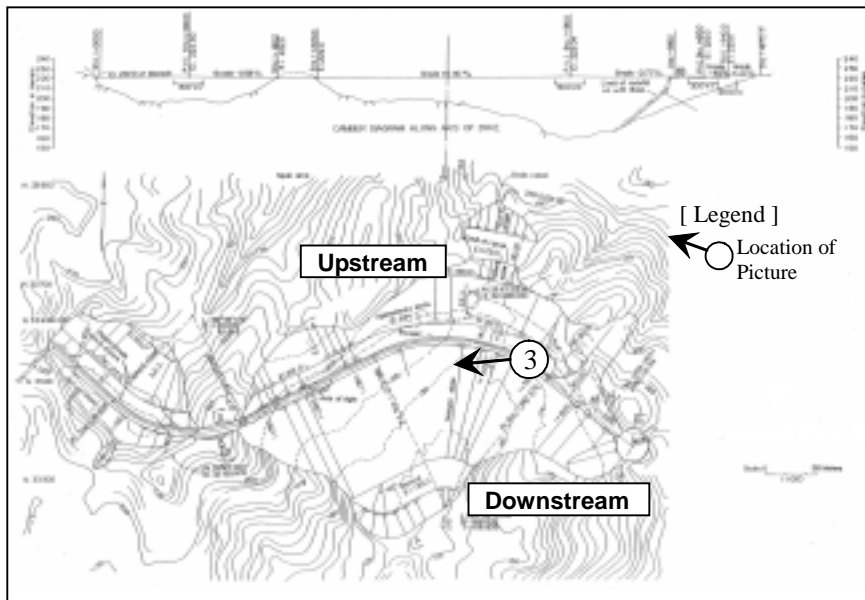
**Picture 1. Angat dam from downstream**



**Picture 2. Dam View from crest,**

Structure of the dike is as follows.

- Maximum Height ----- 52 meter
- Type of Dam ----- Earth and Rockfill Dam
- Type of Impervious Core ----- Inclined Earth
- Upstream Slope ----- 1 on 2.2
- Downstream Slope ----- 1 on 1.45
- Quantities of Fill
  - a) Impervious Fill Earth Core ----- 114,200 cubic meters
  - b) Rockfill ----- 1,090,000 cubic meters
  - c) Filters ----- 127,500 cubic meter



**Figure 9.2.12 Plan of the Dike**

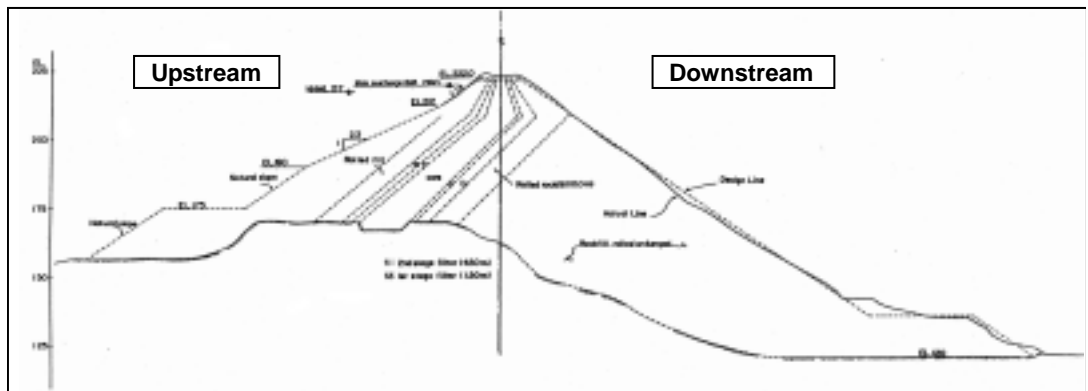


Figure 9.2.13 Cross Section of the Dike



Picture 3. Dike view from crest

### 9.3 Lifelines

Role of Lifeline is indispensable from human in the daily life, and importance to maintain without cutting off the supply is very much necessary. Therefore, analyzing damage to Lifeline is important to recover from the damage against earthquake events. Lifelines consist of the following 3 aspects in the study.

- 1) Water
- 2) Electricity
- 3) Telecommunications

Types of lifelines examined in the Study are shown in Table 9.3.1. Data sources are also shown in the table. Summary of pipe length and cable length are shown in Table 9.3.2.

**Table 9.3.1 Contents of Lifeline Facilities**

Contents	Data Source
Water Supply Pipe Network for Metropolitan Manila	MWSS, Manila Water, Maynilad (2003/1997)
Water Supply Pipe Network Angat to La Mesa	MWSS (2003)
Water Supply Facilities Angat to La Mesa	MWSS (2003)
MERALCO Substations in Metropolitan Manila	MERALCO (2003)
MERALCO Power lines in Metropolitan Manila	MERALCO (2003)
Napocor Substations in Metropolitan Manila	NPC (2003)
Napocor Power lines in Metropolitan Manila	NPC (2003)
PLDT Telephone Exchange Building Locations	PLDT (2003)
PLDT Telephone Exchange Boundaries	PLDT (2003)
PLDT Telephone Primary Cables	PLDT (2003)

**Table 9.3.2 Lifeline Facilities in Metropolitan Manila**

Type of Facility	Total Length	
Water Supply Pipe	4,613,985 m	
Electric Power Supply Cable	230KV	32,486 m
	115KV	307,823 m
	34.5KV	4,521,399 m
	Total	4,861,708 m
Telephone Line	Aerial Cable	9,445,177 m
	Underground Cable	3,906,453 m
	Total	13,351,630 m

#### 9.3.1 Water

Damages to the structure caused by earthquakes are divided into two, one is direct cause from seismic motion, and other is ground displacement caused by ground failure or fissures. In any case, there was many damages found in the water distribution facilities in the past earthquakes in the world, especially, in pipe networks, many damages were found, which was directly cause effect of ground displacement.



Malfunction or of water distribution system triggered by earthquakes cause cut off or minimize water supply, and especially, if purification plants, pumping stations, and major pipes are heavily damaged, areas where the water supply is cut off will be large. Moreover, water main pipes, conduit pipes, and water reservoirs, which treat large volume of water, are damaged, it may create road sank or water drench of houses caused by water flow out, and may cause accidents resulting in injury or death, which can be considered as secondary disaster. Furthermore, if distribution pipes are damaged, from the damaged points, contaminants inflow to the pipes may cause water pollution.

On the other hand, at the time of earthquake, not only damage to the water distribution facilities, but also to the other lifeline can be considered. For instance, even if there are no damages to the water facilities, damage to electricity distribution facilities may cause stop of electric supply to pumping stations, and it create serious malfunction of water distribution. Especially in the urban area, effect will be bigger since pumping system is used rather than natural flow system in the flat area.

In Metropolitan Manila, for the distribution of Water and Sewage service, MWSS is a government organization under control of two concessions, 1) Maynilad, and 2) Manila Water. These two companies are serving all over the Metropolitan Manila.

Water distribution in Metropolitan Manila is only rely on Angat Dam located far North of Metropolitan Manila. And once raw transmission pipe is damaged, serious water distribution stop can be considered.

### **9.3.2 Electricity**

Regarding electricity supply system, for distributing the products “Electricity” having special characteristics, electricity cannot stably supply, when only connects from supplying side to demanding side physically. Generally, to supply electricity stably, Ability of “Adequacy” and “Security” are demanded. “Adequacy” means supplying ability of electricity demanded by subscribers within the value of electric current and voltage which allow system composition. “Security” means ability to sustain system composition from unexpected sudden accidents. Namely, to sustain connectivity from supplying side to demanding side physically, it is only a necessary condition to supply electricity, and to satisfy a sufficient condition, it is very much necessary to consider the characteristics of electricity mentioned above.

On the other hand, in actual system, in case if structural damages occurred to electricity supply facilities caused by earthquake, problems, which often occurs, are;

Abnormality of system frequency (disagreement between electricity supply and load)

Abnormality of voltage (abnormal up and down of voltage)

Over load (flow of electric current exceeding maximum current of transmission lines)

In such electricity supply system, correlation between structural damages and functional damages can not be determined with only one principal, and it is very much differs by initial conditions such as maintaining ability of function electricity, characteristics and system itself has.

### **9.3.3 Telecommunications**

In telecommunications network, there are two types of damage can be observed in the past earthquakes. One is direct damage from seismic motion, and another is ground displacement caused by liquefaction, ground failure.

Regarding characteristics of telecommunication network system, since system itself distributes wide area as network, only partly damage to structure, even with small scale earthquakes, can cause malfunction of the part or all of system, and this malfunction effect greatly in citizen's life and urban activities.

Compare to the other lifeline, effects to citizen's life is less, since it will not create direct damage to human's life. However, without telecommunication, smooth rescue operation and other important activities cannot be operated, therefore, maintaining safe network without cutting off are very much necessary.

In Metropolitan Manila, 9 companies controlled by governmental organization called National Telecommunications Committee (NTC) are operating telecommunication services. Coordination and information sharing among telecommunication companies is necessary lead by NTC.

## 9.4 Hazardous Facilities

Types of hazardous facilities examined in the Study are shown in Table 9.4.1. Data sources are shown in the table. The number of facilities in each LGU is summarized in

Table 9.4.2. Location maps are shown in Figure 9.4.1 to Figure 9.4.2.

**Table 9.4.1 Contents of Hazardous Facilities**

Contents	Data Source
Gas Station Locations	MMEIRS (2003)
Fire and Explosion Hazard Facilities & Locations, such as Gas Tank, LPG Refilling and other fire prone areas	BFP (2003)
Fire Prone Areas	BFP (2003)
Hazardous Waste Treatment Facilities	DENR-EMB (2003)
Hazardous Waste Generating Facilities	DENR-EMB (2003)
Hazardous Stock - Radioactive Material	MMDA (2003)
DENR Administrative Sections in Metropolitan Manila	DENR-EMB (2003)

**Table 9.4.2 Hazardous Materials Treatment Facilities in Metropolitan Manila**

LGU Code	LGU	Hazardous Materials Treatment Facilities					Total
		Hazardous Facilities	Gas Stations	Radioactive Material	Treatment Facility	Generating Facility	
390	Manila	7	72	18	1	55	153
741	Mandaluyong	0	8	2	0	11	21
742	Marikina	0	14	3	1	3	21
743	Pasig	0	33	6	1	23	63
744	Quezon	5	126	29	0	21	181
745	San Juan	0	16	5	1	3	25
751	Valenzuela	7	25	3	1	6	42
752	Kalookan	0	30	1	1	0	32
753	Malabon	3	17	0	0	2	22
754	Navotas	9	6	1	0	0	16
761	Las Pinas	0	14	0	3	3	20
762	Makati	0	13	14	0	14	41
763	Muntinlupa	0	16	5	0	7	28
764	Paranaque	2	30	2	1	5	40
765	Pasay	4	20	0	0	4	28
766	Pateros	0	8	1	0	0	9
767	Taguig	0	8	5	0	4	17
Total		37	456	95	10	161	759



Figure 9.4.1 Location Map of Fire/Explosion Material treatment facilities, Gasoline Stations

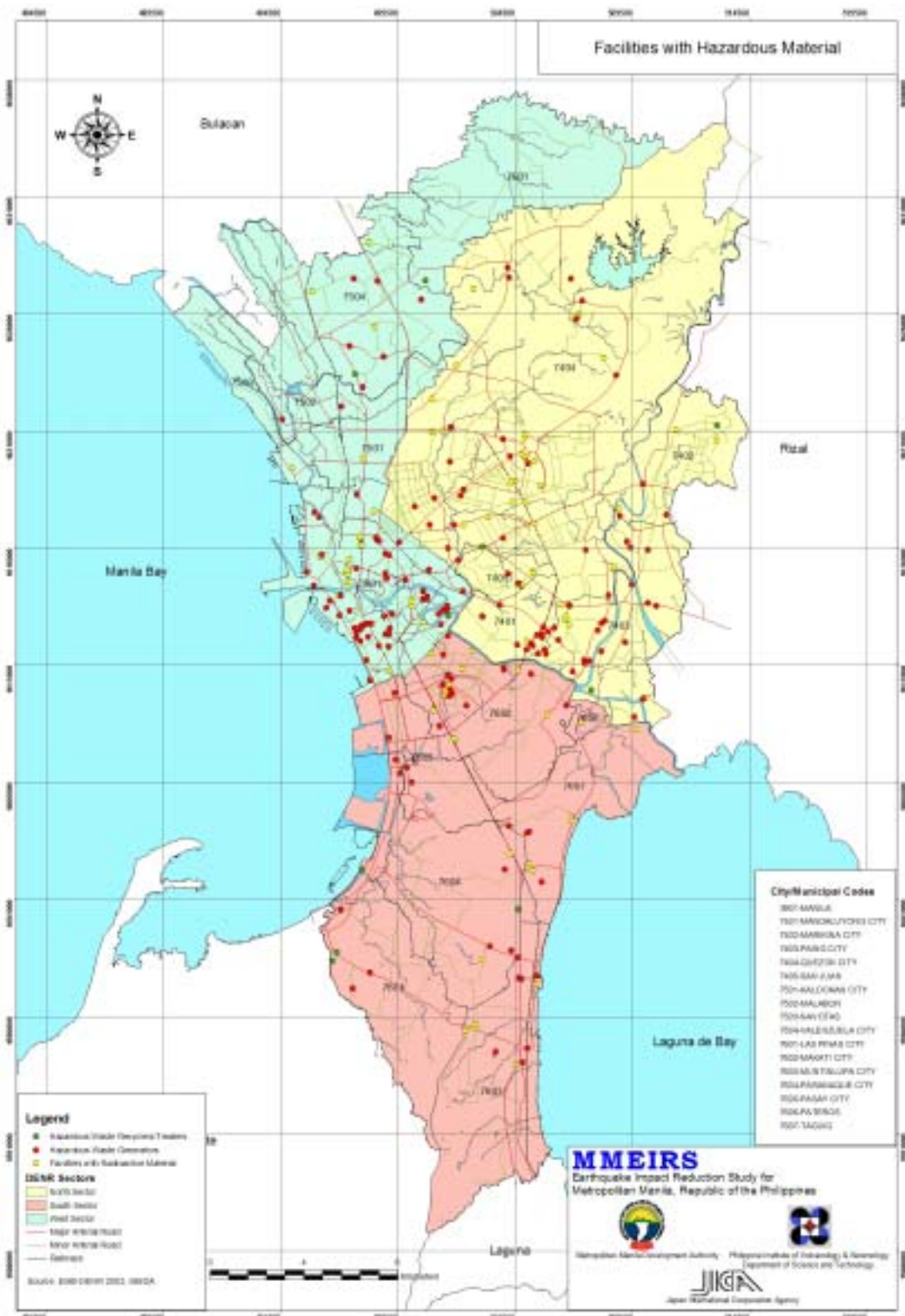


Figure 9.4.2 Location Map of Hazardous Waste Treatment Facilities, Hazardous Waste Generating Facilities, Hazardous Stock - Radioactive Material

**1) Objectives**

When hazardous materials, such as the deadly and poisonous substance, radioactive material, combustible liquid, combustible solid, and combustible gas facilities are shaken by earthquake, those substances may leak or scatter, and could cause to the secondary disaster, like explosion, fire, and other disasters. Therefore, earthquake disaster measure for different types of establishments, such as manufacturing plants, or hazardous materials storage, is very important when considering about city safety. Conditions of earthquake-proof measures at these hazardous material storage and handling facilities are necessary to be investigated.

**2) Contents of Investigation**

This survey was implemented on about 95 facilities and houses, 30 of which are storage and manufacturing facilities for hazardous material. Those facilities and buildings are all existing in 13 cities and municipalities in the Study area. Contents and location of the investigation is summarized in Table 9.4.3, and Table 9.4.4.

**Table 9.4.3 Contents of Investigation on Hazardous Facilities**

Establishments	No of Establishment	No of Facilities
Business Establishments	20	84
1. Petroleum Storage or Handling Facility	9	46
2. The LPG and High-pressure Gas Storage or Handling Facility	6	14
3. The Deadly and Poison Substance or Material Handling Facility	1	13
4. The Radioactive Material Handling Facility	1	3
5. The Small Amount of Hazardous Material Handling Facility	3	8
Private Houses	11	11
Total	30	95

**Table 9.4.4 Location of Investigation on Hazardous Facilities**

Cities/ Municipalities	Petro.E	LPG.E	Poison.E	Radioa.E	Small.E	P.House
City of Manila	X				X	X
Navotas		X				
Quezon City		X		X	X	X
Las Piñas city			X			X
Makati City						X
Muntinlupa City	X	X				
Parañaque City						X
Pasay City		X			X	
Mandaluyong City						X
Pasig City		X				X
Pateros City	X					
San Juan City	X					
Taguig	X					

Petro.E : The Petroleum Storage or Handling Establishments

LPG.E : The LPG and High-pressure Gas Storage Handling Establishments

Poison.E : The Deadly and Poison Substance or Material Handling Establishments

Radioa.E : The Radioactive Material Handling Establishments

Small.E : The Small Amount of Hazardous Material Handling Establishments

P.House : Private House

### 3) Investigation Items

Items for investigation are mainly as follows;

- Earthquake-proof Measures on Buildings, Tanks and Cylinders
- Measures against the Danger on Hazardous Materials Leakage and the Non-proliferation of Leakage
- Fire Prevention Measures
- State of Fire Protection Equipment of Establishments
- Plan for Protection against Disasters and the Implementation of Training
- Emergency Stockpiles

### 4) General Understandings

Results of investigation are now under compilation. General understandings are summarized as below.

In relation to the danger of the establishments, tentative fire measures has been adopted in the investigated facilities and houses, however, many places were found still incomplete with necessary measures for earthquake disaster.

For example, in Metropolitan Manila, LPG gas is mainly used in the residential area. Cylinder for LPG gas is placed inside the residential houses, connected by the tube. Also, there are very few places where using city gas within the study area. In either cases, since those substances are one of the main hazardous materials which could expand the disaster, therefore, preparation of

appropriate measures on the occurrence of earthquake in which case fire prevention measure is very important.

Studying the past records on secondary disaster caused by fire, for Kanto Earthquake of 1923, several aftershocks after the main shake caused the fire breakout from the cooking stove made high. Looking after Fukui earthquake in the 1960's, it was observed that the fire breakout rate was very much depended on gas and condition of petroleum equipment. Summarizing the past earthquake with high fire outbreaks, for the 30 years span, from 1968 Tokachi earthquake and 1995 Kobe Earthquake, 8 of them were mainly caused by the electricity, gas, and petroleum.

In 1995 Kobe earthquake, causes for fire breakout was mainly the city gas and LPG. Each of them was observed with 20 and 3 cases. Though, fire breakout caused by LPG is related to city gas, since all of them are located in the city gas installed area. On the contrary, for the Mexico Earthquake in 1985, causes for the fire breakout was mainly from the LPG.

As the conclusion, introduction and wide spreading of fire protection measures and leakage protection measures for hazardous materials are indispensable for reducing secondary impact.

#### **Acknowledgements**

The investigation work on hazardous materials was conducted under close support from Bureau of Fire Protection, one of Technical Working Group member. The Study Team expresses special thanks for their collaboration, especially to Mr. Edibert C. Flormata, Chief Inspector, Sr. Supt Rash C. Roque, NCR Regional Fire Marshal, and other inspectors concerned to the work.

#### **5) Fire Code**

Fire Code of the Philippines and Regulations was enacted as P.D. NO.1185 on August 26 1977. This P.D. NO.1185, includes fire service law, cabinet order, and regulations. This law is comprised of Part 1 and Part 2.

Part 1 is titled "PRESIDENTIAL DECREE entitles 1185" and separate into 17 items. Part 1 begins from "Title" to "Effectively" for prescription, and used as general rule. This part is about THE FIRE CODE OF THE PHILIPPINES AND REGULATIONS, and includes articles from Section 1 to Section 17.

For example, there is a section, which states "WHEREAS, death and injury to persons and loss and damage to property by fire have reached alarming projection that the economic and social gains of the society are being continually undermined". This is stated under "Declaration of Policies, Duct System, Fire Alarm, Fire Door.". This section prescribes the fireproofing measures purpose, the fireproofing education. As necessary, it provides the fire prevention measure, according to each subject.



Part 2 is entitled “Implementation and Regulations “. It comprises with RULE 1 (General Provision) to RULE 43 (Administrative Course). The GENERAL PROVISIONS in RULE 1 are prescribing about the fire prevention measures according to each of the objected buildings, as following examples.

All people,

All private or public buildings, facilities, structures and their premises constructed before of after the effectively hereof,

Design and installation of electrical system,

Storage handling or use of explosives and/or combustible, flammable, toxic and other hazardous materials,

Fire safety construction; and F. Fire protective and warning equipment or system.

In the last section of this code, prescribes the penalty as similar to Japanese Fire Service Law.

Regarding the RULE, it has enormous number of regulations, consisting of RULE 1.101 to RULE 43.105.

As peculiar regulation of the Philippine, because LPG is widely used as energy source, the rule of LPG treatment is prescribed in detail.

The fire code in the Philippines is similar to that in Japan. The regulations used in the Philippines are in more detail, which is easier to understand.

***Chapter 10. Disaster Management Systems***

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## **CHAPTER 10. DISASTER MANAGEMENT SYSTEMS**

### **10.1 Introduction**

This chapter presents some key results and findings from extensive research into the existing disaster management systems in the Metro Manila area. The term “disaster management systems” is intended to encompass the following general elements:

- 1) Legal framework: The framework of laws, statutes, executive orders, and implementing regulations that establish the legal authority for programs and organizations that relate to hazards, risk, and risk management.
- 2) Institutional arrangements: The framework of organizations and institutions, governmental and non-governmental, with a recognized role to play in hazards and risk management, and the mechanisms for inter-institutional coordination.
- 3) Plans and programs: Guidance, plans, procedures, and activities related to all aspects of disaster risk management, such as emergency response, public awareness, and implementation of risk reduction measures.

#### **10.1.1 Methodology**

Information and data were gathered primarily through interviews with representatives of key organizations and institutions, a questionnaire, and two major workshops. In addition, a wide variety of documents was reviewed in detail, including:

- 1) Existing and proposed legislation, regulations, and implementing memoranda at the national, regional, and city/municipal levels
- 2) All available disaster management plans at each level
- 3) Documentation and lessons learned from various exercises, workshops, and the 1990 Luzon earthquake
- 4) Previous published and unpublished academic studies and other assessments including the Global Earthquake Safety Initiative (GESI).

These data were evaluated in relation to a set of key factors and indicators for disaster management as presented in Table 10.1.1, Assessment Matrix, below. This matrix was developed especially for this Study and incorporates consideration of several models, notably the Capability Assessment for Readiness (CAR) developed by the Federal Emergency Management Agency (now part of the Department of Homeland Security) and National Emergency Management Association (NEMA) in the U.S., and the Philippines’ National Disaster Coordinating Council’s (NDCC) Assessment Checklist on Local Government Units (LGUs) Basic Disaster Management Capability.

**Table 10.1.1 Assessment Matrix**

	<b>Key Factor</b>	<b>Criteria / Indicators</b>
1	Legal Framework	<ul style="list-style-type: none"> <li>▪ Laws, implementing regulations, and enforcement mechanisms in place for risk reduction and preparedness</li> </ul>
2	Institutional Framework	<ul style="list-style-type: none"> <li>▪ Degree of organizational development</li> <li>▪ Clear roles and responsibilities of entities and recognition of those roles</li> <li>▪ Recognition and respect for disaster management organizations</li> <li>▪ Active inter-institutional mechanisms in place, e.g. committees</li> </ul>
3	Emergency Planning	<ul style="list-style-type: none"> <li>▪ Existence and quality of emergency response plans and SOPs at every level and in each institution</li> <li>▪ Up-to-date; periodically tested through drills and exercises</li> <li>▪ Sets priorities and procedures for key functions, etc.</li> </ul>
4	Decision-Making and Incident Command	<ul style="list-style-type: none"> <li>▪ Systems for situation assessment and command and control are functional</li> <li>▪ Clarity regarding who is in charge</li> </ul>
5	Inter-Institutional Coordination	<ul style="list-style-type: none"> <li>▪ Mechanisms are in place and actively coordinate among sectors and organizations</li> <li>▪ Functional disaster operations centers</li> <li>▪ Inter-organizational communications systems</li> </ul>
6	Response and Recovery Capability	<ul style="list-style-type: none"> <li>▪ Capabilities of key institutions at all levels for response and relief</li> <li>▪ Resilience of local communities and LGUs</li> </ul>
7	Training and Capacity Building	<ul style="list-style-type: none"> <li>▪ Training programs in place for LGU disaster action officers, DCCs at various levels, national government institutions, etc.</li> </ul>
8	Political Will	<ul style="list-style-type: none"> <li>▪ Incorporation of disaster risk management in the political value system</li> <li>▪ Official statements, policies</li> <li>▪ Formal decisions on risk reduction and planning</li> <li>▪ High level programs for promoting risk management, preparedness, etc.</li> </ul>
9	Leadership	<ul style="list-style-type: none"> <li>▪ Individual “champions” for disaster risk management influence others</li> <li>▪ Actions to promote disaster risk management</li> <li>▪ Active participation in studies, workshops, etc.</li> </ul>
10	Policy Impact	<ul style="list-style-type: none"> <li>▪ Incorporation of risk assessments and disaster prevention measures in development plans</li> <li>▪ Consideration of disaster risk in development and construction projects and land use plans</li> </ul>
11	Public Education and Information	<ul style="list-style-type: none"> <li>▪ Partnerships with the media for public information campaigns</li> <li>▪ Protocols for conveying emergency public information</li> </ul>
12	Community Action and Participation	<ul style="list-style-type: none"> <li>▪ Community-based disaster management and mitigation programs active in the area</li> <li>▪ Workshops or meetings promoting community action</li> </ul>
13	Private Sector and NGO Participation	<ul style="list-style-type: none"> <li>▪ Presence of NGOs active in disaster management activities e.g. training and public education</li> <li>▪ Participation of private sector entities in emergency planning, drills, etc.</li> </ul>
14	Implementation of Risk Reduction and Prevention Measures	<ul style="list-style-type: none"> <li>▪ Evidence of mitigation actions, e.g. enforcement of building and fire codes, seismic-resistant construction, non-structural mitigation measures, back-up power for critical facilities, etc.</li> </ul>

While it is not possible to assess all levels or entities of government present in the Metro Manila area in relation to each of these factors, the matrix has served throughout the study as a benchmark for discussion and self-evaluation by concerned entities and stakeholders as well as the direct study participants.

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## 10.1.2 System of Governance in Metropolitan Manila

Metropolitan Manila is composed of 13 cities and 4 municipalities and is also the seat of the Government of the Republic of the Philippines. The system of governance in Metro Manila, therefore, is characterized by multiple jurisdictional layers and entities, which creates special complexities when it comes to managing disaster risk and responding to disaster situations.

Over the past 50 years, decentralization and local autonomy have been a continuing issue in central-local government relations.<sup>i</sup> In 1991 the Local Government Code was enacted through passage of Republic Act No. 7160 to provide a comprehensive framework for decentralization and exercise of power by local governments. Through the Code, responsibility for basic services and regulatory functions was transferred to the Local Government Units (LGUs) with the intention of developing self-reliant communities and more effective partners for the attainment of national goals. This principle is consistent with the basic approach to disaster management in the Philippines, which emphasizes local self reliance through the mobilization of all resources available locally in both governmental entities and civil society.

At the regional level in the National Capital Region (NCR), in 1994 Congress created the Metropolitan Manila Development Authority (MMDA) through the passage of Republic Act No. 7924. The Act establishes the State policy of treating Metropolitan Manila as a special development and administrative region responsible for planning, supervising, and coordinating certain basic services, “without prejudice to the autonomy of the affected local government units.”<sup>ii</sup> As a result, MMDA has jurisdiction over services which have metro-wide impact:

- 1) Development planning
- 2) Transport (including mass transportation systems) and traffic management
- 3) Solid waste disposal and management
- 4) Flood control and sewerage management
- 5) Urban renewal, zoning and land use planning, and shelter services
- 6) Health and sanitation, urban protection and pollution control
- 7) Public safety (including preparedness for preventive or rescue operations during times of disasters, coordination and mobilization of resources, and the implementation of rehabilitation and relief operations in coordination with concerned national agencies)

The MMDA is governed by a board and policy making body known as the Metro Manila Council, headed by a Chairman appointed by the President and composed of the mayors of the 17 cities and municipalities comprising Metro Manila, the president of the Metro Manila Vice Mayors League and the president of the Metro Manila Councilors League. In addition, the heads of various national departments attend meetings of the Council as non-voting members. The Council meets regularly and is empowered to approve metro-wide plans, programs and projects and issue rules,

regulations, and resolutions deemed necessary by the MMDA to carry out the purposes of the Act. In view of the Council's composition and power and MMDA's responsibility for disaster preparedness and coordination, the Council has the potential to take a leading role in promoting the strengthening of disaster risk management systems in Metro Manila.

## **10.2 Legal Framework for Disaster Management**

### **10.2.1 Overview of Disaster Management Laws**

Major legal framework of disaster management is summarized in Table 10.2.1. The basic law and policy framework for disaster management in the Philippines was established by Presidential Decree 1566, signed by the President on June 11, 1978. The incremental accumulation of several laws over a period of forty years forms the legal historical antecedent of PD 1566. As early as 1941 the central government by action of the Philippine President issued Executive Order No. 335 which was designed to address extraordinary and emergency conditions during a crisis and which also created the Civilian Emergency Administration. In 1954 Congress approved Republic Act 1190 which created the National Civil Defense Administration (NCDA).

During the intervening years between 1967 and 1978 adjustments in the functions of the NCDA were made with the Office of Civil Defense created in Presidential Decree 1 in 1972 assuming the functions of the NCDA.

Then in June of 1978 PD 1566 established the National, Regional and Local Disaster Coordinating Councils countrywide. The Presidential Decree is still the legal basis and operative law that provides guidelines for the organizations or structures as well as functions of the existing Disaster Coordinating Councils at the national, regional, provincial, city and municipal levels including the barangays all over the country.

PD 1566 is complemented by city/municipal ordinances and resolutions legislated by local governments now and then in accordance with the powers given them in the Local Government Code.

**Table 10.2.1 Major Legal Framework of Disaster Management in the Philippine**

Law	Year	Focus	Enabling Laws	Remarks
PD 1566	1978	Creation of the NDCC, RDCC and Local DCCs	Rules and Regulations implementing the provisions of PD 1566 pursuant to Section 7	Strengthened by PD 477 (Re Calamity Fund) and RA 7160 (Local Government Code)
Local Government Code	1991	Barangay Disaster Management Provision Municipal Disaster Management Provision City Disaster Management Provision	Section 389 (6) Section 447 (IV) Section 458 (IV)	All codal provisions are in effect and are the legal basis for local government actions on disaster management.
Building Code (PD 1096)		Minimum requirements and standards of building design for buildings to protect against fires and natural disasters.		
Fire Code (PD 1185)		Inspection requirement, Provisions for safety measures for hazardous materials as well as for hazardous operations/processes, Provision for fire safety construction, protection and warning system, Conduct of periodic fire and exit drills.		
City Ordinances – Resolutions Municipal Ordinances – Resolutions		Contents are varied but disaster focused	Actions of Local Legislative Councils	

## 10.2.2 Overview of Disaster Management Policy

PD 1566 sets forth ten fundamental national disaster management policies, summarized as follows:

- 1) Self reliance, self help and mutual assistance are encouraged.
- 2) All available resources are used before asking for assistance.
- 3) Primary responsibility rests with government agencies in the area in coordination with the people.
- 4) All entities are to have emergency plans.
- 5) Planning and operation is also expected at the barangay level.

- 6) In absence of regional government, national government offices at the regional level shall be led and operationally controlled by the Regional Commissioner or official designated by the President.
- 7) Responsibility for leadership lies with the elected officials, e.g. mayors.
- 8) The provincial governor exercises operational control when a disaster covers multiple cities.
- 9) The national government exists to support the local governments.
- 10) Exercises and drills are to be conducted at all levels, “principally at the Barangays.”

### **10.2.3 Laws and Regulations at the Local and Regional Level**

PD 1566 is also the basic law governing disaster coordination in Metro Manila. It provides for the constitution of the Metropolitan Manila Disaster Coordinating Council (MMDCC) and the City/Municipal Disaster Coordinating Councils (C/MDCCs). The functions and duties of the Disaster Coordinating Councils, while defined in PD 1566, are supported by mayors’ executive orders and further strengthened in the case of 10 cities and municipalities by city/municipal ordinances and resolutions.

Policy circulars issued from time to time by the National Disaster Coordinating Council and the Metro Manila Council also supplement city/municipal ordinances as operating guidelines for the City/Municipal Disaster Coordinating Councils in Metro Manila. The NDCC has issued various Memorandum Orders on such subjects as:

- Encouraging volunteerism and community-based rescue, evacuation and relief operations
- Guidelines for reporting damages and requesting funding, foreign assistance, and use of the Calamity Fund
- Procedures and criteria for declaration of a State of Calamity
- Selection and awarding of outstanding DCCs and NGOs

National laws of countrywide application like the Local Government Code have provisions on disaster management which also apply to cities and municipalities in the National Capital Region. For instance, Sections 444, 445, and 465 (vii) of the Local Government Code authorize municipal and city mayors and provincial governors to carry out measures as may be necessary during and in the aftermath of man-made and natural disasters and calamities. The Barangay Captains under Section 389 (b-6) (Barangay Law) are likewise authorized and empowered to handle emergencies and disasters.

### **10.2.4 National Building Code of the Philippines (PD 1096)**

It specifies minimum requirements and standards of building design for buildings to protect against fires and natural disasters.



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Rule 1040 of the Occupational Safety and Health Standards (as amended) provides for the organization of disaster control groups/health safety committee in every place of employment and the conduct of periodic drills and exercises in work places.

The administration and enforcement of this Rule is reposed upon the Department of Labor and Employment, in co-ordination with the local government unit where the workplace is located.

Outline is explained in Chapter 9.1 in this report

### **10.2.5 Fire Code of the Philippines (PD 1185)**

This Decree requires, among others, the administrators or occupants of buildings, structures and other premises or facilities and other responsible persons to comply with the following:

- Inspection requirement by the Bureau of Fire Protection as a prerequisite to the grant of permits and/or licenses by LGUs or other government agencies concerned.
- Provisions for safety measures for hazardous materials as well as for hazardous operations/processes.
- Provision for fire safety construction, protection and warning system such as fire sprinklers, alarm devices, firewalls, fire exit plan, etc.
- Conduct of periodic fire and exit drills.

Outline is explained in Chapter 9.4 in this report.

## **10.3 Institutional System**

### **10.3.1 National Disaster Coordinating Council (NDCC)**

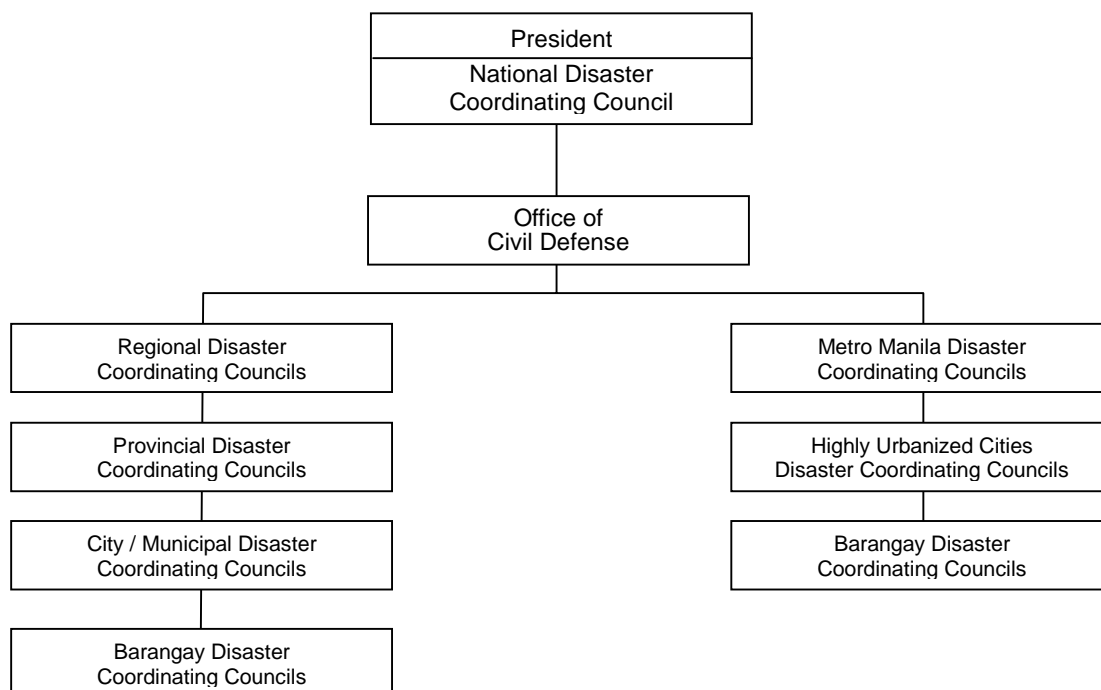
The National Disaster Coordinating Council (NDCC) is the focal inter-institutional organization for disaster management at the national level. It is chaired by the Secretary, Department of National Defense, and its members generally represent national government departments and the Philippine National Red Cross. The responsibilities of the NDCC are established in the National Calamities and Disaster Preparedness Plan (1989), as follows:

- Advise the President on the status of disaster preparedness programs, disaster operations and rehabilitation efforts undertaken by the government and the private sector
- Establish policy guidelines on emergency preparedness and disaster operations
- Establish priorities in the allocation of funds, services, disaster equipment and relief supplies
- Advises the lower-level DCCs through the OCD on guidelines
- Recommend to the President the declaration of a state of calamity

- Create an Action Group of permanent representatives from the member departments and other agencies with the Executive Officer as head
- Utilize the facilities and services of OCD in Camp Aguinaldo, Quezon City, in discharging its functions.

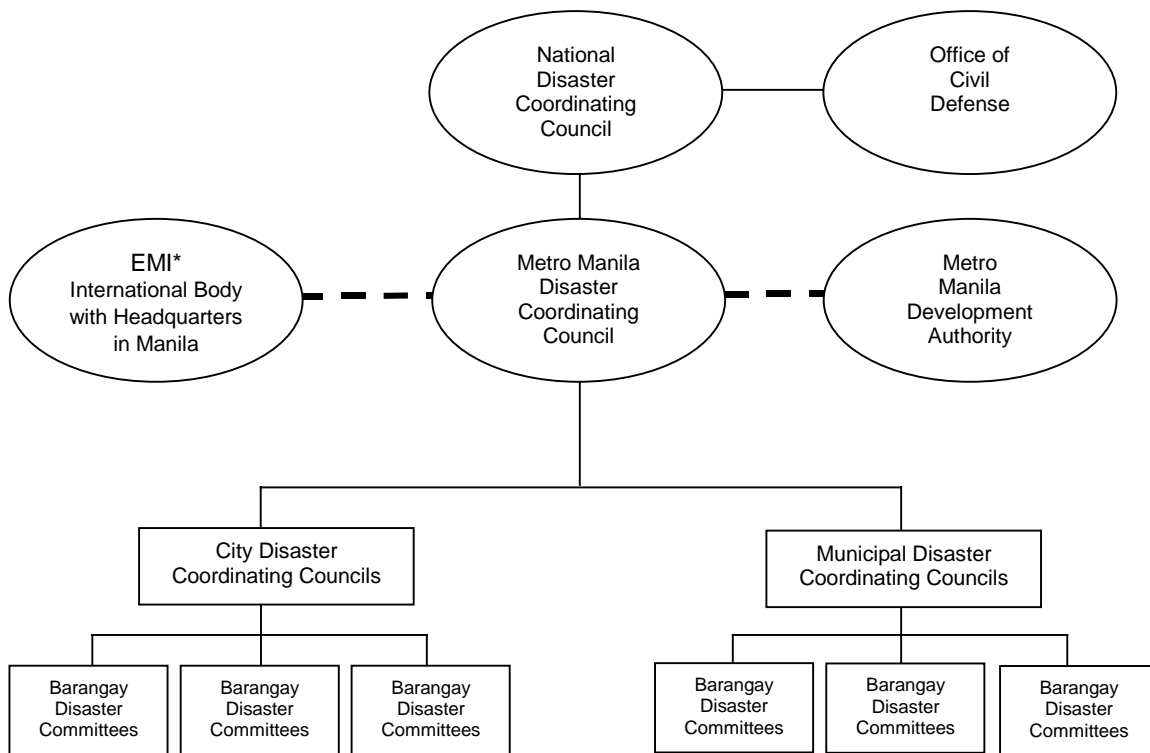
The NDCC Executive Officer (Administrator of the Office of Civil Defense) coordinates implementation of NDCC policies, convenes the Action Group and prescribes Action Group SOPs for monitoring of a disaster or impending disaster in the Civil Defense Operations Center, and otherwise supports the NDCC and advises its Chairman.

Under the “Rules and Regulations Implementing P.D. 1566,” the NDCC shares responsibility with the Department of Interior and Local Government (DILG) for organizing the political subdivisions from the regional to the barangay level for disaster management. Both are responsible for “spearheading” the organization of the DCCs, but DILG is to act as “the overseer” of the councils. Other governmental ministries and entities and large private institutions are responsible for establishing their own disaster control organizations. The NDCC and the DCCs at all levels are expected to meet regularly as well as before, during and after any disaster operations. However many if the Administrative regions do not have functional or viable Disaster Coordinating Councils at the regional level. See Organization Charts (Figure 10.3.1 and Figure 10.3.2) for the functional relationship between the NDCC and the regional and local DCCs.



**Figure 10.3.1 Organizational Chart of National Disaster Coordinating Council (1)**

Note: Functional relationship of NDCC with Regional & Subregional Councils

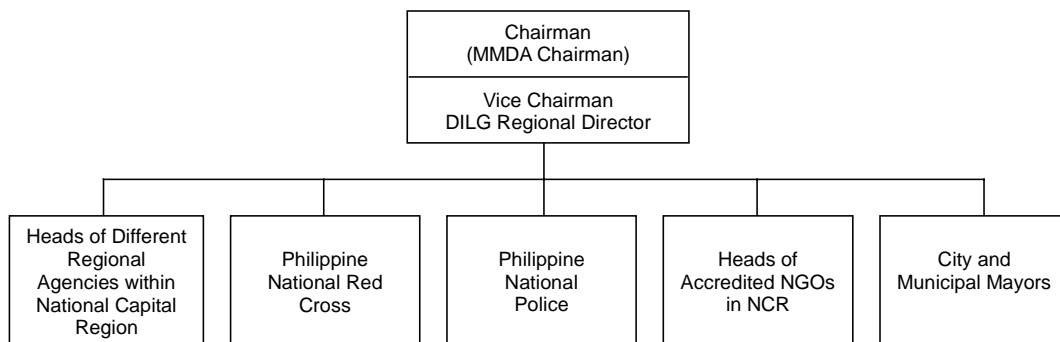


**Figure 10.3.2 Organizational Chart of National Disaster Coordinating Council (2)**

\*Note: Earthquakes and Megacities Initiative

### 10.3.2 The Metropolitan Manila Disaster Coordinating Council

The law and national plan provide for the establishment of a Metropolitan Manila Disaster Coordinating Council (MMDCC) chaired by the MMDA Chairman and with membership determined by the Chairman. MMDCC is responsible, in a disaster, for establishing a Disaster Operations Center (MMDOC) and coordinating from it the disaster operation activities of the local DCCs within Metro Manila.



**Figure 10.3.3 Organizational Chart, Metropolitan Manila Disaster Coordinating Council**

Note: The tasks of the thirty (30) members of the MMDCC are stipulated in the MMDCC document describing its mandates in times of disaster or emergency. However, this was stipulated 25 years ago and therefore needs a critical review.

Eight critically sensitive member agencies of MMDCC were visited for interviews as part of the capacity assessment of the MMDCC.

**1) Department of Budget and Management**

The regional office of the Department of Budget and Management (DBM) in the Metropolitan Manila Area has not “districted” the National Capital Region. It is the office that is primarily responsible for the:

- Review of the budgets of cities and municipalities in Metropolitan Manila;
- Release of the Internal Revenue Allotments for the local governments in the NCR. Estimated total IRA for 2004 is P151 B. The 2003 IRA fund was P141B.

DBM together with DILG released Joint Memorandum Circular No. 2003-1 dated March 20, 2003. This Memorandum Circular authorizes the pre disaster disbursements of the five (5%) percent calamity fund of cities and municipalities.

**2) Department of Education, Culture and Sports**

The Department of Education, Culture and Sports (DECS) - NCR has divided or organized the Metropolitan Manila Area into 14 school Divisions, which have a total of 3,391 schools and 45,109 teachers from preschool to college level.

The 14 school divisions are as follows:

- Division of Caloocan City
- Division of Las Piñas City
- Division of Makati City
- Division of Malabon and Navotas
- Division of Mandaluyong City
- Division of Manila
- Division of Marikina City
- Division of Muntinlupa City
- Division of Parañaque City
- Division of Pasay City
- Division of Pasig and San Juan
- Division of Quezon City
- Division of Taguig and Pateros
- Division of Valenzuela City

DECS perceived MMDCC as an overlapping council with the school functions in disaster management more so in the utilization of schools as evacuation centers. DECS regional office observed that evacuees destroy school facilities when schools are used as evacuation centers,

which is why DECS wants other MMDCC agency members to be more accountable in this regard.

The regional office wants a redefinition of accountability among government offices involved in disaster mitigation; who should do what in an emergency should be more clearly defined. The regional office has no funds for disasters.

Earthquake drills were undertaken in year 2000, primarily for high schools. However, earthquake drills were voluntary in private schools.

DECS' office lacks communication-monitoring equipment important during an emergency. MMDA has made recommendations to expand and improve the physical facilities of the regional office grounds to allow fire trucks to enter the regional office compound in case of fire and other emergencies.

### **3) Department of the Interior and Local Government**

The Department of the Interior and Local Government (DILG) is an MMDCC member agency that has general supervision over the performance of local governments in the NCR. It maintains department personnel in every city and municipality with a total personnel force of 250. DILG monitors the performance of local governments in the NCR. The Department provides information resources to local governments including the barangays and the general public.

It is currently undertaking a government information center at the barangay level which is a one stop shop for the public requiring referral services of various government agencies. There is actually a turf issue between DILG and MMDA over local governments in NCR.

The offices that are administratively under the supervision of the Secretary of DILG and which are relevant to the formulation of disaster mitigation strategies is the Bureau of Fire Protection (BFP) and the Philippine National Police (PNP). All cities and municipalities in the Metropolitan Manila Area have fire stations in their respective jurisdictions. The cities and municipalities usually provide the gasoline as well as other operating expenses of the fire trucks and other equipment since the Bureau has inadequate funds to maintain these fire trucks and equipment always in good condition. There are only 92 fire trucks of the BFP in the NCR, and the fire trucks in most cities and municipalities are inadequate to effectively counter large conflagrations during a disaster.

The police, on the other hand, which are also under the supervision of DILG, are currently pre-occupied with preventive measures against terrorism. The PNP, therefore, has somehow been relegated as priority police functions in case of disaster. In spite of this focus on terrorism, the

police still can provide police forces necessary to maintain peace and order in disaster affected areas.

#### 4) **Department of Health**

The Department of Health (DOH) is the lead agency for health services in the NCR and it provides health services through the Health Emergency Management Services (HEMS), which has a staff of 6 officers and staff. HEMS can be easily activated with large personnel forces from other units consisting of doctors, sanitary inspectors and disease control officers.

DOH-NCR supervises some 47 hospitals in Metropolitan Manila. It has divided MM hospitals into four districts as follows:

1st District Valenzuela Hospital serving

- Caloocan
- Malabon
- Navotas
- Valenzuela

2nd District Taguig-Pateros Hospitals serving

- Marikina
- Quezon City
- Pateros
- Taguig

3rd District – Manila Hospitals serving

- Makati
- Mandaluyong
- Manila
- San Juan

4th District – Las Piñas Hospital serving

- Las Piñas
- Muntinlupa
- Parañaque
- Pasay

HEMS is currently improving its existing network to improve its overall capabilities for disasters and emergencies. HEMS consider earthquakes as psychological trauma cases, thereby getting assistance from psychologists in case of disasters caused by earthquakes.

It has 4M for drugs and medicines for 2003. The last training on earthquake mitigation was five years ago.

Like the DSWD, HEMS does not have any disaster manuals except an Emergency Preparedness Guidebook on Health Emergency Management. HEMS recommended that government should exert efforts to have private hospitals more open to victims of disasters or emergencies rather than

apply their stringent rules of receiving patients. HEMS expressed its need for monitoring equipment such as radios, handy phones and other means of communication in case of disasters or emergencies. At present, it has a small radio that allows the office of HEMS to communicate with the 47 hospitals in MMA.

At the time when the interview was made, HEMS was actually strengthening its networking with various agencies and institutions in the Metropolitan Manila Area that are concerned with disaster mitigation. It is note worthy to mention that the networking initiative by HEMS was triggered by MMEIRS.

#### **5) Department of Public Works and Highways**

The Department of Public Works and Highways (DPWH) is responsible for the construction and maintenance of all national roads in Metropolitan Manila including the supervision of 12 vital bridges connecting North and South Manila crossing the Pasig River.

DPWH has divided NCR into five engineering districts as follows:

Manila Engineering District - This includes the six Congressional districts of Manila

Quezon City Engineering District - This includes the four Congressional Districts of Quezon City

1st Metropolitan Manila Engineering District

- San Juan
- Mandaluyong City
- Pasig City
- Taguig-Pateros
- Marikina City

2nd Metropolitan Manila Engineering District

- Las Piñas
- Muntinlupa
- Makati I
- Makati II
- Parañaque
- Pasay

3rd Metropolitan Manila Engineering District

- Caloocan I
- Caloocan II
- Malabon/Navotas
- Valenzuela I
- Valenzuela II

DPWH maintains Disaster Reaction Teams that work 24 hours a day when a disaster or emergency occurs like a metro wide flood or typhoon.

It is making an inventory of alternative routes if and when the ordinary roads are impassable. Its problem is modernizing its fast aging construction equipment.

#### **6) Department of Social Welfare and Development**

The Department of Social Welfare and Development (DSWD) - NCR office is the only contact office for assistance in the Metropolitan Manila Area. Unlike the other member agencies of MMDCC which have divided Metropolitan Manila into districts, DSWD has only one office for the NCR region.

DSWD has 580 personnel. The focus of lateral cooperation with other government agencies is achieved through the local government level, which is the immediate contact of DSWD in case of disasters or emergencies.

DSWD has a Daily Disaster Team operating from Monday to Friday. This team consists of a:

- Team Leader – SWA personnel
- Social Worker
- Medical Doctors
- Nurses
- Psychologist

This team has been organized some two years ago. At the same time, DSWD-NCR also has organized a Crisis Intervention Unit, which operates 24 hours a day with a hotline. It is composed mostly of social workers and nurses. DSWD also maintains a stockpile of 1,000 food packages every month plus a standby fund of P300,000, which amount can be augmented during a disaster.

The office also conducts trainings for local government officials on disaster management once a year. DSWD evaluates the evacuation centers every two years. The office has accredited 15 NGOs as partner institutions. The DSWD has recommended that local governments have their own evacuation centers.

DSWD needs to improve its overall capability for disasters are the following:

- Communication equipment
- Computers
- Monitoring equipment
- Vehicles

DSWD is continuously improving its overall capabilities for disasters through expansion of its network and improving its overall capabilities in coordination with agencies providing similar social services such as PNRC, charitable institutions such as the Philippine Sweepstakes Office.



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## 7) Office of Civil Defense

The Office of Civil Defense (OCD) is the central coordinating office for disaster mitigation which includes plans and activities in the Metropolitan Manila Area and in the country. OCD provides policy guidelines in planning for disaster mitigation countrywide. It also formulates manuals on calamity planning and preparedness.

Because its headquarters is located in Metropolitan Manila, it overshadows MMDCC thereby reducing to the minimum the institutional visibility of MMDCC as a regional council for disaster in the NCR. According to OCD, MMDCC is likewise overshadowed by the private sector in providing support necessary for disasters like earthquakes, as exemplified by the Chinese Volunteer Fire Brigade and PLDT Emergency Team which are well organized to protect PLDT equipment during disasters while at the same time provide services to disaster victims. The same is true as to the types of services delivered by big corporations like Meralco.

OCD is also working closely with the Earthquakes and Megacities Initiative (EMI), an international non-governmental organization based in the Philippines, in various activities related to awareness and mitigation of earthquake risk. OCD is also the focal agency of the national government in the coordination of countrywide disaster mitigation strategies including their implementation.

## 8) The Philippine National Red Cross

The Philippine National Red Cross (PNRC) is the only NGO member of the MMDCC. It has organized Metropolitan Manila into four chapters, i.e.:

- Caloocan
- Manila
- Quezon City
- Pasig

PNRC provides six disaster related services:

- Blood banking
- Community health and nursing services
- Safety services
- Social services
- Volunteer services
- Youth program

In addition to its six services, PNRC also constructs small infrastructure, e.g. water supply, footpaths, or bridges, all foreign funded by donors like the Canadian Red Cross or the Japanese Red Cross.

PNRC operates primarily with its fund largely from domestic and foreign donations. It has produced some pamphlets and tip-guides concerning what to do in a disaster. However, these are not widely circulated for lack of funds to print them.

### 10.3.3 City and Municipal Disaster Coordinating Councils in Metro Manila

City and municipal Disaster Coordinating Councils are to be chaired by the mayor and vice-chaired by the station commander of the INP, with the remaining membership including all city/municipal officials and all national officials working at the city/municipal level. The city and municipal DCCs are also expected to establish a disaster operations center and coordinate from it disaster operations activities, implementing the guidelines set by the NDCC and advising the barangay DCCs regarding disaster management. The barangay DCC has the barangay captain as chairman and leading persons in the community as members. The barangay DCC has similar responsibilities as the higher level DCCs.

In the thirteen cities and four municipalities in the National Capital Region, there is a total of 1,693 barangays distributed as follows:

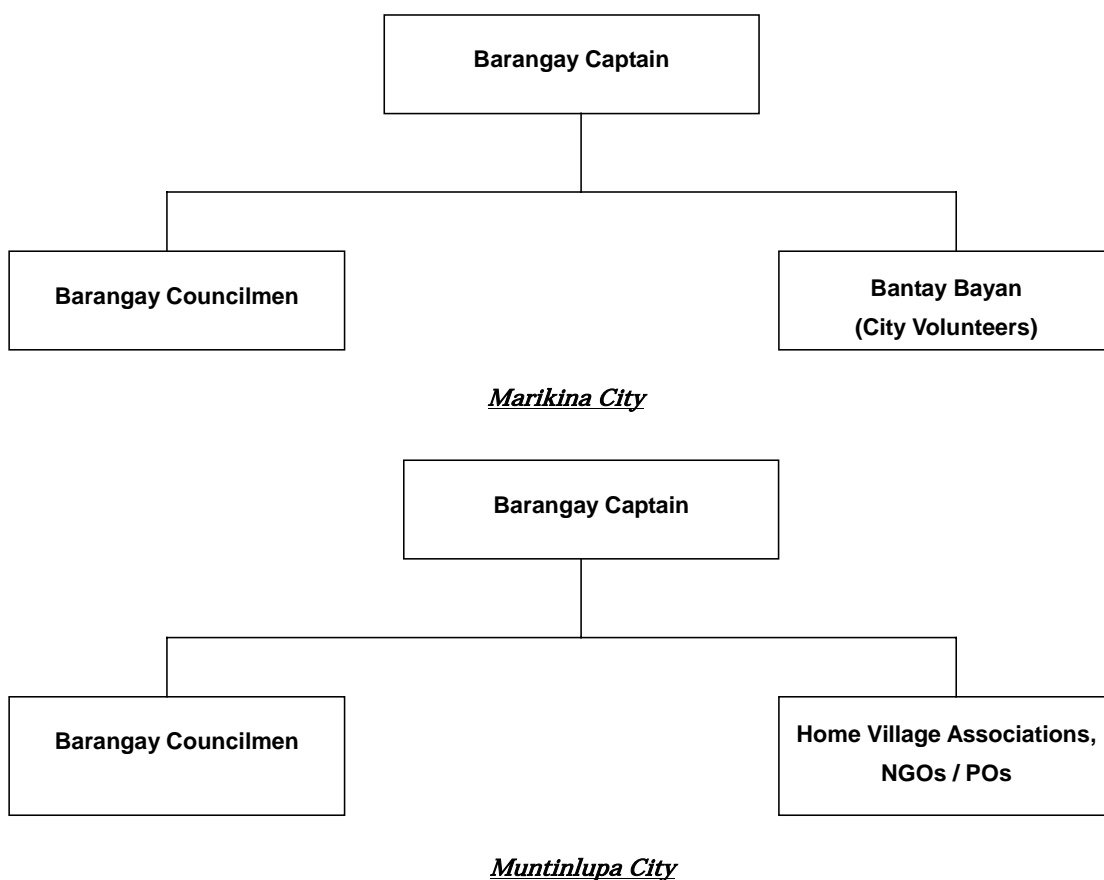
Cities/Municipalities	Number of Barangays
1. Caloocan City	188
2. Las Piñas City	20
3. Malabon City	21
4. Makati City	33
5. Mandaluyong City	27
6. Manila	897
7. Marikina City	14
8. Muntinlupa City	9
9. Navotas	14
10. Parañaque City	16
11. Pasay City	201
12. Pasig City	30
13. Pateros	10
14. Quezon City	142
15. San Juan	21
16. Taguig	18
17. Valenzuela	32
<b>Total Barangays</b>	<b>1,693</b>

Source: National Barangay Operations Office, DILG

Theoretically, therefore, there are 1,693 Barangay Disaster Coordinating Councils (BDCCs) in Metro Manila. A typical Barangay Disaster Coordinating Council organization has the Barangay Captain as head of the Disaster Council. The members consist of the Barangay Councilmen, organized tasks forces and community volunteers. In many cities in the National Capital Region, homeowners associations are organized into task forces of the Barangay Disaster Coordinating Councils. However, it is likely that many of the BDCC are organizations that exist on paper only

in symbolic compliance with the requirements of the National Calamities and Disaster Preparedness Plan. Many BDCCs are not fully functional and at times are reactivated only in case of emergency or crisis such as a conflagration or flood.

The practice in the utilization of BDCC varies from one city to another. In Marikina a Barangay Disaster Coordinating Council is only mobilized if the barangay is under a crises or disaster. In Muntinlupa, inter-barangay cooperation in times of emergency is a tradition. Manila Barangay Disaster Coordinating Councils have similar arrangements as Caloocan, Muntinlupa and Pasay City using the bayanihan spirit.



**Figure 10.3.4** Typical Organization of Barangay Disaster Coordinating Councils

### 10.3.4 Review of Six City/Municipality Disaster Coordinating Councils

An indicative profile of the capabilities of large cities and small municipalities in NCR, which are reflective of cities/municipalities similarly situated, is presented by the results of the evaluations conducted in selected cities and municipalities, which follow.

## 1) Makati City

Makati is the premier city in Metropolitan Manila with an annual budget of P4,735,584,330.00 and a 5% Calamity Fund of P236,779,216.50. However, the experience of the City is that the whole amount of the fund for calamities is generally not spent completely year to year.

The City has thirty-three (33) barangays. The City Government has some 7,000 personnel serving a city population of 450,000. It is estimated that there are some 2,000 buildings in Makati City.

The City Disaster Coordinating Council (CDCC) meets regularly every last Thursday of every month. All department heads who are members are consciously aware of their mandates in the event that a disaster or an emergency occurs in Makati.

Some of the equipment for disaster in the city is as follows:

- Rubber boats
- Cutter
- Spreader
- Airlift bags
- Portable generators
- Radios

The City has taken advantage of the joint DBM-DILG MC No. 2003-01 by purchasing equipment and supplies for terrorism and SARS.

The City has trained some 40% of the building officers in the private sector on how to retrofit or strengthen all buildings in the city in case of earthquake or fire. The last earthquake mitigation course was undertaken some five years ago.

The CDCC also works closely with the private sector like the Ayala Corporations and has inter-local cooperation with the City of Mandaluyong.

The Social Welfare Department (DSWD) has 145 personnel and staff which provide social services and relief during disasters. The DSWD of the city has a monthly stockpile of food, medicines and other disaster related supplies like detergents, clothing worth of P1.4 Million. The problem in this regard is that they cannot stock more supplies for lack of warehouse facilities. While the DSWD office has undertaken several disaster training courses for its staff and personnel, no recent training on earthquake mitigation has been undertaken.

The city during disasters does not use schools in the city as evacuation centers. The city has pre-identified what they call “covered courts,” which are used as evacuation centers during flood or the same are used by the victims of fire.

In the City Hall and in every room of the 22-story building, the city disaster office has organized what is called the first responder in every floor. There is no disaster management plan of the city. However, every threat is addressed as effectively as possible. The city is also contemplating constructing a one hundred million pesos Emergency Center, where the fire and police departments, including an emergency communications center, will be housed.

## **2) City of Manila**

Manila has a land area of 35 sq. km. and is densely populated with 2.5 million population nighttime and 3.5 million people during the day. It has the largest number of barangays (896), 53% of the total number of barangays in the NCR.

The six old districts of Manila are:

- Ermita
- Malate
- Pandacan
- Quiapo
- Sampaloc
- Sta. Cruz

These six districts dividing Manila have been geographically altered after the approval of the Local Government Code and in addition Manila was further redistricted based on the six congressional seats for the city.

The present six districts are organized into one hundred (100) zones. Each zone comprises of barangays and barangays in turn are administratively divided into kagawad sectors, which are components of the barangays.

The city government has some 10,000 employees. One important office in the city is the Barangay Bureau with 120 employees and staff. The Barangay Bureau handles all barangay matters, which includes disaster mitigation.

The head of the Barangay Bureau sits in the CDCC. The meetings of the CDCC are set every last Thursday of the month, although the council does not regularly meet. However, the mayor meets regularly with the Peace and Order Council whose members are also members of the CDCC.

Volunteerism in disaster mitigation is quite high and significant in the city. At present there are eight (8) volunteer response groups, each with 75 volunteers who offer their services in times of

emergency such as fires or floods. Examples of the response group are the Emergency Medical Team (EMT) and the Chinese Fire Volunteers Brigade. Eighty (80%) percent of the volunteers providing services in the NCR is coming from Manila.

The office of the mayor manages four city hospitals, which are on 24-hours duty during every occurrence of fire, flood or typhoons. These hospitals are in Tondo, Sampaloc, Del Pan and Ospital ng Maynila.

The City Social Welfare Office stocks foodstuffs like rice, sardines and used clothing. The City Health Department also stockpiles medicines for relief services.

The Engineering Department has condemned many old buildings constructed prior to the Building Code implementation. The City Engineer also requires the refitting of old buildings, once these buildings are to undergo repair. This is the same policy or practice in Pasig City.

The City of Manila owns several generators, which can generate electric power in times of emergency.

The city has defined who is in charge in every specific threat. In case of fire, it is the Fire Marshall of the Bureau of Fire Protection (BFP). DILG is the lead official. During floods or typhoons, it is the city mayor.

There are also very active community services during these emergencies. In the office of the City Administrator, the city government organized the Manila Emergency Response Group.

The city is planning to integrate into one Master Disaster Management Plan many of the sectoral plans and activities prepared for disaster or emergency. The primary consideration of this plan is to achieve a much better command system.

The City of Manila has no ordinance on disaster mitigation. It has also very insignificant equipment and tools for disaster, i.e. radios, fire trucks, and few ambulances.

Manila is currently planning to purchase new equipment for disasters and emergencies as authorized under DBM-DILG joint Memorandum Circular dated March 2003 on the use of the five percent calamity fund prior to the occurrence of a disaster.

### **3) The Municipality of Navotas**

The Municipality of Navotas is one of the smallest municipalities in the Metropolitan Manila Area. The municipality has 14 barangays and is densely populated with a population of 234,403 (2003 Census). The municipal government has 1,800 government personnel that provide the basic services of the municipality to its residents. The MDCC has been reorganized into

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subcommittees in order to distribute responsibilities as well as pinpoint accountability of the members thereof.

Some of the subcommittees of the MDCC are:

- Resource Management Operations
- Plans and Programs
- Intelligence Analysis
- Communication and warning
- Public Information and Monitoring
- Rescue and Engineering
- Health and Medical Services, and
- Welfare Rehabilitation

This arrangement was authorized under the Mayor's Executive Order No. 008-03 dated March 2003.

The MDCC does not meet regularly. However, the mayor meets all the department heads every Monday to resolve issues and problems prevailing including plans and programs in each department some of which are disaster related. In addition to the meeting of the department heads every Monday, the mayor also meets the members of the local council.

Navotas has no ordinance on disaster mitigation. Local officials want to get a copy of the model ordinance formulated by the Study Team. Some members of the MDCC expressed the need for the MDCC members to undertake capability building training. Training of the MDCC members is presently planned with emphasis on public safety, basic life support and rescue operations.

The town will take advantage of DBM-DILG Joint Memorandum Circular dated March 2003 by buying the following equipment:

- Fire trucks
- Cutter or spreader
- Rubber boats
- Water pumps
- Radios

They will also use part of the calamity fund for training the members of the BDCCs. Disaster management in the town of Navotas is being coordinated by the Barangay Operations Center under the Office of the Mayor.

All these purchases of equipment and training courses on disaster were decided only recently, after objections from the Commission on Audit (COA) on the use of the 5% calamity fund were settled.

#### **4) Pasig City**

The City of Pasig does not have a City Disaster Coordinating Council that meets regularly. The City Administrator pointed out the need to hold regular CDCC meetings. However, the City has a program called *Lingap sa Barangay* (Barangay care) where the mayor, together with all department heads, meets the 30 barangays and their officials including the citizens every Saturday. This Saturday dialogue provides an effective avenue where all the problems of the barangays are addressed by the city government. This weekly dialogue is actually an action conference where disaster related problems are likewise discussed.

Pasig City has an old integrated disaster plan, which is currently being updated by the City Disaster Coordinating Officer.

Old buildings in the City which were constructed prior to the effectivity of the Building Code are required be strengthened when the owners ask the city for a permit to repair these old buildings.

There are 1,200 plantilla positions in the city government serving a population of 600,000. Pasig City has one city hospital with a 120-bed capacity.

For the year 2003, Pasig City has an Annual Budget of 3,000,000,000.00 and a Calamity Fund of P150,000,000.00. Like Makati City, Pasig City is not completely utilizing its full 5% Calamity Fund but only to a level of P80,000,000.00. Part of this amount is spent for terrorism and the SARS program of the city government.

#### **5) Quezon City**

Quezon City has 25% of the land area of Metropolitan Manila and 20% of the total population of the NCR. It has a total of 142 barangays, some of the biggest of which are Barangays Commonwealth, Payatas, Holy Spirit and Batasan Hills.

The City Disaster Coordinating Council meets regularly in the first week of every month. The city mayor, the city administrator and the City Local Government Director (DILG) take turns in presiding over the meetings of the CDCC.

The Department of Public Order and Safety (DPOS) is the overall coordinating office for disaster operations.



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However, all barangay affairs in the city are being coordinated by the Barangay Operations Center under the Office of the Mayor. This means that DPOS will have to coordinate not only with CDCC members but the Barangay Operations Office as well during disasters.

Quezon City is to purchase equipment for emergency purposes like the following:

- Fire trucks and other fire equipment;
- Dry pipes for installations to inaccessible barangays where the firetrucks cannot even enter. Water is then provided to these inaccessible barangays from the water tank through the pipes;
- Water pumps for barangays near creeks and rivers
- Portable radios for the barangays that do not have radios or similar means of communication

All these will be purchased with the use of the five (5%) percent Calamity Fund as authorized under DBM-DILG Joint Circular No. 1 issued in March 2003.

Every threat to the city such as typhoons, floods or fires and or earthquakes has standard operating procedures in place. The Disaster Operations Center under the DPOS is the monitoring center for every disaster action the city will undertake in response to a specific threat.

The city undertakes earthquake drills with schools every quarter. It is also undertaking yearly consultation with malls, hotels, schools and restaurants regarding their state of disaster preparedness.

During floods and similar disasters like fires, the city also uses covered courts like Makati City or the schools as the last resort.

The CDCC or DPOS is dependent on OCR for printed materials on disaster. The city, however, has a Disaster Preparedness Manual formulated in 1996, which is presently being updated.

Quezon City in case of heavy floods, calls on the Navy for assistance. Units of the Philippine Navy in turn send to the city amphibian vehicles including rubber boats. During this period DPOS maintains a 24-hour Disaster Watch.

The City Social Welfare Office, in case of floods or fire, provides P15.00 per day per victim in addition to foodstuffs, which the office distributes to victims.

Quezon City at present has no ordinance on disaster mitigation.

## **6) Taguig**

Taguig is one of the smallest municipalities in Metropolitan Manila with 18 barangays and a population of 500,000. It has an income of P695,943,000.00 and a Calamity Fund of

P34,797,150.00. The Municipal Disaster Coordinating Council meets irregularly. While it is organized and its members represent those mandated to be in the disaster council per PD 1566, it is not functional in the sense that the Barangay Affairs Office, under the Office of the Mayor, is in practicality responsible for all disaster mitigation activities and programs and coordinates with other agencies the overall activity of the municipality in response to disaster.

The municipality has no master plan on disaster mitigation. The local DILG office is designing a disaster management training program for both the members of the MDCCs and the BDCCs. The training will be conducted with the assistance of OCD and the Emergency Management Institute of the Philippines (EMIP).

## **10.4 Review of Barangays**

### **10.4.1 Makati Barangays**

There are 33 barangays in the City, which are provided with radios and handy phones. Each BDCC has ten members. While all BDCCs are chaired by the Barangay Captains and with one Barangay Kagawad as a member, the membership overall varies from one barangay to another. The League of Barangays supported by government agencies i.e. DILG, DSWD and DOH undertakes yearly training on disaster management. In 2003 the City initiated an assessment of the functionality and preparedness of Makati barangays, with the assistance of the Office of Civil Defense, to counter disasters.

The richest barangay is Bel-Air with an income of P102,123,336.58, and the poorest is Northside with an income of P8,292,890.67.

### **10.4.2 Manila Barangays**

The City of Manila has 896 barangays or 52.98% of the total number of barangays in the National Capital Region. Several barangays are organized into zones. Manila has 100 of these zones, which in turn are components of the six geographic and political districts of the city.

The Barangay Bureau of the city government is the office in charge of the Barangay Disaster Coordinating Councils. This is the office in the city government that is responsible in monitoring and supervising all barangays.

There are many BDCCs which are already organized. However, in some areas of the city, the BDCC's function is identified or perceived to be similar with the responsibilities of the fire and tanod brigades in the barangays. Therefore, the functionality of the BDCC is not really an urgent consideration. In the barangays, the same people who are members of the BDCC are also the ones staffing the fire and tanod brigades

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The members of the BDCCs in Manila are similar to the composition of BDCCs in Makati, Quezon or anywhere else in the NCR. While variations of members representing a particular association or community based organizations exist, these do not alter the “standard” members of the BDCC i.e. barangay chairmen, one or two of the barangay council members.

Community volunteerism in Manila is high during disasters and emergencies.

Some BDCCs in Sampaloc and Tondo districts have mini fire trucks, one or two ambulances and a rescue van.

A large percentage of the BDCCs badly needs communication equipment. The barangay Bureau is reviving the request for more radios and communication equipment for the use of BDCCs.

Most of the training on disaster is primarily focused on fire drills. Prior to 2002 there was an earthquake response exercise conducted by the Barangay Bureau. The new set of barangay officials who were elected in 2002 has no training on earthquake mitigation.

Out of the 896 barangays in Manila, Barangay 649 which is the Baseco Compound has a budget of P4,284,080 which is the highest for Manila and Barangay 388 or Concepcion Aguila near Quiapo has the lowest budget of P370,551.

These budgets at first glance look very low compared to the budgets of other barangays, say the urban barangays in Makati. However, in Manila, a one street residential area of no less than 1,000 population is created as one barangay. There are many of these cases and these barangays do not have much tax base

### **10.4.3 Navotas Barangays**

The membership of the BDCC of the 14 barangays of Navotas varies from one barangay to another, just like the composition of the BDCC in other cities and municipalities in Metropolitan Manila. Coordination of BDCC activities is through the Barangay Operations Center in the Office of the Mayor. The MDCC once contacted by the Barangay Operations Center provides the necessary support in cases of disaster i.e. flood and fire.

So far, no training has been conducted for the members of the BDCCs. Communications from the barangay to the MDCC are either by cell phones, radios or telephones to the Barangay Operations Center. Some barangays have radios, and others have water pumps like barangays San Roque, San Jose, Tagus and Daang Hari

The BDCC is completely relying on the capabilities and resources of the MDCC. The president of the League of Barangays meets all the BDCCs every month to discuss barangay programs,

problems including disaster management requirements. Barangay Chairmen and members meet every month to discuss the problems in disaster management in their respective communities.

There are no pamphlets available or printed materials by any of the disaster offices in Navotas. This is one of their urgent needs for public education and information dissemination program.

The BDCCs are very weak organizations. There is a strong need for them to be mobilized as recommended by the majority of the MDCC members.

Barangay North Bay Blvd. has the highest budget for 2003 in the amount of P18,255,430.40. Barangay Bagumbayan South has the lowest barangay budget for 2003 in the amount of P1,549,096.40

#### **10.4.4 Pasig Barangays**

There are thirty (30) barangays in Pasig. The majority of BDCCs are evaluated to be functional. The Barangay Chairman chairs the BDCC and the members at times vary from one barangay to another. However, regular members are the Barangay Tanod, a Barangay Kagawad and community volunteers. Large barangays in the city have mini fire trucks and fire brigades. Fire drills are conducted once a year with the technical assistance of the Bureau of Fire Protection, DILG.

Barangays have handy phones for communication, which are connected to the Pasig Police Station and to the City Mayor. BDCCs needs regular training more so in earthquake mitigation. Barangay San Antonio (Ortigas) has the highest barangay income of P68Million while Barangay Santa Rosa has the smallest income of Three Million.

#### **10.4.5 Quezon City Barangays**

There are 142 barangays in Quezon City. Less than one half is functional in terms of being able to respond effectively to a disaster or emergency. The composition of the BDCCs varies from one barangay to another within the city. The BDCC is composed of members similar to those BDCC in Makati, Muntinlupa or Pasig.

The most functional BDCCs are those in flood prone areas like barangays Tatalon, Roxas, Talayan, Commonwealth and Manresa.

Some barangays in the city have some radios, while others do not.

Some of the problems identified that should be resolved to improve the overall capabilities of barangays for disaster or emergency are the following:

- Periodic training for BDCC members as well as CDCC
- Create awareness of the importance of disaster preparedness among the citizenry

- Formulate printed materials on disaster mitigation and the dissemination of same to the public
- Capability building in terms of better organizations, resource mobilization, etc.
- Priority areas for these activities should not only include BDCC but the business sector as well.

No complete or overall estimates of the barangay incomes were made available. However, from the Real Property Tax shares, which the barangays in the city is entitled, the richest barangay in the city is Barangay Socorro with P7,777,802.35 and the poorest is Barangay Escopa I with P1,171,649.88. Both figures are for the year 2003.

#### **10.4.6 Taguig Barangays**

There are 18 barangays in the municipality. The BDCCs are not functional. No training has been held for BDCCs since the Barangay Election in 2002. It has been observed that the composition of the BDCC members varies from one barangay to another. This is prevailing in many cities and municipalities. Illustrations of this differentiation in the composition of the BDCCs are the following:

##### **Barangay Lower Bicutan Barangay Disaster Coordinating Council**

Barangay Captain	Chairman
First kagawad	Vice Chairman
Members	
Barangay Treasurer	Head, Supply Committee
Chief Tanod	Head, Security Committee
General Service Office	Head, Transportation
Chief Investigator	Head, Communication
Deputy Chief Tanod	Head, Evacuation
Head Doctor, Health Center	Head, Medical Committee
Barangay Secretary	Head, Relief Committee

##### **Barangay Ususan**

All the barangay officials from barangay captain and all barangay council members are the members of the BDCC. The same composition of the BDCC members is also true in Barangay Bagumbayan and Barangay Palingon.

The richest barangay in Taguig is Western Bicutan with P20,203,411 income for 2003. The barangay with the lowest income of P3,798,426 is Barangay Bambang.

## **10.5 Disaster Management Planning**

### **10.5.1 Concepts and Planning Guidance**

#### **1) Basic Concept**

Emergency response is envisioned in the Rules and Regulations Implementing PD 1566 as generally functioning in a bottom-up manner; that is, emergency operations are primarily coordinated and supervised by the local (LGU and barangay) DCCs. When the situation is beyond the capabilities of these DCCs, the regional and provincial DCCs shall extend assistance. National government ministries including the Armed Forces and the Ministry of Public Works and Highways are to assist the local DCCs whenever possible with such activities as rescue, engineering, and evacuation.

Nevertheless, according to the National Calamities and Disaster Preparedness Plan, responsibility for overall control of emergency operations is exercised by OCD on behalf of the NDCC: “Under this plan, the NDCC shall exercise direction and control, through the OCD, over all emergency operations from the Regional down to the lowest political subdivisions/councils. The Council shall coordinate the department’s support/assistance activities in disaster management through this organizational arrangement. It shall likewise provide top executive management and control over multi-departmental types of disaster-stabilization operations.” iii

Among the most critically important functions in the immediate disaster environment is collecting and evaluating damage assessment information. Damage assessment formats and other official communications are seen as originating with the local DCCs and communicated through their operations centers to the next higher DCC, then on to OCD and the NDCC.

#### **2) PD 1566**

Section 6 of PD 1566 requires planning for disaster operations. First, it provides that a National Disaster and Calamities Preparedness Plan shall be prepared by the Office of Civil Defense for the approval of the President. Then, planning factors and guidelines for national and governmental entities shall conform to the approved national plan, and implementing plans shall be documented, furnished to the NDCC, and revised and updated as necessary.

#### **3) Rules and Regulations Implementing PD 1566**

These implementing Rules and Regulations were promulgated to strengthen the capability to control disasters and to establish a national program for community disaster preparedness. They apply to all governmental ministries, agencies, corporations, and political subdivisions of the country and to the private sector. They define responsibilities and establish procedures for inter-agency coordination and dissemination of information during pre-disaster, disaster, and

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post-disaster phases. The OCD Administrator serves as Executive Officer of the NDCC and is assigned overall responsibility for coordinating the country's disaster preparedness program. Further, the NDCC, through OCD, is to review and evaluate all plans of entities and political subdivisions for compliance with national guidelines.

#### **4) Disaster Manuals for Barangays and Establishments**

The Office of Civil Defense has developed useful guidance in the form of two Disaster Manuals, one for barangays (1988) and one for establishments or institutions (undated). The Barangay Disaster Manual covers the organization and responsibilities of the barangay DCC, a preparedness checklist, preparation of a barangay disaster preparedness plan, and basic disaster countermeasures. In essence, the manual can serve as a "model plan" for preparing for and managing a disaster situation in the barangay. The Manual for Establishments provides similar guidance tailored to public or private companies, corporations, schools and other institutions, hospitals, etc. and is built on the basic concept of "self-protection" augmented as necessary by mutual aid.

#### **5) Chairman's Planning Guidance**

The Secretary of National Defense and Chairman, NDCC, provides guidance to integrating agencies to set the tone for responsive and proactive service to the Filipino people and to set the direction for NDCC operational thrusts in the areas of mitigation, preparedness, response, recovery, and interagency collaboration.

#### **6) Evaluation and Awards Mechanism**

NDCC Memorandum Order No. 12 (1989) establishes a process for annual recognition of outstanding DCCs and NGOs as part of the observance of the Natural Disaster Consciousness Week in July. There are two categories of awards for DCCs, one for planning, organization and training, and the other for operations. Various criteria are cited as the basis for the selections, which are made by Boards of Judges. The City of Marikina and the MMDA are recent awardees.

### **10.5.2 Review of Existing Plans**

#### **1) The National Calamities and Disaster Preparedness Plan**

This plan was first approved on April 21, 1984, as an Annex to the Implementing Rules and Regulations to PD 1566 which was approved on the same date. The current version of the plan was approved on August 24, 1988.

The plan is built around the concept that all available resources, public and private, shall be utilized before asking for assistance from neighboring entities or higher authorities. It encourages self-reliance and self-help and collaboration among local officials, the general public, and private

organizations. The National Plan provides that all tasked agencies and entities are to submit action plans in support of the National Plan, and that inter-agency, multi-sectoral planning, coordination, and operations shall also be conducted.

The plan includes annexes for each of 10 functional areas:

- Communications and warning service
- Emergency transportation service
- Evacuation service
- Rescue and engineering service
- Health service
- Auxiliary fire service
- Police auxiliary service
- Relief service
- Rehabilitation service
- Public information service.

Each annex includes a (a) purpose, (b) concept of operations, (c) organization, (d) responsibilities, (e) tasks, and (f) functional relationships.

The plan outlines the functional relationship between the DCCs and the Government's tasked agencies as follows: (1) The departments and agencies extend support/assistance to the NDCC through OCD, and (2) Their regional offices provide support/assistance to the regional DCC through its DOC, the local offices to the local DCCs at their DOCs, and the same at the barangay level.

**(1) Direction and Control**

In regard to direction and control, the plan (p. 10, Sec. 6, Coordinating Instructions) provides that:

*“When any emergency affect[s] several towns and cities, City Mayors shall place themselves and their manpower and facilities under the operational control of the Provincial Governor for the duration of the emergency.”*

*“The National government exists to support the local government. In time of emergencies and according to their levels of assignments, all national government offices assigned to provinces, cities/municipalities and barangays, shall support the local governments”.*

Further, and in apparent contradiction to the second of the above provisions, the plan (p. 11, Control, A.) provides that



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*“The direction and control of disaster operations at the national level will be exercised by the NDCC through the facilities of the OCD. Direction and control at all other levels will be exercised through their respective Disaster Operations Center.”*

It is significant to note that the annexes also address command and control issues. For instance, to ensure unity of effort in the Health Service, the Chiefs of the Health Services are operationally under the Chairman of the DCC. However, medical, technical and administrative controls still reside in the existing Department of Health organizational structure. For Rescue and Engineering, DILG is responsible for organizing the Rescue and Engineering Service, while local governments are responsible for all rescue and engineering activities within their territories. It also should be noted that Rehabilitation Service is to provide for restoration of morale of persons affected by disasters, providing access to rehousing, employment, and all forms of available assistance.

## **(2) Coordination and Disaster Operations Center (DOC) Operations**

The National Calamities and Disaster Preparedness Plan provides that each DCC shall have staff elements stationed in their operations centers for:

- Intelligence and Disaster Analysis Unit (evaluates information and makes recommendations on allocation of resources)
- Plans and Operations Unit (determines courses of action to be taken and monitors operations)
- Resource Unit (surveys availability and location of resources to meet victims' immediate needs)

Operating or task units are required for:

- Communications and Warning Service
- Transportation Service
- Evacuation Service
- Rescue and Engineering
- Health
- Fire
- Police
- Relief
- Public Information
- Rehabilitation.

There is a separate organizational structure specified for barangay DCCs (11 independent functions reporting to the Assistant Chairman and Chairman).

DILG is responsible, according to the National Plan, for assisting the Local DCCs in establishing their Disaster Operations Center.

**2) The Metropolitan Manila Calamities & Disaster Preparedness Plan (or Emergency Preparedness Plan)**

This plan is intended to provide an integrated system of direction, control, and utilization of resources, to define the roles and tasks of the MMDCC agencies and NGOs that operate in the NCR, and to enhance coordination and cooperation among the concerned agencies. It establishes that the MMDOC shall be staffed on a 24-hour basis and should gather information about a disaster situation and establish contact with the OCD DOC. In a disaster, all members of the MMDCC are to assign Action Officers (from a senior level position, to ensure facility in decision-making) who report to duty in the MMDOC.

The plan establishes several control mechanisms: communication links, reporting requirements and direction and control (exercised by the MMDA Chairman through the MMDCC and, as necessary, through a special control group in the MMDOC). The MMDCC utilizes the facilities, staff and services of the MMDA as its operating arm, with the support of the OCD, NCR. The MMDCC does not have its own budget but rather operates through the member agencies and the local DCCs.

**3) Local Government Plans**

**(1) General Status**

Review of available records on city and municipal plans and programs for disaster preparedness shows their status as follows:

City/Municipality	Disaster Plans and Programs			Year Plan
	Earthquake	Fire	Floods	
Caloocan	yes	yes	Yes	2000
Las Piñas		yes	Yes	1998/2000
Malabon		yes	Yes	2000
Makati	yes	yes	Yes	Various
Mandaluyong		yes	Yes	No date
Manila		yes	Yes	2002
Marikina	yes	yes	Yes	2000
Muntinlupa	yes		Yes	2000
Navotas	yes	yes	Yes	2000
Parañaque	yes	yes	Yes	2000
Pasay		yes	Yes	2000
Pasig			Yes	2002
Pateros			Yes	2000
Quezon		yes	Yes	2000
San Juan	yes	yes	Yes	No date
Taguig		yes	Yes	2000
Valenzuela	yes	yes	Yes	1996/8

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All plans should be updated annually.

## **(2) Review of LGU Emergency Plans and Documents**

### **Caloocan City—CCDCC Disaster Management Plan**

This city plan, dated January to December 2000, provides a good sample of a Local Government Unit's plan in Metro Manila. It includes pre-disaster, during disaster, and post disaster phases, and defines specific outputs (e.g. 100 copies of the Disaster Management Operation Manual reproduced to provide a copy to all members of CCDCC and BDCC), timeframe, persons/agencies responsible, and resource needs (cost and source).

Some of pre-disaster activities are regular programs or projects of the city, e.g. clearing of canals and relocation of squatters from danger areas. The plan also states that earthquake briefings, drills and techniques are conducted at different institutions to enhance awareness in regard to preparation and prevention for unpredicted events like fires and earthquakes. Other planned pre-disaster activities include disaster management training for the organized committees of CCDCC and BDCC and fire brigade, water rescue, EMT training, and public information including orientations and forums in barangays; also earthquake briefings in schools (primary, secondary and tertiary), and establishment of functional communication networks NGOs, PHIVOLCS, MMDA, etc.

As of the date of plan preparation, apparently a place that will serve as the DOC had not yet been identified. Steps to produce the Manual were outlined along with the need to find a sponsor for reproduction of pamphlets, brochures, leaflets for residents.

During the disaster phase, the first step is to convene the CCDCC and BDCC, issue a memo and announcement, and conduct a meeting for deployment of personnel. The Intelligence and Disaster Analysis Team will assess the situation and convey the results to the DOC. This phase seems to concentrate on information reporting and disseminating and distribution of relief, with little reference to search and rescue teams or other operational activities. The post-disaster phase concentrates on verification of information and impacts, reporting, and cleaning of debris from the impacted areas.

An inventory is included in the plan, listing minimal quantities of search and rescue equipment. There's one paramedic ambulance and five others, and five operational and 15 non-operational fire trucks. There is a city health department and Caloocan General Hospital.

The plan identifies 84 barangays that are "ready and prepared to serve the needs of the people in any case of an emergency while 104 barangays need to rehabilitate in order to serve the people in any occurrence of a disaster."

### **City of Las Piñas Disaster Management Plan**

This plan (dated 1998-2001) is based on the following objectives: to prevent and/or minimize loss of lives, and to minimize damage to properties and alleviate suffering of disaster victims by strengthening the government's capacity to respond to those disasters by: strengthening the city and BDCCs, developing skills of personnel and training of task unit members, etc. Under concepts and policies it singles out the spirit of self-help, and mutual assistance is promoted and encouraged between the city and barangay officials and among the barangays and their constituents. The need for drills and exercises is also noted.

The plan lists the tasks (responsibilities) of CDCC, chairman etc., and task units (supplies, security, transportation, communication, warning, rescue, relief, medical, fire, evacuation, and damage control. It includes 10 coordinating instructions. Direction and control are to be exercised by the CDCC through the City DOC and at the barangay level by the BDCC at the BDOC. The CDCC will be established at the office of the Chairman, City Hall, and BDCCs at their barangay centers. It is a five-page plan.

In June 2000 the city submitted to MMDA a public safety plan focused on crime control, anti-terrorism, law enforcement, public health, etc.

### **City of Makati**

The city lists eight disaster plans: bomb threat (June 2000), bulletin on bombing and terrorist acts, the Liberators of Makati DCC (1995), disaster preparedness activities for the 2000 rainy season, action plan on La Niña (1998), city task force on El Niño (1997), SOP No. 98-01 (revised), and addendum for the SOP on preventive measures for intense thunderstorms.

The Mayor's Conference Room is designated as the MCDCC DOC. The Liberators are a task unit of the MCDCC under the SAR function. Staffing is provided by various departments. There are two groups of 271 and 270. There are groups for extrication, technical, firefighting, medical, extrication relieving and support, crowd control and security, debris removal, and social services. Communications linkages and a notification system are outlined.

The SOP is clearly based on rainstorm situations. It includes activation criteria for the DCC based on Public Storm Warning Signal #2 or occurrence of a man-made disaster requiring coordinated response. It is 7 pages and contains generalized operations procedures organized by pre-disaster, emergency, and post-emergency phases, stating who is responsible to take various actions. Most of the phase two actions are ensuring readiness. There is an undated inventory.

In conjunction with the MMEIRS Study Team, the city is developing an Emergency Response Pocket Guide to assist the city in preparing for and responding to any type of emergency.

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### **Municipality of Malabon Integrated Public Order and Security Plan**

The plan (dated 2000) presents security measures (guidelines) for shopping malls and major establishments, including fire drills, police stations, and bomb threat information for the Malabon Health Department and also barangay security measures.

There is also a “profile on disaster preparedness” including flood, fire, and EQ risk maps, MDCC organization chart, logistics inventory for disaster response, evacuation centers, and barangay DCC organization chart and sample of barangay disaster plan (1 page, 5 lines).

The Malabon DCC organization chart shows most of the resources under Plans and Operation. Also there’s Intelligence Analysis and Resources management as the three major sections.

The barangay DCC organization chart shows 11 functional teams/committees (each comprised of one team leader and four members), for: security, supply, transportation, communication, warning, rescue, evacuation, relief, medical, fire, and damage control.

### **Marikina**

The Marikina DCC is organized with the Disaster Action Officer and internal Disaster Coordinator (the City Administrator) directly under the DCC chair and vice-chair and over the 3 areas of: Plans and Operations, Intelligence and Disaster Analysis, and Resources Management. There is no indication of the Disaster Operations Center on the organization chart (see below).

Plans and Operations includes the following groups: rescue and engineering, transportation, health and medical, public safety, fire service, and disaster relief, welfare and rehabilitation. Intelligence and Disaster Analysis includes communication and warning, and public information.

There is a 1998 Executive Order reorganizing the MCDCC, establishing a physical facility known as the CDOC, organizing working committees, etc. 14 barangay captains are on the MCDCC. Descriptions of functions and the agencies involved are included in what might be a separate document.

Additionally, there is the Marikina Calamity and Disaster Preparedness Plan which includes activities for specific disasters, including earthquake, by three phases. The plan is undated. The goals are to provide integrated direction and control, to define roles and responsibilities, and to enhance coordination and cooperation of concerned agencies/offices. The plan states that the city should establish a DOC but doesn’t say where. The earthquake section is ½ page and says that the city DOC shall coordinate with and assist the barangay DCCs and disaster control groups in large public and private establishments in the required operations. Also, the barangay operations center, in cooperation with DILG-NCR and barangay officials, shall organize local citizenry into

volunteer groups for relief operations and to assist in transportation of victims to evacuation centers. The Welfare and Rehabilitation Service of DCDD, in cooperation with various organizations, shall coordinate attention to victims in the form of low cost housing loans. The section on typhoon/flood/storm surge/tsunami is detailed. There are also sections on fire, power failure, water/air disaster, mass action, and epidemic/pollution.

Barangay DCCs and large organizations, public and private, are to prepare their own disaster preparedness plans with the OCD published manuals. The national government exists to support the LGUs in time of emergencies; all heads of national government agencies including government corporations in Marikina are considered ex officio-staff officials of CDCC and as such should coordinate with and support local government and barangays before, during, and after. There are complete radio call signs for 225 radio users, an inventory of equipment, manpower, supplies and materials, and communications, including 8 emergency ambulances and 7 fire trucks. The training received by each of the 34 Rescue 161 members is noted.

#### **Mandaluyong City Emergency Preparedness Plan**

This plan is comprised of five pages of description of the city, its formation and background. The only portion directly referring to emergency preparedness and response tasks and responsibilities states that as far as emergency response logistics are concerned, they have coordinated with construction companies and have been assured they will lend heavy equipment during calamities.

#### **Manila Emergency Preparedness Plan**

A March 2000 status report on the plan describes programs and projects scheduled for implementation, including: organization of the CDCC, city emergency response group, BDCC, Barangay emergency response brigade; training; the enactment of an emergency city ordinance; formulation of procedural checklists for disasters and emergencies; construction and equipping of a DOC; monitoring system, and stockpiling. A brief inventory shows considerable fire resources (12 trucks, 4 snorkel trucks, 6 new trucks, 60 fire volunteer groups on call, 80 barangays with firefighting equip, and some chemicals for hazardous materials fires). Also, there are 3 radio groups and 4 city-owned hospitals with ambulances.

#### **Multinlupa City Disaster Preparedness Plan**

The MCDCC was created by Mayor's Executive Order. The MCDCC is organized into 17 task forces, all reporting to the DOC (under the action officer). The staff functions (intelligence and analysis, planning, and resources) report to the assistant chair (Chief of Police). There also is a PIO reporting to the DOC. The DOC location is specified and has some equipment. This 2000

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plan is concise and includes such concepts as action planning (with attached format), reporting formats, and specified hazard prone areas.

### **Navotas Municipal Disaster Plan**

The Navotas DCC is organized under the action officer, with three areas: resources management, plans and operations, and intelligence analysis, with 7 functions under plans and operations. The action officer is the acting municipal administrator. The DCC was reorganized by Executive Order in 2000.

The plan lists tasks by organization and coordinating instructions in a way that is familiar to other plans. There's a 2-page flood plan and 3-page earthquake preparedness plan including: rationale; objectives; strategy of implementation (concepts, organization and responsibilities, tasks, coordinating instructions, administration and control, and logistical support. Also, an "action plan on La Nina" follows what may be a standard format in two pages.

### **Paranaque City Operations Plan "Kaligtasan"**

This plan references an Executive Order dated July 1999. The plan is five pages with annexes including: suggested task list during specific emergency situations (1 page each, including one for earthquake); implementing plan format, and disaster (situation) report forms.

The organization chart shows three action officers all over the nine functional areas, with the Operations Center to the side under the action officers.

### **Pasay City Implementing Plan: Paghahanda**

This plan references the Pasay City Disaster Management Manual and a memo from the MMDCC chairman, 26 May 2000, subject OPLAN: Metro Alert. The plan is three pages and includes: objective, situation, concept of implementation, coordinating instructions, reporting system, and tasking (see list of PCDCC members).

The Pasay City Disaster Management Manual is designed to provide general public information on what to do before, during and after disasters and calamities, as well as a quick and easy reference on actions to be taken by CDCC and others. The Manual was prepared by an inter-agency technical working group in consultation with government agencies and NGOs. It is 11 pages, 6 of which are for the public, and then 26 pages of annexes including a media annex (directory), funeral parlors directory too. There is a matrix of activities with who is responsible, organized by pre-disaster phase, etc. This plan has a nice matrix (not the standard format; simpler, easy to follow) and useful information for citizens. The 1995 Pasay City Disaster Ordinance established the CDCC functions and responsibilities.

### **Pasig City Calamities & Disaster Preparedness and Management Plan**

The PCDDC was reorganized by Memorandum Order in May, 2002, by the Mayor. The 24-hour Pasig Action Line will serve as Operation Center until the PCDC Secretariat becomes operational. The plan includes goals and objectives, assumptions, preparations, coordination, and control. There is one page of PCDDC organization and functions and other pages of other groups and organizations. It includes an inventory, directories, and reporting format.

### **Pateros Municipality Contingency Plan for Disaster Management**

This plan is two pages in a matrix format. It includes activities broken down into strategies, with six pre-disaster activities, one disaster activity, and one post-disaster activity. It is in the same format as the Navotas plan. It includes stress debriefing as a strategy during the disaster period.

### **Quezon City**

The Quezon City plan is dated June 2000 and is an update to the Quezon City “Implan” by Executive Order No 13, Series of 1993. The plan is six pages and includes tasks by functional group, including who is the lead and who is responsible for support. There is also a two-page contingency plan against bombing incidents and a six-page contingency plan against terrorism. A directory and list of resources are included.

### **San Juan**

This undated, untitled plan is in matrix format by phase but it is almost entirely comprised of pre-emergency activities.

Taguig Municipality Disaster Contingency Plan, 2000

The Taguig Plan is a security document, prepared by the Headquarters Taguig Police Station.

### **Valenzuela Municipality**

An Executive Order in 1998 amends the composition of the Municipal DCC and establishes the standard three staff teams. It provides names on the nine operational teams.

The Valenzuela Municipal DCC Earthquake Preparedness Plan 1996 OPLAN LINDOL is in a similar format like several other plans, including:

- References
- Rationale
- Objectives (general and specific)
- Strategy of implementation including concept, organization, responsibilities, and tasks
- Coordinating instructions



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- Administration and control
  - Logistical support
  - Implementing clause (when it takes effect)
  - Signature of mayor

There is also an action plan on La Niña in same matrix format, as well as a typhoon and flood preparedness plan.

### **Summary**

While all the 13 cities and 4 municipalities in Metropolitan Manila Area have their own respective plans and programs for disaster mitigation, most have not been revised for several years and should be made current. Many of the city and municipal disaster plans and programs are focused more on disasters and emergencies likely to be caused by fire or floods, while only 5 of the 13 cities and 2 of 4 municipalities specifically address potential disasters triggered by an earthquake. In most of those cases, greater detail in regard to earthquake-induced impacts is needed. Moreover, many of these plans and programs could be strengthened through city or municipal ordinances which formally affix responsibilities with certain entities and individuals.

## **4) Contingency Plans for Earthquake**

### **(1) The Valley Faultline Contingency Plan**

This plan is intended to deal with a destructive earthquake in the Metro Manila area and is based on the policies and concepts of the NDCC Calamities and Disaster Preparedness Plan of 1988. It covers short-range aspects of earthquake events, stating that *“the aspects of rehabilitation, reconstruction, relocation and resettlement can only be attended to when the situation shall have stabilized and these are better handled by the concerned agencies as part of their usual primary responsibilities.”* (p. 1)

Overall direction and control of all emergency operations at all levels is exercised by the NDCC through the OCD. The MMDCC, which is responsible for coordinating the activities of the local DCCs and task forces through its “Metro Manila Task Force Valley,” is assisted by four Work Groups which serve as its implementing arms:.

- 1) Prediction and Preparedness Group
- 2) Rescue and Evacuation Group
- 3) Relief Operations Group
- 4) Public Information Group

The chair and members of each group are specified. The operational strategy of graduated response is to be used, in which response measures correspond to the magnitude of damage and expand and contract as warranted by the situation.

In addition to the Work Groups, government agencies are expected to carry out their normal emergency responsibilities as outlined in the plan. The plan is undated but appears to have been approved by virtue of NDCC Memorandum Order No. 38, Series of 1991).

**(2) The Metro Manila Earthquake Disaster Preparedness and Response Plan (aka Earthquake Preparedness Plan)**

This plan parallels the NDCC's Valley Faultline Contingency Plan at the Metro Manila level. It places the MMDCC under the supervision of the NDCC, and makes the MMDCC responsible for its implementation and the MMDCC Chairman as the person primarily responsible for orchestrating activities before, during and after the emergency. The local executives (mayors) of cities and municipalities within MM, as Chairmen of their DCCs, are responsible for undertaking DM activities relevant to the plan in their jurisdictions. Agency/entity responsibilities in regard to the programs and activities listed in the plan are presented in a task matrix (which does not indicate who is the lead for the activity). This plan was dated for approval in October 1999 by the MMDCC. It is currently being reviewed and updated by MMDA staff.

## **10.6 Calamity Response Measures**

### **10.6.1 Establishment of A Special Facility for the Importation and Donation of Relief Goods and Equipment in Calamity-Stricken Areas**

Presidential Issuances No. 36 s-1992 as amended by PMO No. 42, s-1997 defines the establishment of a special facility for the importation and donation of relief goods and equipment in calamity-stricken areas. Requirements for availment of importation and donation of food, clothing, medicines and equipment under this special facility are:

- Calamity area declaration either by the President of the Philippines or local Sanggunian pursuant to RA 8185.
- For relief and rehabilitation programs of the Government in areas declared under a state of calamity.
- The importations and donations should be in accordance with Sec 105 of Tariff, and Customs Code and pertinent provisions of the GAA on national internal revenue taxes and import duties of the national and local government agencies.

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- Importations, which are considered as importations by Office of the President , shall be consigned to the latter.
  - Favorable endorsement by the following departments:
    - DSWD - Relief clothing and Food
    - DOH - Medicine
    - DND - Rehabilitation Equipment
    - With respect to importation and donation of rehabilitation equipment, prior approval by the President is needed before the necessary clearances are issued.
  - Clearance from the Office of the President.

### **10.6.2 Calamity Fund Management**

NDCC Issuances Memo Order No. 02, s-1999 defines revised policies and procedures on calamity fund (NCF) management. The basis for NDCC issuance Memorandum Order No. 02 series of 1999 is RA 8185, which was approved June 11, 1996 repealing some sections of the Local Government Code (RA 7160). Policies in the use of the NCF are

- The NCF can be used for the following purposes, namely:
  - Aid, relief, rehabilitation and reconstruction and other works or services in connection with calamities which may occur during the budget year or previous years past two (2) plans;
  - Pre-disaster activities such as training; and
  - Capital expenditures such as purchase of equipment for pre-disaster operations and rehabilitation.
- NCF shall be used in the following order of priority:
  - Priority I - For urgent and emergency relief operations and emergency repair and rehabilitation of vital public infrastructures and lifelines damaged by calamities occurring within the budget year, e.g. hospitals, schools, major roads and bridges, and farm-to-market roads.
  - Priority II - For repair, rehabilitation and reconstruction of other damaged public infrastructures which are not emergency in nature but are necessary for disaster mitigation.

- Priority III - For pre-disaster activities outside their regular budgets of line agencies and proposed capital expenditures for pre-disaster operation.
- NCF can not be used for the following:

Repair/rehabilitation of government buildings damaged by fire can not be funded by the NDC. e.g. hospitals, school buildings, capitol buildings and public markets. These are supposed to be covered by the fire insurance.

Relief and rehabilitation requirements for specific calamities with specific appropriations under special laws, except when the appropriations have been fully expended or utilized.
- Release of Quick Response Funds to agencies concerned is subject to the calamity fund provisions of the annual GAA.
- Putting up of a local counterpart fund by LGUs as follows:
  - 1st class - - - - - 50% of the total project cost
  - 2nd class - - - - - 40% of the total project cost
  - 3rd class - - - - - 35% of the total project cost
  - 4th class - - - - - 30% of the total project cost
  - 5th & 6th class - - -exempted but request should not exceed P3 Million

### **10.6.3 Policies, Procedures and Criteria for Calamity Area Declaration.**

NDCC Issuances Memo Order No. 04, s-1998 – Amended Policies, Procedures and Criteria for Calamity Area Declaration defines the followings.

#### **1) Procedures for Calamity Area Declaration**

##### **(1) By the President of the Philippines**

When two or more provinces or chartered cities are affected by a calamity, the National Disaster Coordinating Council shall recommend to the President the declaration of a state of calamity over these areas, including the release of calamity funds, if necessary, and implementation of appropriate remedial measures.

##### **(2) BY LGUs**

- Whenever a disaster or calamity occurs, the local Disaster Coordinating Council (DCC) shall conduct a survey of the affected area within 24 hours upon the impact to determine the extent of casualties and damages brought about by the calamity.

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- Based on the damage assessment and evaluation of the DCC, the LCE shall recommend to the local Sanggunian the declaration of a state of calamity in the disaster area, together with appropriate disaster mitigation measures.
  - Within twenty four (24) hours from the occurrence of the calamity and acting on the basis of the recommendation of the LCE, the local Sanggunian concerned shall immediately convene and pass a Resolution declaring their area under a state of calamity and adopt measures to protect the lives and properties in the area.
  - When two or more barangays are affected by a disaster, the Sangguniang Bayan or Panlungsod, upon the recommendation of the Municipality/City Mayor, may declare the entire municipality or city under a state of calamity. The Sanggunian Resolution embodying the declaration need not be reviewed or approved by the Sangguniang Panlalawigan.
  - When two or more municipalities or cities are affected by a disaster, the Sangguniang Panlalawigan, upon the recommendation of the Provincial Governor, may declare the entire province or a portion thereof under a state of calamity. The Sangguniang bayan/Sangguniang Panlungsod of the affected town or city need not declare their areas as calamity areas.
  - The concerned Sanggunian shall immediately furnish their respective RDCCs and the NDCC a copy of the Sanggunian resolution embodying the calamity area declaration.

## **2) Criteria for Calamity Area Declaration**

At least two or more of the following conditions are present in the affected areas and lasting for at least four (4) days.

- 20% of the population are affected and in need of assistance, or 20% of the dwelling units have been destroyed.
- A great number or at least 40% of the means of livelihood are destroyed (E.g. bancas, fishing boats, vehicles)
- Major roads and bridges are destroyed and impassable thus disrupting the flow of transport and commerce.
- Widespread destruction of fishponds, crops, poultry and livestock and other agricultural products.
- Disruption of lifelines such as electricity, potable water system, transport system, communications, and other related systems, except for highly urbanized areas where restoration of the above lifelines cannot be made within twenty-four (24) hours.

In case of epidemics or outbreak of disease, an area may be declared under a state of calamity based on the following:

- There is an occurrence of an unusual (more than the previously expected) number of cases of a disaster in a given area or among a specific group of people over a particular period of time. To determine whether the number is more than the expected, the number should be compared with the number of cases during the past weeks or months or a comparable period during the last few years (at least 5 years).
- There is a "clustering" of cases in a given area over a particular time.

### **3) Duration of Calamity Area Declaration**

Duration of calamity area declaration is one year from the effectivity of the declaration. But when the effects of the disaster are recurring or protracted in which case, the declaration shall be a continuing one. Once 8.5% of the repair and rehabilitation works and services have been restored, declaration of a state of calamity may be terminated or lifted by the President of the Philippines or the local Sanggunian.

### **4) Remedial Measures that may be undertaken upon the Declaration of a State of Calamity**

- Automatic imposition of price control of prime commodities in areas declared under a state of calamity by the President of the Philippines unless declared otherwise (Sec. 6, RA 7851 or the Price Act). Effectivity of price control is good for sixty (60) days;
- Programming/reprogramming of funds for the repair and safety upgrading of public infrastructure and facilities;
- Allowing the granting or restructuring of loans by government financing or lending institutions to bonafide victims of the disaster in accordance with their respective charters;
- The same deferment or moratorium shall be granted to corporate borrowers of aforesaid government credit institutions whose operations are seriously impaired by the calamity.
- Release of national calamity funds to agencies involved in relief operations and rehabilitation and restoration of damaged infrastructures as well as to affected LGUs;
- Release of Local Calamity Funds within the affected LGU or other areas affected by a disaster or calamity for relief, rehabilitation, reconstruction and other works or services.

## **10.6.4 Policies and Procedures on the Provision of Financial Assistance to Victims of Disasters**

NDCC Issuances Memo Order No. 13, s-1998 - Amended Policies and Procedures on the Provision of Financial Assistance to Victims of Disasters defines the following:

Coverage of this treatment is limited only disaster victims who die or get injured during the occurrence of natural disasters. Victims of man-made disasters, such as fires, vehicular accidents, grenade/bombing incidents, armed conflicts, and air/sea mishaps, are not included unless directed or approved by the President of the Philippines upon the recommendations, NDCC.

Amount of Financial Assistance is

1. P10,000.00 - For Dead Victims
2. P 5,000.00 - For Injured Victims

Validity of Claims - Within one year from the disaster occurrence.

## **10.7 Analysis of Past Assessments, Surveys and Studies**

### **10.7.1 Lessons Learned from the Luzon Earthquake**

#### **1) NDCC Final Report on the July 16, 1990 Earthquake**

The NDCC's Final Report (dated October 22, 1990) on the July 17, 1990 Earthquake, which resulted in 1,283 deaths and 120,021 homeless, found that while the legal bases, structures, procedures and systems for the national disaster preparedness and prevention program are in place, certain deficiencies became apparent during the disaster operations. The report also presented the following lessons drawn from the disaster:

- The poor condition of the seismic monitoring and early warning equipment of the PHIVOLCS
- The laxity in the implementation of the National Building Code as well as other national laws and ordinances on land zoning
- Proper education about earthquakes must be conducted to raise the level of awareness throughout the country.
- LGUs through their DCCs should also be urged to enhance their response capabilities, especially in terms of rescue, evacuation, relief and medical resources and equipment.
- Steps must be taken to ensure the smooth and efficient receipt and delivery of donations from abroad.
- The absence of a reliable and effective communications system delayed the immediate reaction from concerned agencies. Need to procure equipment and to harness all existing communications facilities for any future disaster.

Various actions have been and are being taken to correct these problems. Nevertheless, at a MMEIRS workshop in 2002, OCD expressed the following issues and concerns arising out of the experience of NDCC Member Agencies' response to the Luzon Earthquake:

- 1) Failure of some local DCCs to react and take charge of the situation
- 2) Lack of coordination between and among NDCC member agencies and NGOs especially in the allocation and distribution of relief goods which resulted in the slow or non-delivery of assistance in some affected areas
- 3) Need for an effective quick response rescue/recovery capability
- 4) Need for the pre-inventory of rescue capability of private firms and harnessing them for relief operations

- 5) Need for the establishment of effective management of relief centers and staging areas
- 6) Need to decentralize decision-making on rescue, recovery and relief management to tasked agencies
- 7) Need for back up communications system
- 8) Need for immediate damage assessment information
- 9) Lack of accurate knowledge of alternative routes to isolated areas
- 10) Need to coordinate and facilitate entry of foreign assistance
- 11) Low level of public awareness and preparedness on geological hazards

The NDCC's recommendations, based on the above findings, are:

- 1) Revitalization/reorganization and retraining of local NDCC staff at all levels
- 2) Preparation of functional disaster plan by the local government
- 3) Strict implementation of 2% budgetary reserves for disaster operations under PD477, as well as the allocation of funds for disaster preparedness under PD 1566
- 4) Formation of a special survey team for immediate dispatch in affected areas where communication lines have been cut off
- 5) Acquisition of back up communication system
- 6) Update the National Calamities and Disaster Preparedness Plan to include public information
- 7) Spell out policy on decentralization with the LCEs taking charge
- 8) Review of SOPs and decentralization in the acquisition and distribution of relief goods
- 9) Drawing up of comprehensive integrated emergency relief plans
- 10) Provision of timely advisories to the public and private sector regarding relief needs and road conditions
- 11) Conduct of intensified information campaign on geological hazards.

### **10.7.2 Findings of the OCD-sponsored Earthquake Tabletop Exercise**

Approximately 80 participants from the NDCC agencies, LGUs, other stakeholders, and some NGOs, participated in a tabletop based on a 7.5 M earthquake resulting in 30,000 deaths and 60,000 injuries requiring hospitalization. The overwhelming assessment was that it was clear that with our resources, we cannot possibly cope with the effects of such a major earthquake. A second conclusion by the leaders was that they need more of this kind of exercise.

The recommendations were limited to the response phase. As provided orally by the operations chief of OCD, the participants emphasized that the resources and capabilities in the NCR need to be strengthened for:

- 1) Rapid damage and needs assessment
- 2) Search and rescue, especially for collapsed structures
- 3) Fire suppression



- 4) Emergency medical service
- 5) Evacuation and relief
- 6) Command and control

It is noted that PHIVOLCS is currently developing its damage assessment capability, initiating a “Rapid Earthquake Damage Assessment System” through which it could issue an immediate assessment of the various seismic hazards (e.g. ground shaking, liquefaction, landslides, tsunami) that may occur, where they may occur, and the elements at risk in those areas. Also, the Philippine Association of Civil Engineers and the Association of Structural Engineers of the Philippines are working with OCD on rapid damage assessment procedures. Local capability, however, in this and the other areas needs to be developed or enhanced.

### **10.7.3 Findings of the First MMEIRS Workshop**

At the first MMEIRS Workshop held on November 15, 2002, a questionnaire regarding “what measures should be taken to prepare Metro Manila for a large-magnitude earthquake like the 1990 Luzon Earthquake?” was completed and discussed by all workshop participants. The results revealed diverse views regarding:

- 1) perceptions of the earthquake risk
- 2) steps which have been taken by local, regional, and national governments and others to mitigate the risk
- 3) what still needs to be done
- 4) why these actions have not been undertaken, and
- 5) what are the ideal actions to take assuming the availability of funding.

Analysis of the workshop participants’ comments provides many insights into key stakeholder views on earthquake risk and measures to reduce risk.

A wide range of physical or structural and social (non-structural) impacts of major earthquakes are recognized and expected, such as:

- 1) failures of infrastructure including power, water supply, communications, and mass transport
- 2) environmental damage
- 3) dislocations
- 4) social and economic disruption, and
- 5) psychological trauma.

Earthquake secondary effects such as hazardous materials releases (in particular, collapse of tanks or pipelines at the oil depot), fires, liquefaction, and tsunami were also noted.

It is anticipated that emergency response and recovery efforts will be impeded by such factors as:

- 1) communications systems failures
- 2) inadequate emergency plans and procedures
- 3) insufficient trained personnel for search and rescue and other critical tasks
- 4) poorly organized and/or unprepared coordinating councils (DCCs), and
- 5) disruption to systems for management and dissemination of information.

The organizations represented at the workshop (primarily representatives of local, regional and national governmental entities) collectively have taken numerous steps to deal with earthquake and other risk.

Several significant themes recur throughout the responses.

- 1) The need for better or closer collaboration between scientists and their studies and the government and citizens, in order to get risk information understood and used and to get risk information incorporated into land use plans.
- 2) The need to strengthen the disaster coordinating committees (DCCs) was frequently cited.
- 3) Other issues include the need for political will, improved coordination, and implementation.

Other key ideas are to:

- 1) Integrate national and local disaster management efforts
- 2) Establish a separate, dedicated group to conduct simulations
- 3) Develop capacity and procedures for rapid assessment of building and lifeline damage and structural evaluation
- 4) Establish a national media plan for disaster management
- 5) Evaluate past activities and identify and improve weaknesses
- 6) Define and immediately launch concrete actions
- 7) Disaster management plans to be an integral part of local and MMDA Development Plans.

#### **10.7.4 “The Philippine Disaster Management Story: Issues and Challenges”**

In this study, Dr. Clarita Carlos reports that the following issues and challenges were raised in her interviews during 2001 with officials from various institutions related to disaster management.

- 1) Coordination, leadership and command:
  - i) Need for inter-agency coordination
  - ii) Lack of unity of command and understanding about who is in charge (Since agencies are used to working on their own, they do not know others’ capabilities; also “unnecessary political interventions” can be a problem)
- 2) Logistics and resources
  - i) Problem of limited resources, in particular for communications, transportation, and equipment and supplies for emergency medical services.

- 3) Human resource development
  - i) Guidelines needed for rescue groups
  - ii) Standardization needed for emergency medical service
  - iii) Training opportunities should be organized rather than uncoordinated
  - iv) Lessons learned need to be systematically documented
  - v) A manual on disasters is needed for all concerned agencies
- 4) Other observations
  - i) Need for an adequate system for quick situation and needs assessment and monitoring
  - ii) Strong local leadership and coordination needed for relief
  - iii) Need to encourage and mobilize local governments to organize, train and equip their own coordinating councils
  - iv) Need to develop the Incident Command System to facilitate clear roles and responsibilities.

Among her conclusions, Dr. Carlos states that: *“Even if formal structures for managing disasters were already established, the Philippine disaster management system is still continuously being confronted with new challenges and concerns. This condition requires anticipatory measures and strategies rather than reactionary ones to further facilitate our shift from the culture of just concentrating on response during actual disasters and to pay attention to equally significant aspects that require close consideration like preparedness, mitigation, recovery and rehabilitation.”<sup>iv</sup>*

Dr. Carlos identifies five critical areas for improvement in order to strengthen disaster management in the country:

- 1) Measures for preparedness and mitigation, to reduce losses
- 2) Hazard assessments and maps
- 3) Political will and advocacy campaign
- 4) Monitoring and forecasting capability of local community and emergency managers
- 5) Develop the Incident Command System to facilitate clear roles and responsibilities

### **10.7.5 “An Assessment of Disaster Preparedness in the NCR/Metro Manila Area”**

In 1999 Dr. Nestor N. Pilar conducted a study to assess the preparedness of selected cities and municipalities in the metropolitan region to cope with the threats posed by the La Nina phenomenon. Preparedness was defined as action to minimize loss of life and damage and to organize/facilitate rescue, relief and rehabilitation efforts. Dr. Pilar established two sets of elements or factors as the criteria for his evaluation: (1) the managerial processes of planning,

organizing, staffing, and controlling, and (2) operational tasks such as mobilization, logistics, and security.

Planning and organizing, he reported, appear to be in place, citing various plans and the organizing of the DCCs at various levels. He concluded that: *“There are existing plans. Organizational schemes have been developed. What remains unclear is whether these organizations can in fact come to life when needed, manned at appropriate levels down to the barangays, and supported with budgets.”*

In a presentation entitled “Rethinking Disaster Management” (2000), Dr. Pilar noted that the national plan was last approved in 1988, it contains inconsistencies in the membership of the NDCC, community organizations are underrepresented, and it does not reflect 1990s legislation including the Local Government Code and creation of the MMDA, which have altered the structures and functions of government. He suggests that research should be conducted into whether a revised plan should pursue a new concept and how to address the gaps in organization and management.

### **10.7.6 GESI Emergency Response Questionnaire**

The Global Earthquake Safety Initiative (GESI) project was conducted jointly by the United Nations Center for Regional Development in Japan and GeoHazards International, an international non-governmental organization. The GESI methodology synthesized technical information on a wide variety of subjects related to urban seismic risk, including:

- 1) Land use planning capacity
- 2) City-wide emergency response capacity
- 3) Emergency medical care capacity
- 4) Firefighting capacity
- 5) Building inventory and vulnerability
- 6) Frequency and size of potential earthquakes, and soil conditions
- 7) Likelihood of post-earthquake fires and landslides.

Some questionnaire responses from the representative cities of Las Piñas and Makati provide insights into disaster management in Metropolitan Manila.

#### **Las Piñas**

In Las Piñas, the Mayor’s Executive Order 09-00 Series of 2000, which is known as the Calamities and Disaster Preparedness Plan of the City Government of Las Piñas, has been disseminated to all barangay chairmen and public schools (elementary and secondary); however, not all agencies conduct training for employees. The plan does not specifically address earthquake, but it clearly defines functions, and the City Fire Dept takes the lead role in

emergency operations in event of fire and earthquake. The city does not have a central command room, but it does have 75 Fire Department members who are trained for search and rescue and 65 members of armed forces reservists experienced in search and rescue. There are earthquake drills in all public and some private schools.

### **Makati**

Makati has a detailed emergency response plan which addresses earthquake and other disasters requiring rescue. The Alert Plan of the MMDCC can activate its mechanism for mutual assistance from nearby cities, and the plan for rescue provides for inter-agency coordination. The Plan provided for assessment of damaged buildings by the Engineering Department not only after an earthquake but they also conduct such assessments as part of their normal responsibilities, even before any disaster. Evacuation procedures for school children and employees are practiced. A disaster operations center has been designated but a permanent command room in an earthquake resistant building had yet to be set-up. The Makati Youth Emergency Rescue Unit (MAYERT) has 35 personnel trained in search and rescue. Of special interest is Makati's plan for conducting rescue operations in collapsed buildings due to earthquake or other disaster.

### **10.7.7 Preparedness for Earthquake and Terrorism in Makati City**

An action planning exercise at the "Round Table Discussion on Preparedness for Earthquake and Terrorism in Makati City" in February 2002 produced the following recommendations:

#### Communications

- Widen dissemination of plans (through communications plan)
- Establish emergency operation center (like a communication center)
- Establish incident command system
- Communication should be centralized

#### Build/enhance relationship between government and private sector

- Building relations between and among government and private groups
- Coordination
- Vigilance
- Resources
- Trust and confidence to the police
- Representative from private sector to MDCC
- Participation of private sector in disaster preparedness
- Strengthen LGU--private sector partnership
- Create NGO--Government Desk
- Continuous coordination/dialoguing between government and private sector

Sharing of resources

Sharing of resources within private and government sectors  
Response capabilities (i.e. fire trucks, trained personnel, etc.)  
Resource inventory

Training and education

Training and orientation  
Enhancing training and education as preventive measures  
Staging annual/semi-annual conventions for development plans of CNDR  
Vulnerability assessment  
Awareness campaign of all levels: schools and establishments  
Volunteerism, i.e. stress debriefers

Define guidelines/policies

Effective and acceptable command and control  
Long term plans  
Define protocols

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<sup>i</sup> Sosmeña, p. 1.

<sup>ii</sup> Congress of the Philippines, “Republic Act No. 7924,” Sec. 1, Declaration of Policy, July 1994.

<sup>iii</sup> National Calamities and Disaster Preparedness Plan, p. 1.

<sup>iv</sup> Carlos, pp. 120-121.

<sup>v</sup> Pilar, p. 7.