JAPAN INTERNATIONAL COOPERATION AGENCY

THE REPUBLIC OF THE PHILIPPINES

THE STUDY
ON
PROGRAM FORMULATION
IN DISASTER MITIGATION SECTOR
IN THE PHILIPPINES

FINAL REPORT
(SUMMARY)

DECEMBER 2004

Nippon Koei Co., Ltd.

OYO International Corporation

COMPOSITION OF REPORT

1. Main Report (Japanese)	1 Volume
2. Summary (Japanese)	1 Volume
3. Summary (English)	1 Volume

Exchange Rate

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US $ 1.0 = Yen 110.0

As of October 1, 2004

PREFACE

The Government of Japan formulated “Country Assistance Plan for the Philippines (2000)” and set directions of its assistance in accordance with the “Medium-Term Philippine Development Plan”, which was formulated by the government of the Philippines as a roadmap of nation-building. And “Promotion of Environment Conservation and Disaster Prevention” was selected as one of the priority issues to be solved.

Up to now, Japan International Cooperation Agency (JICA) has implemented disaster mitigation cooperation in the Philippines with the objective of disaster mitigation capability building. However, in order to further strengthen its capability, JICA will need to reconsider our future cooperation based on the result of cooperation implemented so far, while taking account of collaboration among various types of cooperation modalities and with other donors.

Therefore, JICA decided to conduct the Study on Program Formulation in Disaster Mitigation Sector in the Republic of the Philippines.

JICA selected and dispatched a study team, headed by Yoshihiro Motoki of Nippon Koei Co., Ltd., consisted of Nippon Koei Co., Ltd. and OYO International Corporation between September 2004 and December 2004. The team held discussions and interviews with the officials and organizations concerned of the Philippines and Japan and made a comprehensive analysis of data including statistics and indicators, current situations and issues extracted though workshops, the result of field surveys. Upon returning to Japan, the team conducted further studies and prepared this final report proposing the team’s ideas on development issues, the drafts of future direction of cooperation and cooperation programs. I believe that this report can be utilized as one of the references for considering JICA’s possible future cooperation in disaster mitigation sector in the Philippines. I expect that this report will be a basis for program formulation and project formulation.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of the Philippines for thief close cooperation extended to the team.

December, 2004

Eiryo SUMIDA
Vice-President
Japan International Cooperation Agency

December 2004

Mr. Eiryo Sumida
President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

It is a great pleasure that we submit herewith the Final Report of the "Study on Program Formulation of Disaster Mitigation Sector in the Philippines". This Report describes the results of the study focusing flood and debris disaster and earthquake disaster sectors, of which damage is significantly huge among various natural disasters in the country.

This study extracted issues for cooperation, which are targeted year 2020, based on the achievements of past projects in disaster mitigation sector, requirement of the Philippine side and current trend of international agencies, etc. Then, priority issues which should be solved in coming five years (from 2005 to 2010), were selected and Cooperation Programs (Draft) were recommended by each sector. The Report consists of three volumes, namely, Main Report, Summary in both Japanese and English.

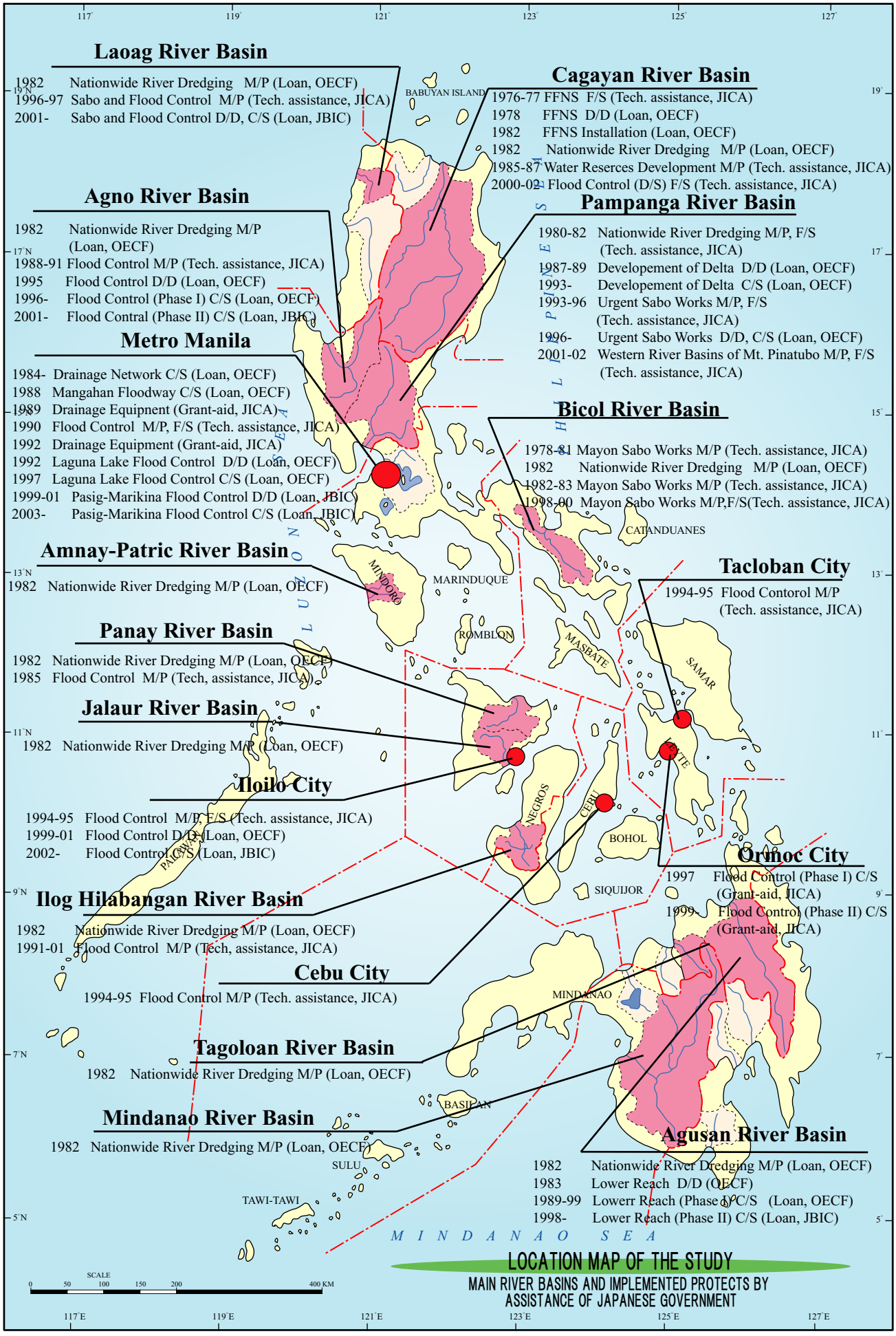
This Report is a document for recommendation prepared based on the long-term experiences in the same field of the Joint Venture composed of Nippon Koei Co., Ltd. (Flood and Debris Disaster Sector) and OYO International Corporation (Earthquake Disaster Sector) and results of field survey, etc. This Report is one of references to decide future direction of cooperation in disaster mitigation sector in the Philippines. Through a series of discussions with related agencies of the Japanese Government and concerned personnel of your Agency, etc., and considering requirement of the Philippine side, it is desired that the cooperation programs will be formulated in disaster mitigation sector.

Upon submission of this Report, we wish to express our deepest acknowledgement to your Agency, Ministry of Foreign Affairs, Japan Bank for International Cooperation (JBIC), Embassy of Japan in the Philippines, experts dispatched by your Agency to the Philippines and also to the personnel of related agencies of the Government of the Philippines for their kind cooperation and advice extended to us throughout the study period.

In November 2004, serious damage has hit in mainly eastern Luzon caused by flood and debris flow. We sincerely hope that the study results would contribute to enhancement of disaster mitigation capability of the Philippines, social and economic development and improvement of welfare conditions in the future.

Very truly yours

Yoshihiro Motoki
Team Leader
The Study on Program Formulation of
Disaster Mitigation in the Philippines
The Joint Venture of
Nippon Koei Co., Ltd. and
OYO International Corporation


Laoag River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
1996-97 Sabo and Flood Control M/P (Tech. assistance, JICA)
2001- Sabo and Flood Control D/D, C/S (Loan, JBIC)
Agno River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
1988-91 Flood Control M/P (Tech. assistance, JICA)
1995 Flood Control D/D (Loan, OECF)
1996- Flood Control (Phase I) C/S (Loan, OECF)
2001- Flood Contral (Phase II) C/S (Loan, JBIC)
Metro Manila
1984- Drainage Network C/S (Loan, OECF)
1988 Mangahan Floodway C/S (Loan, OECF)
1989 Drainage Equipnent (Grant-aid, JICA)
1990 Flood Control M/P, F/S (Tech. assistance, JICA)
1992 Drainage Equipment (Grant-aid, JICA)
1992 Laguna Lake Flood Control D/D (Loan, OECF)
1997 Laguna Lake Flood Control C/S (Loan, OECF)
1999-01 Pasig-Marikina Flood Control D/D (Loan, JBIC)
2003- Pasig-Marikina Flood Control C/S (Loan, JBIC)
Amnay-Patric River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
Panay River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
1985 Flood Control M/P (Tech, assistance, JICA)
Jalaur River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
Iloilo City
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1999-01 Flood Control D/D (Loan, OECF)
2002- Flood Control C/S (Loan, JBIC)
Ilog Hilabangan River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
1991-01 Flood Control M/P (Tech, assistance, JICA)
Cebu City
1994-95 Flood Control M/P (Tech. assistance, JICA)
Tagoloan River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
Mindanao River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
Cagayan River Basin
1976-77 FFNS F/S (Tech. assistance, JICA)
1978 FFNS D/D (Loan, OECF)
1982 FFNS Installation (Loan, OECF)
1982 Nationwide River Dredging M/P (Loan, OECF)
1985-87 Water Reserces Development M/P (Tech. assistance, JICA)
2000-02 Flood Control (D/S) F/S (Tech. assistance, JICA)
Pampanga River Basin
1980-82 Nationwide River Dredging M/P, F/S (Tech. assistance, JICA)
1987-89 Developement of Delta D/D (Loan, OECF)
1993- Developement of Delta C/S (Loan, OECF)
1993-96 Urgent Sabo Works M/P, F/S (Tech. assistance, JICA)
1996- Urgent Sabo Works D/D, C/S (Loan, OECF)
2001-02 Western River Basins of Mt. Pinatubo M/P, F/S (Tech. assistance, JICA)
Bicol River Basin
1978-81 Mayon Sabo Works M/P (Tech. assistance, JICA)
1982 Nationwide River Dredging M/P (Loan, OECF)
1982-83 Mayon Sabo Works M/P (Tech. assistance, JICA)
1998-00 Mayon Sabo Works M/P,F/S(Tech. assistance, JICA)
Tacloban City
1994-95 Flood Contorol M/P (Tech. assistance, JICA)
Ormoc City
1997 Flood Control (Phase I) C/S (Grant-aid, JICA)
1999- Flood Control (Phase II) C/S (Grant-aid, JICA)
Agusan River Basin
1982 Nationwide River Dredging M/P (Loan, OECF)
1983 Lower Reach D/D (OECF)
1989-99 Lowerr Reach (Phase I) C/S (Loan, OECF)
1998- Lower Reach (Phase II) C/S (Loan, JBIC)
BABUYAN ISLAND
CATANDUANES
MARINDUQUE
MINDORO
ROMBLON
MASBATE
SAMAR
LEYTE
CEBU
NEGROS
BOHOL
SIQUIJOR
PALAWAN
MINDANAO
BASILAN
SULU
TAWI-TAWI
SCALE
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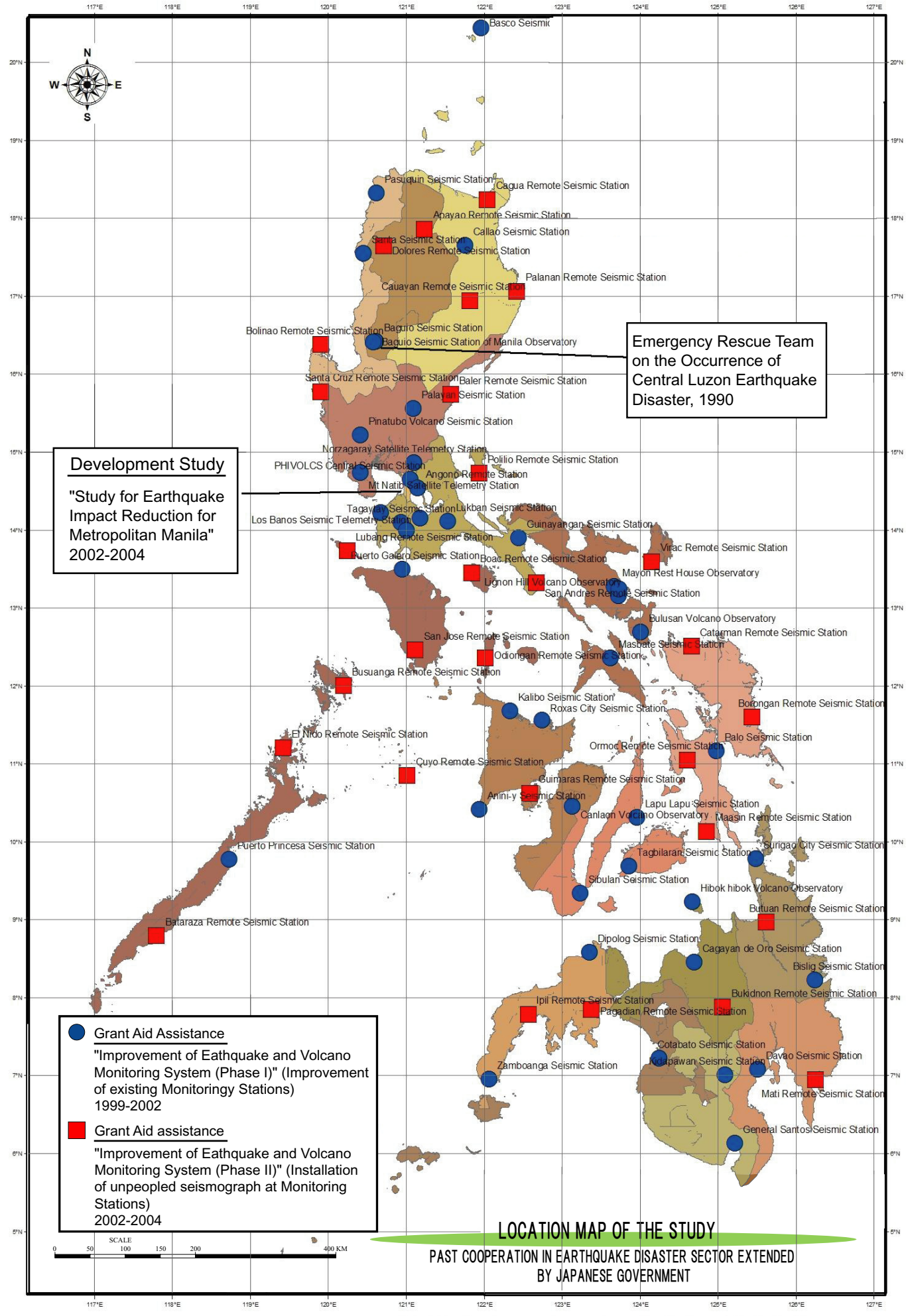
LOCATION MAP OF THE STUDY
MAIN RIVER BASINS AND IMPLEMENTED PROTECTS BY ASSISTANCE OF JAPANESE GOVERNMENT


Basco Seismic
Pasuquin Seismic Station
Cagua Remote Seismic Station
Apayao Remote Seismic Station
Callao Seismic Station
Santa Seismic Station
Dolores Remote Seismic Station
Palanan Remote Seismic Station
Cauayan Remote Seismic Station
Bolinao Remote Seismic Station
Baguio Seismic Station
Baguio Seismic Station of Manila Observatory
Santa Cruz Remote Seismic Station
Baler Remote Seismic Station
Palayan Seismic Station
Pinatubo Volcano Seismic Station
Norzagaray Satellite Telemetry Station
PHIVOLCS Central Seismic Station
Polilio Remote Seismic Station
Angono Remote Station
Mt Natib Satellite Telemetry Station
Tagaytay Seismic Station
Lukban Seismic Station
Los Banos Seismic Telemetry Station
Guinayangan Seismic Station
Lubang Remote Seismic Station
Puerto Galera Seismic Station
Boac Remote Seismic Station
Virac Remote Seismic Station
Mayon Rest House Observatory
Lignon Hill Volcano Observatory
San Andres Remote Seismic Station
Bulusan Volcano Observatory
Catarman Remote Seismic Station
Masbate Seismic Station
San Jose Remote Seismic Station
Odiongan Remote Seismic Station
Busuanga Remote Seismic Station
Kalibo Seismic Station
Roxas City Seismic Station
Borongan Remote Seismic Station
El Nido Remote Seismic Station
Ormoc Remote Seismic Station
Palo Seismic Station
Cuyo Remote Seismic Station
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Anini-y Seismic Station
Lapu Lapu Seismic Station
Canlaon Volcano Observatory
Maasin Remote Seismic Station
Puerto Princesa Seismic Station
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Surigao City Seismic Station
Sibulan Seismic Station
Hibok hibok Volcano Observatory
Butuan Remote Seismic Station
Bataraza Remote Seismic Station
Dipolog Seismic Station
Cagayan de Oro Seismic Station
Bislig Seismic Station
Bukidnon Remote Seismic Station
Ipil Remote Seismic Station
Pagadian Remote Seismic Station
Cotabato Seismic Station
Davao Seismic Station
Zamboanga Seismic Station
Kidapawan Seismic Station
Mati Remote Seismic Station
General Santos Seismic Station
Emergency Rescue Team on the Occurrence of Central Luzon Earthquake Disaster, 1990
Development Study
"Study for Earthquake Impact Reduction for Metropolitan Manila"
2002-2004
Grant Aid Assistance
"Improvement of Eathquake and Volcano Monitoring System (Phase I)" (Improvement of existing Monitoringy Stations)
1999-2002
Grant Aid assistance
"Improvement of Eathquake and Volcano Monitoring System (Phase II)" (Installation of unpeopled seismograph at Monitoring Stations)
2002-2004
SCALE
0 50 100 150 200 400 KM
LOCATION MAP OF THE STUDY
PAST COOPERATION IN EARTHQUAKE DISASTER SECTOR EXTENDED BY JAPANESE GOVERNMENT

PHOTOGRAPHS

Kickoff Meeting (Mandarin Oriental Hotel, Manila, September 24, 2004)


Atty. Pricilla P. Duque, Office of Civil Defense


Mr. Manuel M. Bonoan, Undersecretary of DPWH


Discussions


Mr. Yoshihiro Motoki, Team Leader of the Study Team

First Workshop (Mandarin Oriental Hotel, Manila, October 13, 2004)


Discussions


Mr. Allan Virtucio, Office of Civil Defense

Second Workshop : Earthquake Disaster Mitigation Sector
(Mandarin Oriental Hotel, Manila, October 14, 2004)

Left: Ms. Betty C. Cavo(Principal of Quezon City Technical High School)
Right: Barangay Cupang, Mr. Jing Elec

Mr. Rommel C. Banloi
(Professor of National Defense University)

Second Workshop: Flood and Debris Disaster Sector
(Oasis Hotel, Angeles, Manila, October 15, 2004)

Participatory Group Session (Group A)

Participatory Group Session (Group B)

Fourth Workshop (Dusit Hotel Nikko, Manila, December 2, 2004)

Discussions

Dr. Benito Pacheco (Association of Civil Engineering)

Fifth Workshop (JICA Philippine Office, Manila, December 3, 2004)

Staff of JICA Philippine Office, JICA Experts and Concerned Personnel of JBIC

Study Team members

List of Abbreviations

A	ADB	Asian Development Bank
	ADPC	Asian Disaster Preparedness Center
	ADRC	Asian Disaster Reduction Center
	AFP	Armed Forces of Philippines
	AMMS	Administrative & Manpower Management Service (DPWH)
	AO	Administrative Order
	ARMM	Autonomous Region in Muslim Mindanao
	ASEAN	Association of South East Asian Nations
	ASSEC	Assistant Secretary
	ASEP	Association of Structural Engineers of the Philippines
	AusAID	Australian Agency for International Development
B	BFD	Bureau of Forest Development (DENR)
	BIR	Bureau of Internal Revenue
	BOC	Bureau of Construction (DPWH)
	BOD	Bureau of Design (DPWH)
	BOE	Bureau of Equipment (DPWH)
	BOM	Bureau of Maintenance (DPWH)
	BRS	Bureau of Research and Standards (DPWH)
	BSP	Bangko Sentral ng Pilipinas (Central Bank of the Philippines)
C	CAR	Cordillera Administrative Region
	CARL	Comprehensive Agrarian Reforms Law
	CARP	Comprehensive Agrarian Reforms Program
	CAS	Country Assistance Strategy
	CIDA	Canadian International Development Agency
	CO	Community Organization (also Certificate Origin)
	COA	Commission on Audit
D	DA	Department of Agriculture
	DANIDA	Danish International Development Agency
	DAO	Department Administrative Order
	DAR	Department of Agrarian Reform
	DBM	Department of Budget and Management
	DBP	Development Bank of the Philippines
	DENR	Department of Environment and Natural Resources
	DEO	District Engineering Office (DPWH)
	DepEd	Department of Education (former DECS)
	DFA	Department of Foreign Affairs
	DILG	Department of Interior and Local Government
	DND	Department of National Defense
	DOE	Department of Energy
	DOF	Department of Finance
	DOH	Department of Health
	DOJ	Department of Justice
	DOT	Department of Tourism
	DOST	Department of Science and Technology
	DOTC	Department of Transportation and Communications
	DPWH	Department of Public Works and Highways
	DSWD	Department of Social Welfare and Development
	DTI	Department of Trade and Industry
E	EC	European Commission
	ECC	Environmental Compliance Certificate
	EFCOS	Effecture Flood Control Operation System
	EIA	Environmental Impact Assessment
	EIRR	Economic Internal Rate of Return
	EMB	Environmental Management Bureau (DENR)
	EO	Executive Order
	EU	European Union

List of Abbreviations

F	FCSEC	Flood Control and Sabo Engineering Center
	FFWSDO	Flood Forecasting and Warning System for Dam Operation
	FINNIDA	Finnish International Development Agency
	FMB	Forest Management Bureau (DENR)
	F/S	Feasibility Study
	FSP	Forestry Sector Project
G	GDP	Gross Domestic Product
	GIS	Geographic Information System
	GNP	Gross National Product
	GPS	Global Positioning System
	GTZ	German Agency for Technical Assistance
H	HLURB	Housing and Land Use Regulatory Board
	HUDCC	Housing and Urban Development Coordinating Council
	HQ	Head Quarters
I	IBRD	International Bank for Reconstruction and Development
	IDNDR	International Decade of Natural Disaster Reduction
	IEC	Information, Education & Communication
	IEE	Initial Environmental Examination
	IRR	Implementing Rules and Regulations
	ISDR	International Strategy for Disaster Reduction
	IT	Information Technology
	IWRM	Integrated Water Resources Management
J	JBIC	Japan Bank for International Cooperation
	JICA	Japan International Cooperation Agency
	JWF	Japan Water Forum
K	KfW	Kreditanstait fur Wiederaufbau (German Development Bank)
L	LGC	Local Government Code (RA 7160)
	LGUs	Local Government Units
	LLDA	Laguna Lake Development Authority
	LMB	Land Management Bureau (DENR)
	LWUA	Local Water Utilities Administration
M	M&E	Monitoring & Evaluation
	MIS	Monitoring and Information Services (DPWH)
	MMDA	Metropolitan Manila Development Authority
	MOA	Memorandum of Agreement
	MOU	Memorandum of Understandings
	M/P	Master Plan
	MPWH	Ministry of Public Works and Highways
	MTDIDP	Medium-Term DPWH Infrastructure Development Plan
	MTPDP	Medium Term Philippine Development Plan
	MWSS	Metropolitan Water works and Sewerage System
N	NA	Not available
	NAMRIA	National Mapping and Resources Information Authority
	NCR	National Capital Region
	NCSB	National Statistical Coordination Board
	NDCC	National Disaster Coordinating Council
	NEDA	National Economic and Development Authority
	NGOs	Non-governmental Organization
	NHA	National Housing Authority
	NHCS	Napindan Hydraulic Control Structures
	NHRC	National Hydraulic Research Center, UPERDFI
	NIA	National Irrigation Administration
	NPC	National Power Corporation
	NRDC	National Resources Development Corporation
	NSO	National Statistics Office
	NWRB	National Water Resources Board

List of Abbreviations

O	OCD	Office of Civil Defense
	ODA	Official Development Assistance
	OECF	Overseas Economic Cooperation Fund of Japan (JBIC)
P	PAGASA	Philippine Atmospheric, Geophysical, and Astronomical Services Administration
	PCM	Project Cycle Management
	PCSD	Philippine Council for Sustainable Development
	PD	Presidential Decree
	PDM	Project Design Matrix
	PDCC	Provincial Disaster Coordinating Council
	PDED	Project Development and Evaluation Division (DPWH)
	PFA	Public Forest Administration
	PHIVOLCS	Philippine Institute of Volcanology and Seismology
	PIA	Philippine Information Agency
	PICE	Philippine Institute of Civil Engineer
	PNCC	Philippine National Construction Corporation
	PNP	Philippine National Police
	PNRC	Philippines National Red Cross
	PO	Peoples' Organization
	PS	Planning Service (DPWH)
	PWP	Philippine Water Partnership
R	RA	Republic Act
	RDCC	Regional Disaster Coordinating Council
	RDP	Regional Development Plan
	RO	Regional Office (DPWH)
	ROW	Right-of-Way
	TOR	Terms of Reference
U	UN	United Nations
	UNICEF	United Nations Children's Fund
	UNCHS	United Nations Commission on Human Settlements
	UNHCR	United Nations High Commissioner for Refugees
	UNDP	United Nations Development Programme
	UNEP	United Nations Environment Programme
	UP	University of the Philippines
	UPLB	University of the Philippines at Los Baños
	USAID	United States Agency for International Development
	USEC	Undersecretary
V	VAT	Value Added Tax
W	WB	World Bank
	WMO	World Meteorological Organization
	WSSD	World Summit of Sustainable Development
	WTO	World Trade Organization
	WWF	World Water Forum

The Republic of the Philippines

The Study on Program Formulation in Disaster Mitigation Sector in the Philippines

Outline of the Study

This Study has formulated total nine cooperation programs (draft) (flood and debris disaster and earthquake disaster sectors) against priority issues selected through identification of future priority issues in disaster mitigation sector in the Philippines and arrangement of a list of for mid- and long-term directions of cooperation. The study period is approximately three months from September to December 2004.

In the course of the above tasks, the study team has conducted analyses of current conditions of the disaster mitigation sector in the Philippines, review of past achievements in cooperation, interview to concerned personnel of the related agencies (concerned personnel of the Philippine Government, private NGO, concerned personnel of the Government of Japan, foreign donor agencies and regional Disaster Coordination Councils, etc.), workshops and questionnaire survey on disaster awareness.

The recommended cooperation programs (draft) and long-term direction for cooperation (draft) are described as follows:

Cooperation Programs (Draft) (Flood and Debris Disaster Sector)

Target	Cooperation Programs (Draft)	Priority Issues in the Programs (Draft)
Reduction of Hazard (Structural measures)	Program for Enhancement of Construction, Operation and Maintenance of Flood Control and Sabo Structure	1.1 Formulation of Flood Control Plan for respective river basins (Flood Control Master Plan and Sabo Planning) 1.2 Review of Design Flood 1.3 Feasibility Study of selected project(s) 1.4 O & M of existing flood control and sabo infrastructure
Reduction of Vulnerability (Non-structural measures)	Program for Enhancement of Evacuation Systems	2.1 Establishment of FFWS 2.2 Preparation of Hazard Map 2.3 Construction of Database
Institutional Strengthening (Supporting measures)	Program for Institutional Strengthening for Flood Management	3.1 Review of laws and regulations 3.2 Organizational reform of DPWH (Reform of DPWH organization - 2nd Plan: Reform of PMO organization) 3.3 Training of DPWH staff 3.4 Enhancement of Research and Development Capability 3.5 Accumulation of Knowledge and Establishment of Information Sharing System 3.6 Establishment of Technical Standards and Guidelines, etc.
	Program for Enhancement of Comprehensive and Integrated Countermeasures	4.1 Enhancement of Comprehensive Flood Control Plan (including strengthening of flood plain management) 4.2 Enhancement of Integrated Water Resources Management

Cooperation Programs (Draft) (Earthquake Disaster Sector)

Target	Cooperation Programs (Draft)	Priority Issues in the Programs (Draft)
Enhancement of Disaster Risk Reduction Capacity of Metro Manila	Program for Enhancement of Disaster Risk Reduction Capacity of Metro Manila	1.1 High Level Advocacy Program 1.2 Promotion of Communication among National Government, LGU and Community 1.3 Enhancement of Disaster Risk Reduction Capacity of LGUs 1.4 Enhancement of Disaster Risk Reduction Capacity of Barangays (Communities) 1.5 Promotion of Earthquake Information Transfer and Dissemination System
Promotion of Earthquake Resistant Urban Development	Program for Promotion of Earthquake Resistant Urban Development	2.1 Promotion of Sustainable Growth of Metro Manila
Improvement of Seismic Performance of Buildings	Program for Improvement of Seismic Performance of Buildings	3.1 Improvement of Seismic Performance of Buildings 3.2 Retrofitting of a Symbolic Building (Demonstration Project)
Improvement of Seismic Performance of Infrastructure	Program for Improvement of Seismic Performance of Infrastructure	4.1 Improvement of Seismic Performance of Infrastructure 4.2 Risk Reduction of Dams 4.3 Evaluation of Earthquake Disaster Risk (Investigation of Active Faults) 4.4 Introduction of Risk Reduction Concept into Development Projects
Program for Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas	Program for Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas	5.1 Hazard and Risk Mapping of the Philippines 5.2 Evaluation of Earthquake Disaster Risk 2 (Preparation of Disaster Management Plan for Tsunami)

Long-Term Direction for Cooperation (Draft)

Goal	Long-term Vision
Flood & Debris Disaster Sector	
Reducing hazard magnitude (Structural Measures)	■ Assistance in implementation of new flood control project ■ Assistance in review of the master plan and in renewal of setting target and properties of the river basin
Reducing vulnerability (Non-Structural Measures)	■ Assistance in establishment of new FFWS ■ Assistance in monitoring of continuous O & M of database system of flood control and sabo engineering ■ Continuation of assistance for preparation of hazard maps ■ Assistance in revision of disaster mitigation plan and evacuation plan by means of utilization of hazard map (further strengthening and developing community disaster mitigation) ■ Continuation of assistance in promotion of new technology of disaster mitigation and application to other regions ■ Assistance in introducing flood plain management to new flood control project ■ Assistance in evaluation of effect on cooperation regarding resettlement issue and continuation of the assistance
Institutional strengthening (Supporting Measures)	■ Assistance in strengthening of entire administration of water resources (assistance in establishment of Ministry of Water Resources, etc.) ■ Continuation of assistance in independent and sustainable activities of research and development by the Philippine side ■ Assistance in formulation and implementation of comprehensive and integrated plans by the Philippine side (comprehensive flood control measures and integrated water resources management, etc.) ■ Assistance in accumulation of knowledge and strengthening of information sharing system

	■ Assistance in development and dissemination of technical standards and guidelines to regional and district offices
Earthquake Disaster Sector	
Enhancement of Disaster Risk Reduction Capacity of Metro Manila	■ Assistance to enhance legal framework, institutional arrangement, and disaster management planning at national level ■ Monitoring of the following programs and activities carried out throughout Metro Manila and the nation • Encourage cooperation and coordination between local government and community • Increase disaster risk reduction capacity of local governments • Increase disaster risk reduction capacity of community
Promotion of Earthquake Resistant Urban Development	■ Assistance for implementation to promote sustainable growth of Metropolitan Manila
Improvement of Seismic Performance of Buildings	■ Monitoring and assistance for the Philippines to improve seismic performance of buildings
Improvement of Seismic Performance of Infrastructure	■ Promotion for integration of disaster risk reduction concept into development programs ■ Earthquake risk reduction of dams nationwide
Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas	■ Monitoring of the following programs and activities • Encourage cooperation and coordination between local government and community • Increase disaster risk reduction capacity of local governments • Increase disaster risk reduction capacity of community
Promotion of Research on Earthquake Disaster	■ Assistance for capacity building for earthquake research ■ Continuation of assistance for implementation of earthquake disaster information transfer and dissemination system

THE STUDY
ON
PROGRAM FORMULATION IN DISASTER MITIGAITON SECTOR
IN THE PHILIPPINES

FINAL REPORT
(SUMMARY)

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Although the Philippines frequently suffers from a variety of natural disasters (such as typhoons, volcanic eruptions and earthquakes), the country's institutions, systems and technologies for dealing with natural disasters still seem to be immature. Public investment in measures against natural disasters, including in human resources development, seem to be restricted due to the limited national budget and the presence of other sectors with higher priorities, and therefore, this investment has not been adequate. However, the perennial damage to the economy and human lives is often devastating, and damage to the fundamentals of agricultural production and commodity flow in the country are often apt to result in a serious impact on long-term economic activities. This, in turn, leads to an increase in regional inequalities and migration to urban areas. Therefore, providing appropriate disaster mitigation measures is vital for the Philippines to ensure a sound national economy and enhance fundamental social infrastructures. Further, with expectations to contribute to poverty reduction, effective disaster mitigation measures have to be promoted to alleviate risks to the poor.

Japan has been involved in many cases of assistance to the disaster mitigation sector in the Philippines for more than 30 years. The assistance has covered a diversity of measures, including flood control, sabo, volcanic eruption and earthquake measures, and has been provided to many agencies and organisations. Especially in recent years, a wider range of concepts and activities including non-structural measures, such as the integrated disaster mitigation plans and regional development of adjacent areas, have been involved in the assistance. The disaster mitigation sector in the Philippines requires further mid and long-term assistance including institutional reformation and capacity building of related agencies. Such longer-term assistance could contribute to better assistance in the sector, and to achieving sustainable society and environment and human security.

Under these circumstances, clarifying both the current recognition of the personnel concerned and the direction for the future cooperation is a prerequisite to building a consensus among the related agencies of both countries in order to explore cooperation approaches that are efficient for the Philippines, and to promote better planning for the implementation of projects in the Philippines.

1.2 Objective of the Study

This Study aims to explore priority issues in the disaster mitigation sector for the future cooperation to produce a list of the Main Issues for Future Cooperation (draft), to formulate the Cooperation Program (draft), and then to form common perception between JICA and related personnel in the Philippines. The targeted area of the Study is the entire area of the Philippines.

1.3 Basic Policy of the Study

This Study aims at formulating the Cooperation Program (draft) for the flood and debris flow disaster and the earthquake disaster sectors, which cause the majority of the total damage by all types of disasters in the Philippines. The following figure illustrates a flow of the formulation of the draft program.

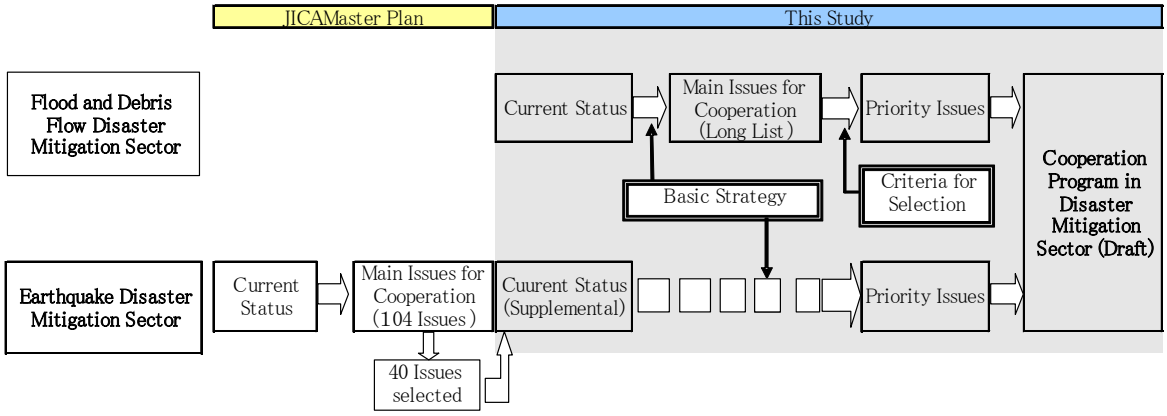


Figure 1.1 Process of Program Formulation

Regarding the earthquake disaster sector, 40 priority issues for future cooperation have already been chosen through the Study for Earthquake Impact Reduction for Metropolitan Manila in the Republic of the Philippines (MMEIRS) completed in March 2004 under assistance of JICA. Hence, in this Study, the 40 issues were reviewed and necessary additional items were added to the list. On the contrary, regarding the flood and debris flow sector, this Study was conducted by analysing current situations through to selecting priority issues for future cooperation. Results of workshops and questionnaire surveys were carefully examined and duly considered in deciding priority issues.

The following five basic policies were applied to select main and priority issues for future cooperation and to formulate the Cooperation Program (draft):

a) Strengthening of disaster mitigation with a context of development (based on the viewpoint of poverty eradication and human security)
b) Strengthening of structural and non-structural measures (at an appropriate level for the Philippines)
c) Strengthening of community disaster management
d) Continuation of effective cooperation extended by the Japanese Government
e) Strengthening of coordination among related agencies in the Philippines, international agencies, developed countries and non-governmental organizations.

1.4 Methodology of Plan of Operation

Based on "Chapter 3 - Plan of Operation" in the Inception Report, the following study items were worked out:

(1) <u>The first field work period:</u>

- Explanation and discussion of the Inception Report
- Collection and analysis of existing data and information
- Confirmation and analysis of current activities for disaster mitigation among the related agencies in the Philippines
- Research and analyses of current activities for disaster mitigation by international agencies , developed countries and NGOs

- Study on past cooperation extended by the Japanese Government in the disaster mitigation sector and identification of its impact
- Survey of awareness in cooperation for disaster mitigation of the JICA related personnel in the Philippines
- Identification of issues for future cooperation in the disaster mitigation sector
- Survey on disaster awareness of the related agencies and residents (through subletting)
- Explanation and discussion of the Interim Report.

(2) Home work in Japan:

- Explanation and discussion of Interim Report
- Analysis of past Japanese assistance for disaster mitigation
- Examining priority issues in the future cooperation in the disaster mitigation sector
- Preparation, explanation and discussion of the Draft Final Report.

(3) Second field work period

- Discussion with JICA Philippine Office and related agencies of the Government of the Philippines

(4) Period for compilation after returning to Japan

- Submission of Final report
- Meeting for final presentation about the Study

1.5 Study Schedule

The official meetings held during the first field work and the home work are listed in the following table. The entire study period was from September 14 to December 19, 2004, as in Figure 1.2.

Table 1.1 List of Official Meetings

Event	Date	Objective	Participants
Meeting on TV system (Manila – Tokyo)	Sep.15, 2004	Confirmation of recognition on the Study between JICA and Study Team at commencement of the Study	Tokyo side:10 persons (incl. study Team) Manila side:7 persons (JICA Head Quarter in Tokyo, 11th Fl.)
Kick-off Meeting	Sep.24, 2004	Announcement of commencement of the Study to the related agencies of Japanese and Philippines sides	Total 41 persons (Hotel Mandarin Oriental, Manila)
1st Workshop	Oct.13, 2004	Confirmation of disaster awareness and current activities among the staff in the central government agencies of the Philippines	Total 27 persons (Mandarin Hotel Oriental, Manila)
2nd Workshop	Oct.14, 2004 (Earthquake Disaster Sector) Oct.15, 2004 (Flood and Debris Disaster Sector)	Confirmation of disaster awareness and current activities among regional government and residents	Total 28 persons (Mandarin Hotel Oriental, Manila) for earthquake Total 27 persons (Oasis Hotel, Angeles) for flood and debris
3rd Workshop	Oct.26, 2004	Discussions on the Interim Report with experts and JICA related personnel, etc.	Total 10 persons (JICA Philippine Office, Manila) (incl. Study Team)

Meeting in Japan	Nov.04, 2004	Explanation and discussion on Interim Report with representatives of Ministry of Foreign Affairs, Ministry of Land, Infrastructure and Transport and JICA	Total 11 persons (JICA Head Quarter in Tokyo) (incl. Study Team)
4th Workshop	Dec.02, 2004	Explanation and discussion on Draft Final Report with the central government agencies of the Philippines	Total 29 persons (Hotel Dusit Nikko, Manila)
5th Workshop	Dec.03, 2004	Explanation and discussion on Draft Final Report with JICA Experts and JICA staff of the Philippine Office	Total 13 (JICA Philippine Office) (incl. Study Team)

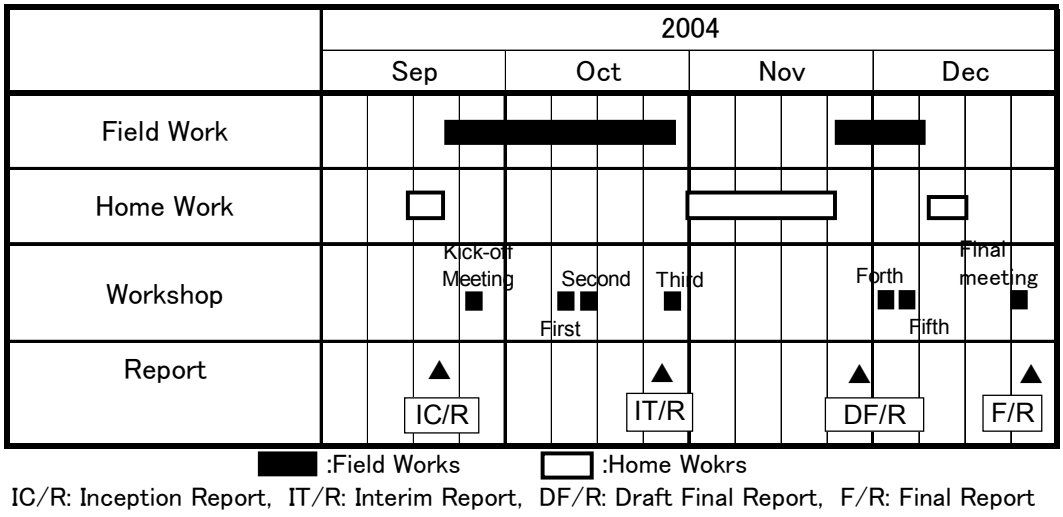


Figure 1.2 Study Schedule

1.6 Composition of Study Team

The members of the Study Team and their assigned working periods are as follows:

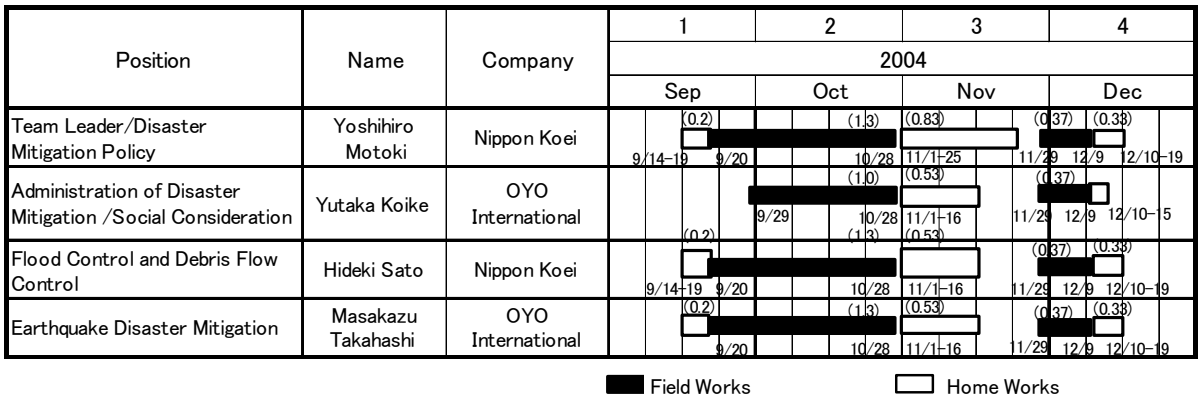


Figure 1.3 Assignment Schedule of the Study Team

CHAPTER 2

OUTLINE OF NATURAL DISASTERS IN THE PHILIPPINES

2.1 Natural Conditions

(1) Topography

The Philippines consists of around 7,100 islands, but just 11 of the islands cover 94% of the gross area of the country (about 300,000 km^2). The Philippine archipelago is located between the latitude of N 4°23' and 21°25' and latitude of E 116° and 127°, surrounded by the South China, Sulu and Celebes Seas, and the Pacific Ocean. The top of Mount Apo in Mindanao is recorded as the highest altitude of 2,954 m of the country.

(2) Geology

The Philippine archipelago consists of two geologically distinct geological units, a mobile belt and a stable region. Most of the archipelago is on the mobile belt where earthquake epicentres and volcanoes are concentrated. The archipelago is surrounded by many trenches, where the Philippine and Eurasian plates meet, and which can be interpreted as subduction zones. There are around 220 volcanoes in the Philippines, and 22 of them whose eruption records remain are defined as active volcanoes. The volcanoes as well as recorded epicentres are distributed along the trenches.

(3) Climate

The archipelago belongs to the tropics and has distinct dry and wet seasons in general. However, climate conditions vary regionally with terrain, monsoon directions and typhoon courses. The climate in the Philippines is normally classified into the following four types, mainly according to the amount and patterns of rainfall.

Table 2.1 Division of Climate and Its Characteristics

Division	Characteristics	Typical Region
Type I	Two pronounced seasons; the dry season from November to April, and the wet season during the rest of the year	Ilocos, Central Luzon, Southern Tagalog (eastern part), Western Visayas (eastern part)
Type II	No dry season, with a very pronounced maximum rainfall period from November to January	Bicol (western part), Eastern Visayas, Southeastern Mindanao
Type III	Seasons are not very pronounced, with a relatively dry season from November to April and wet season during the rest of the year	Bicol (eastern part), Western Visayas (western part), Central Visayas (eastern part), Northern Mindanao (northern part), Southwestern Mindanao (eastern part)
Type IV	Rainfall more or less distributed throughout the year	Cagayan Valley (western part), Bicol (eastern part), Central Visayas, Mindanao (southern part)

The annual average temperature is from 28 to 36 ºC, and the average relative humidity is generally between 70 to 80%. The average annual rainfall is around 2,030mm, and approximately a half of it is

brought by typhoons. Typically, most of the 20 typhoons that form in the Pacific per year move towards the Philippines, and about ten of them strike the country directly. The east coasts of the archipelago, apart from Mindanao Island, have normally been affected more often and more seriously than other regions. Not only typhoons but also frontal deluges have caused significant flood damage in many cases every year.

(4) River basins

In the Philippines, there is no river classification system, such as the 1st and 2nd class rivers in Japan. The National Water Resources Board (NWRB) divided the nation into twelve Water Resources Regions in 1976. Regarding rivers, 421 river basins with more than 40 km^2 of catchment have been enumerated as the "Principal River Basins" and 18 out of the 421 rivers, whose catchment is 1,400 km^2 or more, have been called the Major River Basins.

2.2 Socio-economy

(1) Demography

The population of the Philippines is 76.5 million as of May 2000 and its density is 255 persons/km^2 on average. The highest recorded annual population growth rate was 3.08% in 1970. Since then, population growth has shown a decreasing trend and fell to 2.36% in 2000. The poverty population ratio varies regionally. According to the record in 2000, the Manila Metropolitan Region shows the lowest ratio of 11.4%, whereas the ratio in ARMM has reached 71.3%. In general, regions in the Mindanao Islands have higher poverty population ratios.

(2) Economy

The Philippines' economy has shown a bullish growth for the last decade. The annual growth rate of the Gross Domestic Product (GDP) was 4.5% in 2001 and 6.4% in 2003, and 6.4% in the first quarter of the year 2004. The unemployment rate in the country has been showing an increasing trend since 1990, and was 11.4% in the first quarter of 2004. The inflation rate was 3.1% per year in 2003, and was estimated as 4.1%[1] in the first quarter of 2004. The average annual income per person was 300,000 Pesos in the Manila Metropolitan Region, whereas just one third of that in the regions in Visayas and Mindanao.

As compared in the indicator of annual change (figure compared with the one in previous year) in GDP of the country and Region 3 from year 1986 to 2000, the figure of Region 3 in 1991, when Mt.Pinatubo erupted, showed -4.3% instead of +1.5% in national level. After year 1991, only one time of annual minus growth rate was recorded in 1998 when the economic crisis in East Asia occurred. In view of this, it is obvious that disaster makes huge influence in national and regional economy of the Philippines.

2.3 Natural Disasters

The Philippines is astride one of the most striking natural disaster belts in the world, and has been affected by a variety of natural disasters, such as typhoons, floods, earthquakes, volcanic eruptions, drought, slope failure, high tides and many other types of disasters. Among the major disasters that have

[1] Source: "Topic Outline of the Medium-Term Philippine Development Plan (MTPDP)" (As of 31 August 2004 Version)

occurred since the 1980's, the disaster which recorded the heaviest casualties was a debris flow in Ormoc, the Leyte Island, led by Typhoon Uring in November 1991. (Fatalities: 5,101, Missing: about 3,000) The Central Luzon Earthquake in July 1990 recorded the largest property damage of about 12,200 million Pesos. Another devastating disaster was the eruption of Mount Pinatubo in 1991. The eruption affected not only the regional but also the national economy, which recorded a negative growth rate in national GDP.

Among the various types of natural disasters, typhoons/tempests, which cause about 70% of the total casualties of all types of disasters, are overwhelmingly dominant in terms of casualties as shown in the following table. The numbers of affected people (including dead and injured) caused by typhoons/tempests, earthquakes, volcanic eruptions and floods account for more than 95 % of the total casualties by all types of disasters. Therefore, assistance for fundamental measures for these four types of disaster should contribute much to the entire disaster mitigation sector.

Table 2.2 The Number of Casualties by Type of Disaster (1905-2003)

Type of Disaster	Number of fatalities	Ratio	Number of injuries	Ratio	Number of affected people	Ratio
Typhoon/Tempest	31,738	66%	25,154	62%	67,526,050	78%
Earthquake	8,728	18%	13,054	32%	2,353,631	3%
Volcanic eruption	2,996	6%	1,188	3%	1,541,518	2%
Flood	2,652	6%	570	1%	10,432,585	12%
Slope failure	1,453	3%	293	1%	295,968	0%
Infectious disease	364	1%	0	0%	13,178	0%
High wave/Tide	69	0%	0	0%	6,262	0%
Drought	8	0%	0	0%	4,185,050	5%
Fire	2	0%	0	0%	300	0%
Pest damage	0	0%	0	0%	200	0%
Total	48,010	100%	40,259	100%	86,354,742	100%

Source：The OFDA/CRED International Disaster Data Base

2.4 Disaster of Flood and Debris Flow

(1) Outline of current damage

The average death toll for 24 years from 1970 to 2003 was 544 persons/year. Including the injured and missing persons, its total becomes 1,478 persons/year. The number of affected households is estimated at about 550,000, the affected population would reach 2.8 million, and the property damage would be about 4,600 million Pesos. A destructive typhoon disaster, which causes more than 10 billion Pesos of damage, would be expected to occur once in six years. Property damage is around 8 billion Pesos per typhoon, which is equivalent to around 2% of the annual national budget of the Philippines.

In addition to the damage resulting from typhoons, there have been many cases of flood and debris disasters originated from frontal heavy rainfall and volcanic eruptions. The significant flood and debris disasters in the 1990s and later are summarised in the following table:

Table 2.3 Major Sediment Disasters including Landslides

Date	Type of Disaster	Features of Damage
June 1991	Lahar disasters in Mt. Pintubo Area. Debris flow or hyper-concentrated flow of sediment and water caused by heavy rainfall, and breaching of natural lake at the top	Large lahars have been recorded 3 times after the eruption in 1991 with total casualties of 850, and total property damage of 10.4 Bil. Peso.
Nov.2-5, 1991	Large scale debris flow disaster in the Ormoc River caused by Typhoon Uring	More than 8,000 causalities. Sabo dams, concrete channel and bridges, etc. were constructed by grant-aid of the Japanese Government.
2001 (last eruption)	Mud and debris flow disasters in Mt. Mayon Area	Damage data is included in the damage data of Mt. Mayon eruption and difficult to segregate.
Nov. 6-9, 2001	Debris flow disasters in Camiguin Island (Misamis Oriental, Mindanao)	Damage happened by debris flow including flash floods caused by Typhoon Nanang (Nov. 6 to 9, 2001). Total casualties were 366 (including dead:148)
Dec. 16-18 2003	Landslide including mud and debris flow disasters in San Francisco, Liloan in southern Leyte	Damage by landslide, mudflow and debris flow happened in December 2003, by local storm rainfall with total causalities of 244 (including dead of 200 and total property damage of 364 mil. Pesos).
August 2004	Flood disaster of the Tarlac River in the Central Luzon	Collapse of the right bank levees due to the typhoon Marse. 96 houses were destroyed completely or partially. The storage effect of the San Roque Dam and a lack of communications among agencies were revealed.

2.5 Earthquake and Tsunami Disaster

The Philippines is located on the circum-Pacific seismic belt, and is subject to earthquakes and volcanic eruptions. One of the most significant earthquakes that have recently occurred was the one striking the Central Luzon in July 1990. Fatalities numbered more than 1,000. Tsunami also have inflicted serious damage. One of the most striking records of tsunami disasters is more than 8,000 fatalities and injured in Mindanao in August 1976. The following table summarises the damage from the major earthquake and tsunami disasters. The table shows that one quake or tsunami results in great damage without adequate defence or preparation.

Table 2.4 Major Earthquake and Tsunami Disasters

Date	Earthquake/Tsunami	Fatalities	Injured	Affected Households	Damage (Billion Pesos)
Aug. 1976	Moro Gulf Earthquake (Tsunami)	3,700	8,000	12,000	0.276
June 1991	Luzon Earthquake	1,283	2,786	227,918	12.226
Nov. 1994	Mindoro Earthquake	83	430	22,452	0.515

Source: PHIVOLCS
Note: Figures vary according to sources. The figures in this table are from the official announcement of the Government of the Philippines.

CHAPTER 3

CURRENT STATUS OF DISASTER MITIGATION ACTIVITIES OF RELATED AGENCIES IN THE PHILIPPINES

3.1 National Policies and Strategies

(1) National Policy

In the Philippines, the legal framework of disaster mitigation is formed by Presidential Decree No.1566 (PD 1566, enacted in 1978), Republic Act 7160 (RA 7160, known as "Local Government Code"), Republic Act 8185 (RA 8185, amending RA 7160 Sec.324 (d)) and their bylaws. Basically, the Philippine disaster management policy is to comply with PD1566, which stipulates the nation's principles in disaster mitigation, and to realize its regulations and policies. The Local Government Code stipulates that the mayors of LGUs shall conduct disaster management and that local government shall take necessary action. Based on this legal background, disaster coordination councils have been established at regional, provincial, municipal and Barangay levels, under the guidance of the Department of Interior and Local Government.

(2) Disaster Mitigation Policies in the Medium-Term Philippine Development Plan

The Medium-Term Philippine Development Plan 1993-1998 listed disaster mitigation policies: (i) implementing appropriate infrastructure projects for flood control and other disaster mitigation schemes, (ii) promoting disaster mitigation activities through enlightenment, disaster restoration, drills and other practices, and (iii) enhancing research on disasters. These policies aim at increasing capacities for disaster mitigation of government agencies and each level of the Disaster Coordination Councils. The Middle-Term Philippine Development Plan 2001-2004 does not proclaim national policies and plans regarding disaster management, but it mentions implementation strategies for flood control, drainage and debris flow schemes in the sub-section on water resources in Chapter 6: Accelerating Infrastructure Development. In the latest Medium-Term Philippine Development Plan (2004-2010), there is no particular description of disaster mitigation. However, regarding flood control, there are descriptions in "Chapter 3 Environment and Natural Resources" and mentions names of priority flood control projects.

3.2 Legal Framework

(1) Laws regarding disasters

In addition to the basic laws described above, the National Building Code (PD1096, determining the minimum requirements and design guidelines to protect buildings from fires and natural disasters) and the Fire Code (PD 1185, listing security measures and duties for preventing building fires) are also the major laws regarding disaster management.

(2) Current trends

In recent years, the National Disaster Coordination Committee (NDCC) and the Office of Civil Defence (OCD) have actively drafted bills aiming at enhancing a disaster management capacity at all levels of the society. Various bills, regarding structural reforms, improving communities' awareness of disaster

mitigation, institutional strengthening of governmental agencies, disaster mitigation and other related issues, have been discussed in the parliament. One of the remarkable bills is the Lower House Bill No. 221, the bill regarding preparation for and mitigation of disasters, which attempts to enhance disaster-related institutions at all levels from the nation to communities. Unfortunately, the disaster-related bills do not seem to be regarded as important in the parliament.

3.3 Organization

The core organization for disaster mitigation in the Philippines is the National Disaster Coordination Council (NDCC). NDCC is composed of 19 line agencies. The duties for each agency are allocated as tabulated below:

Table 3.1 Duties of 19 Line Agencies – National Disaster Coordination Council (NDCC)

Departments and Agencies	Works in charge
Department of Public Works and Highways (DPWH)	Rehabilitation of public facilities, provision of equipment for rescue/relief activity.
Department of Agriculture (DA)	Estimation of the damage to agriculture and fishery industries, and technical support for the farmer victims.
Department of Education (DepEd)	Support for public relations for disaster mitigation. Providing schools for refugees.
Department of Health (DOH)	Medical and hygiene works. Guiding the disaster mitigation organization in a hospital.
Department of Labor and Employment (DOLE)	Providing urgent employment for the victims. Guiding the disaster mitigation organization in factories.
Department of Interior and Local Government (DILG)	Supervising each level of DCC, and training the DCC in local authorities.
Department of National Defense (DND)	Securing communication, supporting urgent rehabilitation, rescue/relief activities.
Department of Social Welfare and Development (DSWD)	Training the DCC in cooperation with OCD and DILG. Organizing rescue and relief activity.
Department of Tourism (DOT)	Guiding organization of disaster mitigation in hotels and restaurants.
Department of Trade and Industry (DTI)	Control of prices, and securing commodities during an emergency.
Department of Transportation and Communications (DOTC)	Administration of transportation and communication, and rehabilitation of facilities of transportation and communications.
Department of Science and Technology (DOST)	Flood forecasting, typhoon warning system (PAGASA). Monitoring volcanic and earthquake activities (PHIVOLCS).
National Economic and Development Authority (NEDA)	Evaluation of impact on social economic plan due to occurrence of disaster.
National Housing Authority (NHA)	Securing homes during emergency.
Philippine Information Agency (PIA)	Public relations relating to disaster mitigation.
Philippine National Red Cross (PNRC)	Enforcement of disaster mitigation drills, and supporting DCC's drills.
Department of Budget Coordination Committee (DBM)	Administration of necessary budget for disaster mitigation activities.
Department of Finance (DOF)	Enforcement of roles of disaster mitigation fund in local authorities.
Department of Environment and Natural Resources (DENR)	Re-afforestation in frequent flooding areas.

The Disaster Coordination Councils at regional, provincial, municipal and barangay levels have played a central role for disaster mitigation in each area. The organisation structure is illustrated in the following chart.

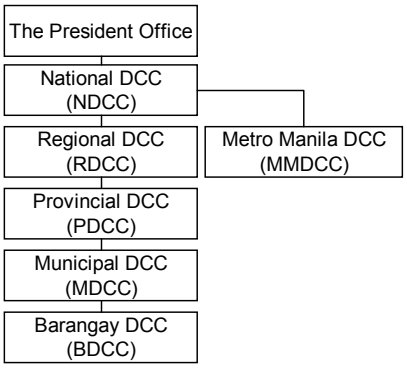


Figure 3.1 Organizational Structure of Disaster Coordination Councils

3.4 Budget

The NDCC has no budget of its own. The line agency should manage their disaster mitigation related activities and programs with their own budget. As for the budgets for rescue on emergency, restoration and reconstruction, which are required upon occurrence of the disasters within the corresponded fiscal year, the National Calamity Fund is available.

When the central government utilizes the National Calamity Fund for rescue and restoration, the application shall be submitted to NDCC through OCD and then, after evaluation, it is endorsed to the Office of the President. For instance, the ceiling amount of the National Calamity Fund in 2004 is 700 mil. Pesos and, on the other hand, that in 1996 was 910 mil. Pesos.

3.5 Current Activities of Related Agencies in the Philippines

(1) The National Disaster Coordination Council (NDCC) and the Office of Civil Defence (OCD)

1) Current trend of the Office of Civil Defence (OCD)

The Office of Civil Defence (OCD), a secretariat for the NDCC, has the Natural Disaster Management Center as its headquarters and 17 Regional Centers in the entire country. The OCD's duties cover a wide range of national civil defence, establishing policies and plans for protecting civilians during domestic and international conflicts, defence of the state and civilians, training of civilians, NGOs and volunteers.

Through the experiences of the Central Luzon earthquake in 1990, the Mount Pinatubo eruption in 1991, and a series of large floods in the 1990s, there is a recognition and expectation for the role of the OCD during and after disasters. In the late 1990s, the OCD's structure and system was reformed so as to enhance government's administrative function of disaster mitigation, as well as the OCD's function, after coping with the experiences of the serious disasters in the 1990s. As a consequence, the OCD has recently come to play an active role in disaster mitigation in the Philippines. The major activity of the OCD is to develop frameworks and tools for local government units, which actually implement and have to play the central role in the disaster mitigation administration. Examples of consequences of the OCD's activities are the abovementioned bills regarding disasters and a manual of planning for emergency situations for local government units.

Further, floods striking the Central Luzon and the Manila Metropolitan Region in August 2004 stimulated the government, especially the OCD and DPWH, to establish the National Flood Management Committee and the Regional Flood Management Committee (tentative names). Most of the major water-related government agencies, such as NIA, NHRC, PHILVOCS, PAGASA, DILG, NEDA, OCD, and NWRB, are expected to take part in these committees.

2) Present situations and problems of Civil Defence (OCD)

The OCD has recently been active in developing, proposing and implementing national disaster mitigation policies. It has worked in closer cooperation with academia, such as the Society of Civil Engineers, and with international organizations, such as UNHCR and the World Bank. The OCD can be said to have accumulated the latest data and information on disaster mitigation from many places of the world. Limited human resources, budget and basic tools are problems to be solved by the OCD.

(2) The Department of Public Works and Highways (DPWH)

1) Structure and budget

The headquarters of the DPWH, which is the major government agency in charge of flood control, has ten bureaus and seven Project Management Offices (PMOs) as of August 2004. The PMO-MFCP (Project Management Office – Major Flood Control Projects) and PMO-Pinatubo have responsibility for major flood control projects funded by foreign aid agencies. However, mainly because of limited human resources (only 30 to 40 members, about a half of this is engineers), major flood control projects have not been adequately implemented and managed. A smaller scale of infrastructure projects is conducted by 16 regional offices and/or 126 district offices with non-international funds. The DPWH have internally discussed their structural reformation, but its contents have not been made public. According to the budget allocation to sectors in the middle term public investment implementation plan (2004-2009), the share of the budget for flood control will be kept constantly low during the period, although the proportion against the total budget is planned to slightly increase from 11.4% to 17.3%. Budget available for flood control is estimated at approximately 5 billion Pesos per year.

2) Flood Control and Sabo Engineering Center (FCSEC)

FCSEC was established under DPWH in 2001. Under the Project of Enhancement of Capabilities in Flood Control and Sabo Engineering of the DPWH (ENCA) supported by JICA, technical transfer programs, such as training and seminars, have been conducted for improving technical capacities in planning, design, construction supervision and operation and maintenance of flood control and sabo facilities. Manuals of planning and design of river structures and other manuals are being established. One of the future issues is utilising and improving these manuals through actual projects.

3) The Study on Flood Control Project Implementation System for Principal Rivers in the Philippines

Unlike major rivers, whose flood control measures have been gradually developed under Japanese financial and technical assistance, flood control measures for small or middle-scale rivers have constantly been behind due to lack of DPWH's budget. In order to improve such a situation, the Study

on the Flood Control Project Implementation System for Principal Rivers was conducted to enhance structural capabilities of project implementation on medium scale rivers under the technical and financial assistance of JICA. A middle-term action plan (2005-2010), a long-term action plan, and a long-term flood management program (including establishment of the National Flood Management Committee) were proposed.

(3) The Department of Environment and Natural Resources (DENR)

The Forestry Management Bureau and the Protected Area and Wildlife Bureau of DENR have taken charge of administration regarding forestry, which has a strong relationship with comprehensive flood control measures and river basin management. A close connection between DPWH and DENR would be the key to promote comprehensive watershed management. Further, coordination with other government agencies will have to be built through NWRB as introduced in the subsequent section.

(4) The National Water Resources Board (NWRB)

The NWRB has an overall responsibility for water resources development and management, and its major duty is to maintain and enforce the Water Code. The NWRB works mainly for establishing water resources development and management policies, coordinating various agencies related to water resources, approving water use rights, and resolving conflicts between water allocation and use. The members of the NWRB are the Ministers of DPWH, DENR, NEDA, DA, DOH, and DOT, and the heads of MWSS, LWUA, NIA and NPC. The minister of DPWH acts as a chairperson of the board. Each member government agency has to implement water-related projects, but there is no sole organisation for comprehensive river basin management.

(5) Philippine Atmospheric, Geophysical & Astronomical Service Administration (PAGASA)

PAGASA belongs to the Department of Science and Technology (DOST), one of the members of NDCC. The flood forecasting and warning system (FFWS), which should play an important role for disaster mitigation, is operated and managed by the Flood Forecasting Branch (FFB) of PAGASA. The FFWS was first introduced to the Philippines by a Japanese grant aid in 1973. The system has been expanded and improved mainly with a yen loan since then. However, the existing facilities are getting deteriorated, and some problems like lack of precision of observation results can be found. Under the circumstances, PAGASA have made efforts to enhance a FFWS function through a variety of activities, such as re-development of flood forecasting models, improvement of institutional structure, and implementing programs to raise residents' understanding over FFWS with assistances from JICA. These activities have produced slight success, but not sufficient enough to reach to the radical improvement of the FFWS function. To cope with such a condition, JICA provided the technical cooperation project "the Strengthening of Flood Forecasting and Warning Administration" (April 2004 to April 2006), which is expected to enhance capacities of operating, managing and running FFWS of PAGASA.

(6) Philippine Institute of Volcanology and Seismology (PHIVOLCS)

PHIVOLCS has been in charge of various issues regarding volcanic eruptions and earthquakes, such as

prediction, monitoring, formulation of disaster prevention plans, and research and development. Its activities cover the fields not only of social sciences but also of social matters, such as disaster reduction education and training and enlightenment of people. For instance, according to the 5-year Middle Term Business Plan issued in 2004, action plan items include earthquake education, research on social vulnerability, and risk evaluation as well as expansion of the observation network and preparation of hazard maps.

Through the "Improvement of Earthquake and Volcano Monitoring System" and the "Study for Earthquake Impact Reduction for Metropolitan Manila" with the assistance of the Japanese Government, facilities and technologies have been transferred to PHIVOLCS. PHIVOLCS has many educated staff and has been conducting vigorous research and activities. However, despite the fact that its successful consequences require adequate investments in facilities and technologies, its annual expenditure in the year 2003 was limited to around 152 million Pesos, and the majority of that was needed to be spent on the operation of existing facilities. Hence, the progress of research and development was restricted by funds. More opportunities to utilise the acquired technologies and knowledge are to be afforded.

(7) The Metropolitan Manila Development Authority (MMDA)

The MMDA law decrees that the MMDA should deal with matters which have an impact on the entire Metro Manila area, affect across administration boundaries of each local government unit, and require large investment beyond capacities of an individual local government unit. Examples of its actual activities are: establishing mid- and long-term development plans, regulating land use and development, traffic control, solid waste disposal, managing flood control and urban drainage, health and hygiene, emergency first aid training, and emergency actions during disasters. There are about 8,800 members of staff as of January 2004, and 4,900 out of them are permanent staff. However, manager classes of staff, who can actually make daily decisions, are limited, and duties and work are concentrated on the limited number of staff.

As for the disaster management, the Secretary of MMDA chairs the MMDCC and shares the responsibility of disaster countermeasures in Metro Manila. However, the activities of MMDCC is not so active and many requests for improvement are forwarding from the member agencies.

(8) Non-Governmental Organisations (NGOs)

More than 65,000 NGOs are officially registered in the Philippines. (This number includes NGOs which currently are not active.) The characteristics and actual activities of each NGO can hardly be grasped because of the large number of NGOs and the fact that their activities cover a wide range of areas. However, acquiring more information about NGOs should be beneficial, because cooperation with NGOs, which work with local communities, would be essential for achieving attentive assistance. For instance, NGOs, which have appropriate experience, could work efficiently to enlighten local residents and give them information regarding flood control and disaster mitigation.

One of the existing NGOs that has already played an important role is the Philippine National Red Cross (PNRC). Its branch officers act as members of DCCs at local levels, and actively work on rescue operations, relief activities and reconstruction.

CHAPTER 4

COOPERATION IN DISASTER MITIGATION SECTOR EXTENDED BY JAPANESE GOVERNMENT AND ITS VERIFICATION

4.1 Flood Control and Debris Disaster Mitigation Sector

(1) General Views of Cooperation

1) Flood Control and Sabo Projects in the Major River Basins

Almost all of flood control and debris flow control projects are implemented by DPWH. Those in the major river basins (13 rivers) are listed below. Location of the major river basins is shown in Figure 4.1 and the chronological feature of flood control and sabo projects in the Philippines is illustrated in Figure 4.2.

(i) The Laoag River (Northern Luzon, Ilocos Norte, 1,353 km^2) (Flood and Sabo Works)
(ii) Cagayan River (Northern Luzon, 25,649 km^2) (Flood Control and other development) Although the Master Plan Study of river basin development was prepared in 1987, implementation of the project has not yet been started due to security problem. Further, the Feasibility Study was conducted in 2002 but still not implemented yet.
(iii) Agno River (Benguet, Pangasinan and Tarlac Provinces, 5,952 km^2) (Flood control, Sabo and other related works)
(iv) Pampanga River (Pampanga and Nueva Ecija Provinces, 9,759 km^2) (Flood control and other associated works)
(v) Pasig-Marikina River (Metro Manila, 4,678 km2) (Flood control and other associated works of Metro Manila)
(vi) Amnay-Patric River (Central part of Western Mindoro, 993 km^2) (Mainly Sabo Works)
(vii) Bicol River (South-eastern of Luzon, Albay, Camarines Sur and Norte, 3,771 km^2) (Flood control and Sabo works)
(viii) Panay River (North of Panay, 2,680 km^2) (Flood control and other associated works)
(ix) Jalaur River (Southeast of Panay, 1,503 km^2) (Flood control)
(x) Ilog-Hirabangan River (Southwest of Negros, 1,945 km^2) (Flood control)
(xi) Tagoroan River (North of Mindanao, Occidental Misamis, 1,704 km^2) (Flood control)
(xii) Agusan River (East of Mindanao, 10,921 km^2) (Flood control and irrigation works)
(xiii) Mindanao River (Central of Mindandao, 23,169 km^2) (Flood control and other associated works)

2) Flood Control Projects in the Urban Areas

(i) Ormoc City (Grant-aid, Leyte) (Flood control, Sabo works and urban drainage works)
(ii) Iloilo River (Loan, Panay) (Flood control)

3) Flood Control Projects in Metro Manila

(i) Flood Control and Drainage Projects in Metro Manila
(ii) Pasig River Improvement Project

(iii) North Laguna Lakeshore Urgent Flood Control and Drainage Project
(iv) KAMANAVA Flood Control and Drainage System Improvement Project (on-going)

4) Other Flood Control and Sabo Projects

The major flood control projects out of the above are listed as follows:

(i) Mt.Pinatubo Hazard Urgent Mitigation and Flood Control Projects
(ii) Mayon Volcano Comprehensive Disaster Mitigation Study

3) Flood Forecasting and Warning System Proejcts

The major projects supervised by PAGASA are listed as follows:

(i) Pampanga River Basin Flood Forecasting and Warning System
(ii) EFCOS Flood Forecasting and Warning System Project (Pasig-Marikina-Laguna Lake)
(iii) Agno, Bicol and Cagayan River Basin FFWS Projects
(iv) Flood Forecasting and Warning System for Dam Operation Project (Binga, Ambuklao, Angat Dams)
(v) Meteorological Telemetering System Project

(2) Achievements

1) Achievements of flood control and debris disaster mitigation projects

The achievement of the ODA (Official Development Assistance) by Japanese Government has greatly contributed not only in construction of flood and sabo structures through project implementation but also mainly in organizational reform and human resources development of DPWH. The structures constructed has functions as important social infrastructures in regions and indirect benefits for activation of regional economy by means of flood damage reduction is enormous. Further, continuous cooperation is gradually growing up core staff in the executing agencies in charge of project implementation through respective stage of project cycle, and the effect of the cooperation has been realized step by step.

2) Achievements of Flood Forecasting and Warning System (FFWS) Projects

The achievement of cooperation regarding FFWS is the systems provided through cooperation projects to PAGASA. They are the FFWS for dam operation and FFWS for river basins. At present, the systems have important function as information source of flood forecasting in the respective regions, though they involve certain problems. Based on the behaviours of local people during floods, it can be said that the systems have contributed in reduction of flood damage.

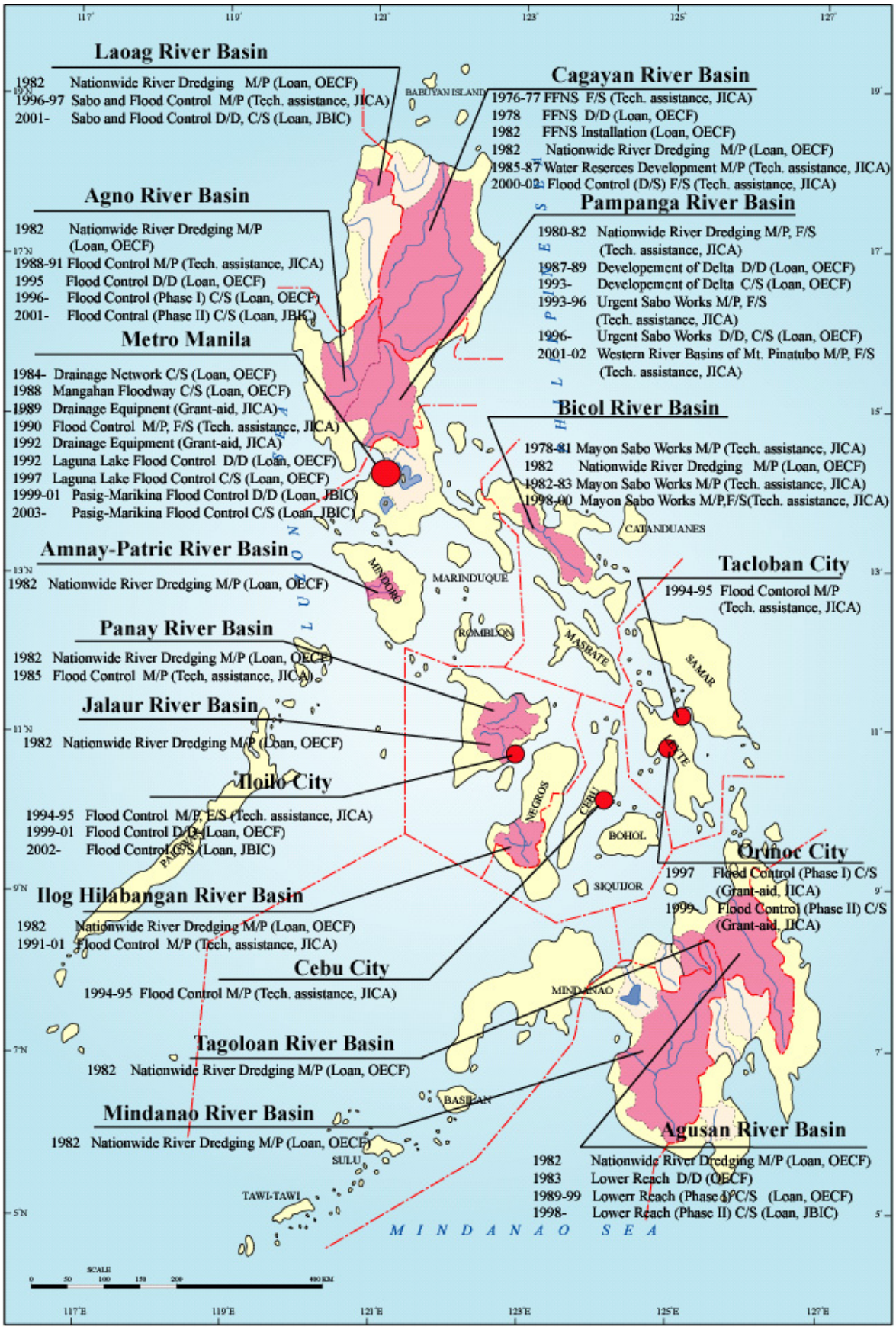


Figure 4.1 Location Map of Flood Control and Sabo Projects

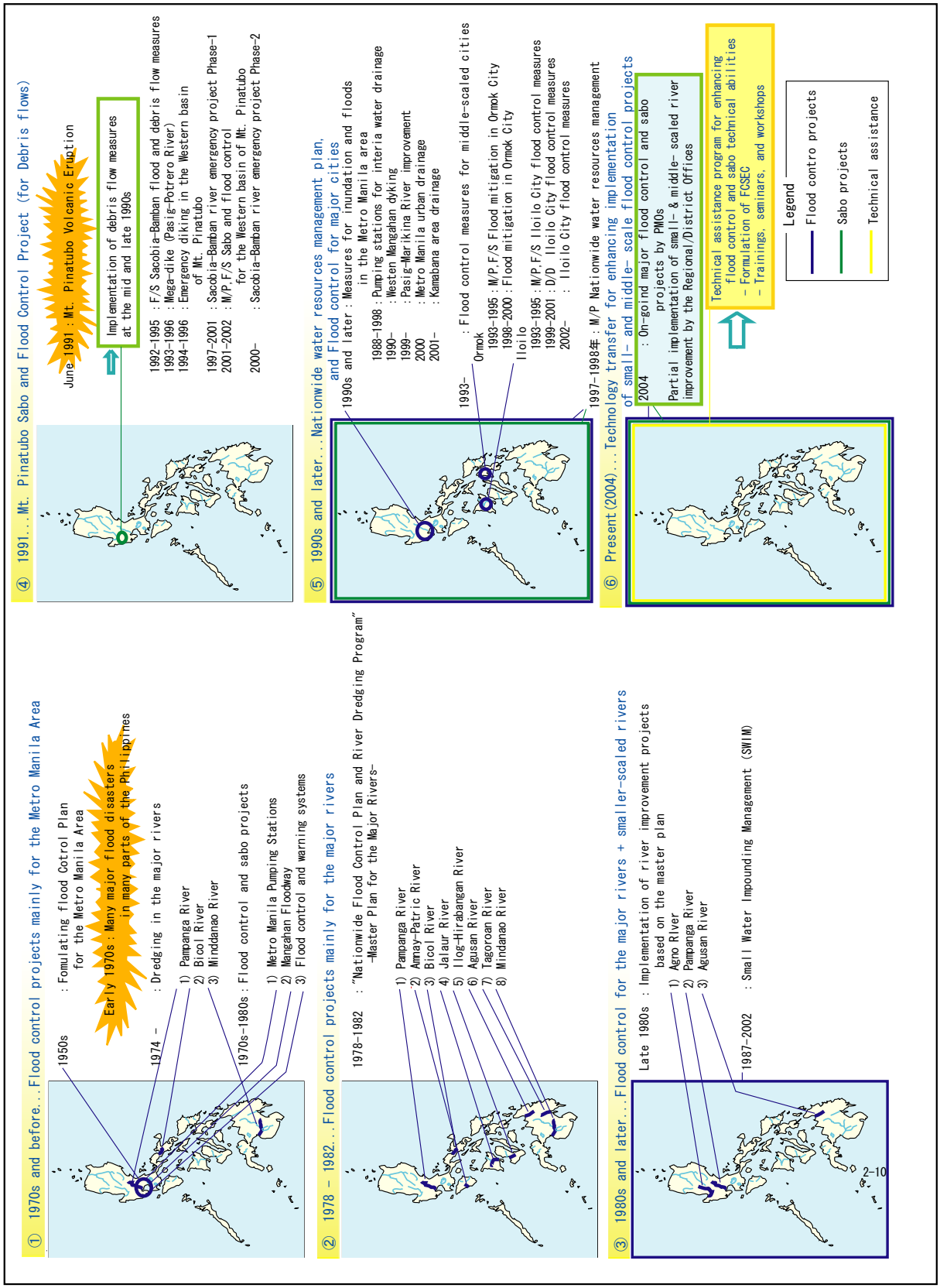


Figure 4.2 History of Flood Control and Sabo Projects in the Philippines

(3) Future Issues

The issues of projects implemented by Japanese ODA are summarized as follows:

1) Issues for flood control and sabo projects

- Accumulation of technical know-how

  Normally, technology transfer to the counterpart agency is included in the TOR of the project implementation. However, because the incentive given to the staff in the agency concerned is quite low, the effect has not been realized sufficiently.

- Smooth land acquisition

  The most serious problem in project implementation is delay of construction due to the problems of land acquisition and resettlement. Some definitive improvements are required.

- Securing budget for O & M

  Due to insufficiency of maintenance, the functions, which were planned and designed, are often not realized. Therefore, securing budget for maintenance is essential.

2) Issues for flood forecasting and warning system

- Accuracy of forecast information

  The forecast information is qualitative ones presently and more quantitative ones are required by the local people and related disaster management agencies.

- Over-aging of instruments

  Almost all instruments have aged more than 30years and have heavily deteriorated. Renewal of those is required.

- Shortage of budget in O & M

  PAGASA is promoting transmission of meteorological information externally and cost–recovery plan aiming at independent commercial feasibility. However, it stands still insufficient level.

3) Issues for overall institutional arrangement

- Organizational set-up

  DPWH was re-organized in 1980's from the sector-wise (i.e. highways, river/flood control and so on) to work-field (i.e. planning, design, construction, etc.) organization. Then, the tendency to decline road projects become significant and water-related projects has decreased drastically. Up to present, NWRB, NIA and MWSS have been separated from DPWH, and established independent and transferred to other agencies. In order to realize efficient implementation of projects, organizational strengthening of DPWH is required.

- Water Code

  As the minimum means, the river administrator shall be clearly defined and all rivers in the nation shall be demarcated under two management bodies of central and regional governments. The responsible organization system is required to be rearranged.

- Budget allocation

  The budget for maintenance is small and maintenance activities after project are not sufficiently conducted. Review for budget allocation become necessary.

- Securing staff

  As for the sustainable project implementation, the PMO's organization shall be reformed and appropriate number of staff shall be relocated. Especially, the permanent staff for river administration shall be trained.

(4) Overall Evaluation

After more than 30 years past the commencement of cooperation in flood and debris disaster sector, project effects such as damage reduction against flooding and impact to the regional economy by implementation of individual projects have gradually realized. In the aspect of capacity building of Pilipino engineers through transfer technology in the projects, they can manage to handle by themselves these types of technologies, so called hard technologies, such as design and construction supervision to some extent. However, the knowledge has been accumulated in the basis of each project, and thus, the technology of flood and debris control has not been founded yet due to the organizational problems of DPWH.

Therefore, it is essential that Japanese Government continues to keep basic policy in assisting the Philippine's self-sustaining by strengthening of the governmental organizations, which are responsible in flood control, and enabling sustainable activities. Further, introducing the non-structural measures (soft technology) and new technology (such as integrated water resources management) is also important. However, because it cannot be coped with only by the Philippine side, it seems that Japanese Government should extend effective cooperation based on the experiences and knowledge particularly for the field of comprehensive river basin development and integrated water resources management.

4.2 Earthquake Disaster Mitigation Sector

Major cooperation projects in earthquake disaster mitigation sector are listed as follows:

- Grant-aid : Improvement of Earthquake and Volcano Monitoring System in the Republic of the Philippines (Phase 1and 2) (1999 to 2004)
- Technical cooperation : Project for Improvement of Earthquake and Volcano Monitoring System in the Republic of the Philippines (2004 to 2006)

- Development study : Study for Earthquake Impact Reduction for Metropolitan Manila in the Republic of the Philippines (MMEIRS) (2002 to 2004)
- Emergency assistance/aid : Dispatching Japan Disaster Relief Team on the occurrence of Central Luzon earthquake disaster in 1990

(1) Grant Aid and Technical Cooperation

1) Outline

Project Title : Improvement of Earthquake and Volcano Monitoring System in the Republic of the Philippines (Phase 1, 2)

Counterpart Agency : Department of Science and Technology (DOST)
Philippine Institute of Volcanology and Seismology (PHIVOLCS)

Project Term : Phase 1: Year 1999 to 2002, Phase 2: Year 2002 to 2004

The project aimed at enhancement of earthquake and volcanological observation system over the Philippines. Through the Project, seismographs, data processing system, data transmission system, unpeopled volcanic monitoring and data transmission device, mirror censor data processor and storage devices, etc. were installed at the head quarter of PHIVOLCS, existing seismological and volcanological observation stations. Technical guidance and training were provided for effective use of the equipments as well.

2) Achievements

By means of installation of seismograph at the head quarter of PHIVOLCS and existing monitoring stations in parallel with renewal of monitoring equipments and data processing systems, technical capability in observation of earthquake and volcanic movement and in data storage have been greatly improved.

3) Future issues

Basic monitoring network has been established over the country and technology for evaluation and analysis of stored data has been transferred. These data will be used effectively for actual disaster management activities to minimize damage. For example, these data shall be used appropriately for administrative decision, alarming to residents and evacuation order. Framework on these data application is expected.

(2) Development Study

1) Outline

Study Title : Study for Earthquake Impact Reduction for Metropolitan Manila in the Republic of the Philippines (MMEIRS)

Counterpart Agency : Metropolitan Manila Development Authority (MMDA)
Philippine Institute of Volcanology and Seismology (PHIVOLCS)

Study Period : From August 2002 to March 2004

This Study was conducted to formulate a master plan for earthquake impact reduction for Metropolitan Manila in the Philippines. The main contents of the Study are, 1) survey on geology, social condition, buildings and infrastructure survey, 2) GIS database development, 3) production of 1:5,000 scale digital topographic maps, 4) estimation of earthquake hazards and damages, 5) disaster management plan, and 6) community based disaster management activities.

2) Achievements

Earthquake disaster scenario for Metropolitan Manila has been developed for the first time. Many stakeholders in the country had a unanimous idea for preparedness requirements to such a big disaster. National Disaster Coordinating Council (NDCC) has appreciated these series of results for their future disaster management activities. Metropolitan Manila Council has approved resolution on "Declaring the commitment to make metro manila seismically safe and establishing the mutual aid agreement among the local government units of Metro Manila in the event of disasters".

3) Future issues

The master plan proposed 104 action plans. These cover many items so that priority or procedure of implementation need to be clarified. The Philippine sides independently have to define their own target on risk reduction for earthquake disaster at first, then develop short to long-term framework for disaster reduction plan and finally introduce required measures. These activities are effectively supported with collaboration of foreign donor countries.

(3) Emergency Assistance and Aid

1) Outline

The Philippine experienced one of the strongest earthquakes with magnitude of 7.7 on July 16, 1990 which caused widespread damage and affected wide area on the island of Luzon. There was destruction of huge amount of houses and infrastructures, human casualties (1,660 dead, 3,513 injured and 1,594,000 affected). Japanese Government dispatched Japan Disaster Relief Team for rescue activities.

2) Achievements

Search and rescue, medical treatments were provided together with provision of medicine, medical equipments, power generators and flashlights. Also the team guided on procedure of recovering and disaster countermeasures, etc.

CHAPTER 5

CURRENT INTERNATIONAL TREND AND RESEARCHES AND STUDIES IN DISASTER MITIGATION

5.1 Current International Trend in Disaster Mitigation

The efforts in disaster mitigation were extended world-wide in the frameworks of the International Decade of natural Disaster Reduction (IDNDR) in the 1990s and the International Strategy of Disaster Reduction (ISDR) since 2000. The concept of IDNDR was enacted in the Plenary Session of the United Nations in December 1987 in order to reduce damage from natural disasters in the world, especially in the developing countries, through international coordinating activities during the decade of the 1990's. In May 1994, in the middle of the decade, the World Congress of International Disaster Reduction (Yokohama Conference) was held. The Yokohama Message ~ Yokohama Strategy aiming at a safer world ~ including promoting and strengthening international cooperation, integrated aspects of disaster mitigation in development plans, and recognizing roles of regional communities, etc. was adopted.

Further, under the concept that promoting cooperation at regional levels, which share types of disasters and measures for disaster mitigation, is important, the Asia Disaster Mitigation Centre was opened in Kobe in 1998 to accelerate multilateral cooperation regarding disaster mitigation in Asia. The centre provides a place for exchanging disaster mitigation experts from Asian countries, collecting and storing related information, and researching international cooperation in disaster mitigation.

In 2000, the ISDR was established under the UN system as a successor to IDNDR because the IDNDR's activities were considered to be continuing and a disaster mitigation culture was considered to be more developed in the world. ISDR has shifted the focus of its activities from "correspondence of disasters" to "prevention of disasters" and "progress towards management", aiming at forming communities tolerant to disasters. Disaster mitigation has been regarded as one of the major international issues, which should be tackled with close cooperation within international society in the 2000s. One remarkable example was the fact that disaster mitigation was indicated as the key to achieve sustainable development in the "World Summit on Sustainable Development" held in Johannesburg, South Africa in 2002. A long list of international activities regarding disaster mitigation in the 2000s has been extended by a variety of parties, including each state, international organisations, academic societies, NGOs, and private companies. Asia is no exception. Issues, suggestions and policies on disaster mitigation in the region have been discussed and advanced through the "Asian Conference on Disaster Reduction" held in 2003 and 2004.

5.2 Current Research and Studies on Disaster Mitigation in Japan

Achieving human security, which is emphasized in "the Official Development Assistance Charter" and "Japan's Medium-Term Policy on Official Development Assistance", should be central also for the disaster mitigation sector. Practical measures of programs should be urgently discussed and formulated to conquer vulnerability of the poor and to establish a society with adequate resistance to disasters. Under the circumstances, the Japan International Cooperation Agency (JICA) conducted several key studies on disaster mitigation, such as the "Basic Study on Disaster Mitigation and Development",

"Disaster Mitigation and Development ~ aiming at empowerment of capability of disaster mitigation in communities ~", and the "Research Study on Effective Disaster Management Cooperation". In the "Study on Project Formulation for Disaster Mitigation in the Philippines", the direction of cooperation for disaster mitigation was discussed. Further, the Ministry of Foreign Affairs of Japan conducted a "Study on Current Measures on Policies of Developed Countries and International Agencies". The outline of each study is summarised below:

1) **Basic Study on Disaster Mitigation and Development (JICA, March 1998)**: As basic information for discussing government assistance for the disaster mitigation sector, causes of damage, vulnerability of the society to disaster, and the resistance of the society were identified and examined from the view point of social sciences as well as science and engineering. Further, ideal forms of the resistance of the society to disaster were also discussed in this report.

2) **The Study on Project Formulation for "Disaster Mitigation" in the Philippines (August 1998)**: Damage from natural disasters, existing disaster mitigation systems and plans, and trends of assistance for the disaster mitigation sector were duly analysed. Priory items for Japanese official aid were suggested in each field of i) the national and local government units, ii) wind, earthquake and volcanic disaster mitigation, iii) urban disaster mitigation, and iv) community disaster mitigation. Practical aid plans for the selected priority items were also discussed in the study.

3) **Disaster Mitigation and Development ~ aiming at empowerment of capability of disaster mitigation in communities ~ (JICA, March 2003)**: Extended the discussions in the above study. The relationship between disaster mitigation and the society was discussed in more detail based on the social science viewpoint, rather than a conventional structural viewpoint.

4) **The Study on Current Measures on Policies of Developed Countries and International Agencies (Ministry of Foreign Affairs, March 2004)**: This study examined the latest disaster mitigation measures in, and trends of, assistance to the sector by major international organisations and developed countries. The results of this study were expected to provide basic information to prepare for disseminating the policies on disaster mitigation of the Japanese Government at the World Conference on Disaster Reduction to be held in Kobe in 2005 (the 2005 Kobe Conference) and a series of related meetings.

5) **Research Study on Effective Disaster Management Cooperation (JICA, to be completed in February 2005)**: JICA has turned experiences of numerous natural disasters in Japan to advantage in assistance for disaster mitigation to developing countries. JICA has accumulated considerable knowledge and experience regarding disaster mitigation measures in developing countries, and therefore, diffusing the acquired information should be beneficial to everybody. This study is examining and summarising JICA's experiences in preparation for presentation at the 2005 Kobe Conference. Then, results of this study are expected to contribute to formulating a JICA policy regarding measures against disasters in the future.

5.3 The World Water Forum and Related Activities

(1) The Third World Water Forum (WWF)

Based on the international consensus that water is one of the fundamental issues to be shared by the entire international society, the Third World Water Forum was held in Japan in March, 2003 to explore solutions to various water issues. In the WWF, practical activities were discussed to achieve the targets set at the UN Millennium Summit in 2000 and at the World Summit on Sustainable Development. The FFW declared that water issues should be the top priority and all nations should play a leading role for dealing with water-related problems because water is essential for achieving sustainable development, environmental sustainability and poverty alleviation. The necessity for the full cooperation of the international society as well as international and regional organisations was also claimed.

(2) The International Flood Network (IF Net)

The IF Net was established based on one of the propositions enunciated in the Third FFW, aiming at: (i) mitigating human and property damage by floods, and (ii) promoting policies and practices to cut the vicious circle of poverty and environmental degradation. The IF Net is expected to accelerate multinational cooperation in flood management.

(3) The Network of Asian River Basin Organizations (NARBO)

The NARBO is one of the action programs, which were established for solving international water issues, like IF Net. The NARBO was formulated on the initiative of the Asian Development Bank (ADB) to realise integrated water resources management (IWRM) in river basins in Asia, especially in developing countries in the region. The NARBO work for exchanging information and experiences, accelerating IWRM, and improving water governance among water-related and river basin organisations in Asia. Such NARBO activities are expected to lead to further cooperation in water issues among developing countries in the region.

(4) Japan Water Forum (JWF)

"Memorandum of Understanding on Partnership for experience exchange, enhancing the Northern Dimensions linking to the South" was declared in the Third WWF to establish closer connection with the South. Japan was nominated as the secretariat of the party. Then, the JWF was formulated involving a diversity of institutes, such as government agencies, academic societies and the industrial world. The three pillars of the function of JWF are think tank activities, the provision of information collected from water-related parties in many parts of the world, and activities for enlightenment and human resources development.

CHAPTER 6

COOPERATION EXTENDED BY INTERNATIONAL AGENCIES, DEVELOPED COUNTRIES AND REGIONAL CENTERS

6.1 Overview of Cooperation Extended by International Agencies and Developed Countries

(1) Official Assistance to the Philippines

In the Toronto Summit in Canada in June 1988, the Multilateral Aid Initiative (MAI) to the Philippines was proposed by the United States of America. This Initiative aimed to contribute to the sustainable development of the Philippines and to accelerate institutional improvement and structural reforms for more efficient assistance to the Philippines. This is regarded as the framework of international assistance and aid to the Philippines, and based on the MAI, the Consultative Group Meeting (CG Meeting) was held in Tokyo hosted by the World Bank in 1989.

(2) Share of Cooperation by International Agencies and Donor Countries

The amount of official development aid to the Philippines in 1999 was US$ 298 million from Japan and US$ 45 million from Germany, US$ 45 million from Australia and US$ 27 million from USA. Regarding international agencies, the World Bank provided US$ 6.5 million (for ODA only) and the Asian Development Bank provided US$ 21 million. Japan is the largest donor for the Philippines. Among the total amount of ODA to the Philippines of US$ 607 million, aid from Japan accounts for 49% of the total amount and 56% of the total of bilateral ODA. Further, in terms of the accumulated amount up to 1999, Japan is the largest donor having provided US$ 8,839 million.

6.2 Current Activities of International Agencies, Developed Countries and Regional Centers for Disaster Mitigation

Aid concepts and current activities for disaster mitigation in the Philippines of the major international agencies, donor countries and regional centres are summarised in the following table:

Table 6.1 Major Activities of International Agencies, Donor Countries and Regional Centers for Disaster Mitigation in the Philippines

Institution	Aid Concepts to Philippines	Aid Policies and/or Programs for Disaster Mitigation in the Philippines
International Agencies		
World Bank	Priorities in the World Bank's Country Assistance Strategy (CAS) for the Philippines corresponding to the Philippines' National Development Plan (FY2005-10) are: ● Providing efficient public services with enhancement of local governments ● Assistance for achieving development of Mindanao ● Security of environmental sustainability ● Improving the monitoring function for economic development and empowerment of the poor	The study titled "National Disaster Management in the Philippines: Enhancing Poverty alleviation Through Disaster Reduction" (May 2004) proposed to develop "National Framework Plan for Comprehensive Disaster Risk Management", and suggested the following three steps to prepare for formulating the national framework: ● Recognising presence of risks ● Mitigating risks ● Risk sharing and fund raising
Asian Development Bank	Priorities in the ADB's Country Strategy Program (CSP 2004-2006) for the Philippines are: ● Governance ● Environment and natural resources ● Human development ● Infrastructure ● Gender and development ● Social security and stability ● Regional cooperation ● Private sector development ● Partnership and coordination with other donors and financial sources	The executive board approved a "Disaster and Emergency Assistance Policy" in June 2004. This new policy requires prior preparation for future potential disasters, minimising disaster damage, and providing assistance for mitigating disaster.
UNDP	Poverty reduction is the central theme of assistance to the Philippines in the UNDP's Country Cooperation Framework (CCF 2002 – 2004). The priorities in the CCF are: ● Establishing an environment for sustainable development of human resources ● Empowerment of the poor ● Securing a sustainable environment ● Establishing foundations for peace and development ● Consideration towards gender	As a part of the International Strategy for Disaster Reduction (ISDR), UNDP have assisted the National Disaster Coordination Committee (NDCC) in producing the "Philippines Report on Disaster Reduction". Environmental disaster is considered one of the priorities of UNDP, and UNDP took part in establishing a framework for reducing risks in helping NDCC. Further, giving assistance to the Department of Environment and Natural Resources for preparing a geo-hazard map and to PHIVOLCS for community disaster mitigation activities.
UNHCR	The major role of UNHCR in the Philippines is to promote the execution of the 1951 Refugee Convention and to monitor it.	In cooperation with NDCC, UNHCR prepared an activity plan for emergency situations, and implementing risk management activities and training programs. NDCC also received technical assistance for preparing the "Contingency Planning for Emergencies, A Manual for Local Government Units" published in May 2003.
Donor Countries		
USA	The priority areas regarding assistance to the Philippines are: ● Establishing good governance against economy ● Solving conflicts in Mindanao ● Environment and Energy	USA provided funds to ADPC for implementing "The Asian Urban Disaster Mitigation Program" (1995 - 2004). This program aimed at reducing vulnerability of urban residents, infrastructure, important facilities and shelters in Asian countries

Institution	Aid Concepts to Philippines	Aid Policies and/or Programs for Disaster Mitigation in the Philippines
	● Family planning and health	including the Philippines, through i) demonstration projects, ii) information sharing and networking, and iii) training and education.
Australia	The priority areas regarding assistance to the Philippines are: ● Sustainable rural development and education ● Gender and development ● Promoting effective governance ● Promoting security and stability ● Promoting peace and development in Mindanao ● Partnership in development	Focused on non-structural measures, such as improving disaster mitigation capacity and promoting research on disaster mitigation. Community disaster mitigation has been promoted using a booklet titled "A Field guide to AusAID Emergency Response Procedures", and practical activities regarding community disaster mitigation will be commenced in Visaya and Mindanao.
European Commission	The priority areas regarding assistance to the Philippines are: ● Development assistance (emphasizing rural poverty reduction, health and environment) ● Economic assistance (promoting bilateral trade and investment)	
Regional Centres		
Asian Disaster Preparedness Center (ADPC)	Established in Bangkok in 1986, aiming at systematized activities for raising awareness and knowledge of disasters, for managing disasters at local levels, and for mitigating disaster damage. The major activities are: ● Training and education ● Technical assistance ● Implementation of regional programs ● Research on partnership, development of activities, and information	One of the recent activities in the Philippines is an education program called "Community Based Disaster Risk Management Course" held in Manila in July 2004.
Asia Disaster Reduction Center (ADRC)	Established in Kobe, Japan in 1998, as the central institution for promoting multilateral cooperation in disaster mitigation in Asia. The major activities are: ● Interchanging and exchanging disaster mitigation experts from related agencies in member countries ● Collecting and providing information regarding disaster mitigation ● Research on multilateral cooperation in disaster mitigation ● Collecting information regarding emergency aid from foreign countries when disaster incidences occur ● Planning documents and material for awareness creation and diffusing knowledge of disaster mitigation	Providing the country report of the Philippines containing information of recent disaster cases, a disaster mitigation system and training courses.

CHAPTER 7

WORKSHOPS

In order to confirm disaster awareness and disaster mitigation activities among the central and regional governments and related agencies in the Philippines, total five workshops were held in the course of the Study. The outline of results is shown as follows:

Table 7.1 Outline of Workshops

No.	Date	Purpose and Major Participants	Outline of Discussions
1st Workshop	Oct.13, 2004	To confirm disaster awareness and current activities of central government concerned disaster management Participants: 27 persons NDCC-OCD, NEDA, DPWH, PHIVOLCS, PAGASA, DILG, PNRC, MMDA, etc.	Common Session: Introduction of current flood damage in Northern Mindanao and Central Luzon and flood control projects assisted by Japanese Government in the subject river basins. Introduction of the result of the "Study for Earthquake Impact Reduction for Metropolitan Manila" and current disaster management activities in the Study area. Flood and debris disaster mitigation sector: (8 persons) At the flood and debris flow disaster group session, existing problems, namely causes of disasters, were analysed and measures against them were discussed. The major causes of disasters brought in the session were deforestation, poor construction materials, lack of awareness and cooperation from residents, lack of cooperation among central government and LGUs, limited budget, political corruption, inadequate interference of politicians, lack of basic technical information, inefficient technical transfer, inadequate effective facilities, lack of transparent policies, and obscure responsibility divisions among related government agencies. Promoting integrated river basin management was indicated as the key to solve those problems through the discussion. This implies that the importance of integrated river basin management seems to have come to be a consensus among related agencies. Implementation of flood control projects based on priorities and the necessity of a master plan for it were identified as required measures through the discussions. The participants also indicated the importance of non-structural measures, such as FFWS, land use control, improvement of watershed management, information dissemination and the enhancement of participatory disaster mitigation activities. Earthquake disaster mitigation sector: (9 persons) In the earthquake disaster session, discussions took place to explore practical methods to realise 104 action plans formulated under the "Study for Earthquake Impact Reduction for Metropolitan

			Manila in the Republic of the Philippines (MMEIRS hereinafter), based on six topics: systems relating to disaster mitigation measures in Metro Manila, raising earthquake resistance of houses, raising earthquake resistance of public facilities, urban development of the Metro Manila area, evaluation and examination of activities against earthquake, and disaster mitigation measures in the entire nation. Examples of major required actions pointed out by participants were: wide dissemination of the results of the MMEIRS regarding community disaster mitigation, enhancement of institutional cooperation among different agencies in terms of disaster management, development of the outskirts of the Metro Manila area or a second capital for reducing the existing risk derived by the high concentration in Metro Manila, formulation of basic information on present hazards, detailed studies of active faults, and preparation and appropriate management of hazard maps.
2nd Workshop	Oct.14, 2004 (Earthquake Disaster Mitigation Sector)	To confirm disaster awareness of regional government and current situation and problems in community-based disaster mitigation activities and needs in future earthquake disaster mitigation Participants: 28 persons Municipalities in Metro Manila	Discussions were focused on effectiveness of community-based disaster mitigation activities, its improvement and development aspects and supporting measures in such activities by LGUs. Disaster mitigation activities conducted by some barangays in Metro Manila when the earthquake occurred during the Study (Oct.8, 2004) were introduced.
	Oct.15, 2004 (Flood and Debris Flow Disaster Mitigation Sector)	To confirm disaster awareness, current situation of flood and debris flow damage and future problems and needs for countermeasures Participants: 27 persons Related regional governmental agencies in Region III	The major issues against flood disaster mitigation identified through discussions were limited budget, illegal occupation in river areas, lack of appropriate communications among the central and local government units, lack of motivation of government officers in charge, sediment deposit in river courses, illegal dumping of solid wastes in rivers and inadequate education and training. The discussion was conducted by means of PCM style with dividing into two groups of the participants.
3rd Workshop	Oct.26, 2004	Discussions on Interim Report with JICA Experts and staff of JICA Philippine Office Participants: 10 persons	The issues discussed are as follows: Flood and debris disaster mitigation sector: ・Process for extraction of cooperation issues ・Counterpart agency of the Philippine side ・Contents of the selected issues ・Achievements of cooperation extended by Japanese Government Earthquake disaster mitigation sector: ・Selected six targets, etc. Common subjects: Consistency of the Report in both sectors and clarification of data source, noted points for editing and expressions, etc.
4th Workshop	Dec.2, 2004	Discussions on Draft Final Report with central governmental	Recognition and current situation and vital issues were mutually accepted. The issues discussed are as follows:

		agencies Participants: 29 persons NDCC-OCD, NEDA, DPWH, PHIVOLCS, PAGASA, DILG, PNRC, MMDA, etc.	Flood and debris disaster mitigation sector: ・Education of engineers in city and provincial governments ・Effectiveness of past cooperation programs ・Necessity of non-structural measures and human development ・Integrated water resources management ・National Flood Management Committee and assistance by JICA ・Education and training of DPWH staff ・Review of legal framework and responsibility of NWRB ・O & M after project completion and LGU's responsibility, coordination with Donors, etc. Earthquake disaster mitigation sector: ・Influence of fire ・Contents of JICA Earthquake Impact Reduction Master Plan Study in Metro Manila ・Capacity building of disaster risk reduction of LGU ・Review of Architecture Basic Law ・Research of seismic resistance of buildings ・Other disasters rather than floods and earthquakes ・Promotion of community-based disaster management ・Unity of disaster mitigation measures (flood and debris/earthquake)
5th Workshop	Dec.3, 2004	Discussions on Draft Final Report with JICA Experts and representatives of JBIC and JICA Philippine Offices Participants: 13 persons	The issues discussed are as follows: Flood and debris disaster mitigation sector: ・Result of discussions in the meeting (JICA Tokyo Office) before dispatching the Study Team ・Recognition of FFWS ・Nation-wide FFWS Master Plan ・Selection of priority issues ・O & M of river structures ・Enhancement of evacuation system ・ Program of institutional strengthening, development of human resources ・Counterpart agencies of the Philippine side ・Mid- and long- term direction of cooperation ・Overall framework of disaster mitigation activities ・Flood control projects in Metro Manila ・Effective utilization of existing facilities and storage, resettlement, etc. Earthquake disaster mitigation sector: ・Contents of cooperation programs (draft) ・"Program for Promotion of Earthquake Resistant Urban Development" ・Handling of Angat Dam, etc.

CHAPTER 8

QUESTIONNAIRE SURVEY

8.1 Objective and Target Respondents

The objective of the Questionnaire Survey was to research the disaster awareness of the concerned personnel who belong to the Government, LGUs, residents, academia and private organizations in the Philippines (October 1 to 25, 2004). The regional level part of the survey was conducted with LGUs and residents in Region III for the flood and debris disaster mitigation sector, and in the Metro Manila area for the earthquake disaster mitigation sector.

8.2 Flood and Debris Disaster Sector

The following issues were focused in the survey regarding the flood and debris disaster mitigation sector:

1) Damage caused by recent floods and debris flows
2) Actual situations of disaster mitigation activities of related agencies (organization, budget, manpower, planning)
3) Awareness of present flood damage shared by organizations and individuals
4) Awareness of community disaster management (expected area of self-help).

The following table summarises the breakdown of respondents:

Table 8.1 Breakdown of Respondents (Flood and Debris Disaster Sector)

Organisation	No of Respondents
The Central Government and related agencies	21
LGU	21
Academia	2
NGO	5
Residents	21
Total	70

The major findings of the questionnaire results are:

- The flood prone areas are appointed and open in public in the most of areas managed by the targeted governmental agencies for the survey
- Many governmental agencies accepted that disaster management program shall be combined with regional development plan due to budget constraint
- Disaster awareness between residents in the target areas of the survey is generally high. Importance of preparedness is well acknowledged in the light of lessons learnt in past disasters.
- Disaster Coordination Council in region (PDCC, CDCC, BDCC etc.) are well acknowledged and highly expected by the residents. However, their activities and its extents are limited due to budget limitation.

- It is revealed that community-base disaster activities are well developed because of residents' firm response regarding function and activities of related organizations (evacuation sites are acknowledged).
- The residents accepted a concept of community-based disaster management, while they are in negative to payment for such activities with expectation to be responsible and share by the central and regional governments.
- NGO shares important roles in barangay-level disaster management in the community.
- To reduce damage by disasters, the needs in regular evacuation drill and education campaign are high.
- The concept of disaster mitigation measures to be integrated in regional development plan (disaster management and development) is entirely supported and its implementation is highly expected (lack of budget is constraint).
- Regarding the community-based disaster management by barangays, it is judged properly conducted because the areas are located in perennial inundation zone. On the other hand, high requirements were confirmed regarding capacity building of central and regional governments for administration of flood and debris flow control, improvement of disaster management/evacuation plans, improvement of contents of disaster information and its dissemination manners and enhancement of education and training, etc.

8.3 Earthquake Disaster Sector

The following aspects were focused on in the survey for the earthquake disaster sector:

1) Current status of overall disaster mitigation activities and, in particular, countermeasures of earthquake disaster
2) Actual disaster mitigation activities on-going after the "Earthquake Impact Reduction Study in Metropolitan Manila" (MMEIRS)
3) Methodology of project implementation and direction of cooperation proposed with basic approach of countermeasures against earthquake disaster in the Master Plan Study

The following table summarises the breakdown of respondents:

Table 8.2 Breakdown of Respondents (Earthquake Disaster Sector)

Organisation	No of Respondents
The Central Government and related agencies	19
LGU	31
Academia	4
NGO	1
Residents	15
Total	70

The major findings of the questionnaire results are:

- About 70 % of respondents have attempted to share the result of MMEIRS with other people around them.

- About 80% of respondents realise the importance of prevention measures for earthquake disasters.
- Around 85 % of respondents have already started certain measures for mitigating earthquake disasters.
- About 45% of respondents have attempted to utilise the calamity fund, which is restricted to measures after disasters, for advance activities.
- All items of the priority measures proposed in MMEIRS are considered to be achievable within the range of the national budget by about 60 to 70 % of respondents. Respondents seem not to rely on foreign aid too much.
- The overall result implies that the related parties in the Philippines seem not to rely highly on foreign aid to establish and realise policies and regal framework.
- Foreign assistance is expected for issues requiring a high level of technologies.
- Remarkably high awareness of disaster mitigation is observed among residents in the communities in which community-based disaster mitigation programs have been implemented under MMEIRS, and
- The survey result suggests that earthquake disaster risks could be mitigated when foreign assistance is given to parties with leadership and incentives, even if the assistance is limited.

CHAPTER 9

GENERAL VIEW OF COOPERATION PROGRAM (DRAFT) (FLOOD AND DEBRIS DISASTER MITIGATION SECTOR)

9.1 Basic Understanding

(1) Overall Framework based on Mechanism of Disaster Occurrence

As for forming an overall framework of disaster mitigation countermeasures, qualitative relationship between three components of "Disaster", "Hazard" and "Vulnerability" was considered. The disaster can be expressed by the following equation according to the "Disaster Mitigation and Development" published by JICA (March 2003) the following equation in nature:

$$\text{Disaster} = \text{Hazard} \times \text{Vulnerability}$$

Disaster can be defined as a function of the Hazard and the Vulnerability. The greater the Hazard is, the more the consequence of Disaster is, and the larger Vulnerability brings about the larger Disaster. Therefore, "reducing hazards" and "reducing vulnerabilities" can be considered to be the two pillars of disaster mitigation. Further, "enhancing institutional and administrative capability" of the flood and debris flow sector is the foundation to support the two pillars effectively and efficiently.

Further, in parallel with disaster prevention and mitigation as preparation prior to occurrence of disaster, to strengthen supporting rescue/response in emergency, restoration and recovery is also important for enhancement of disaster management capability of flood and debris disaster.

The above perspectives can be illustrated in Figure 9.1:

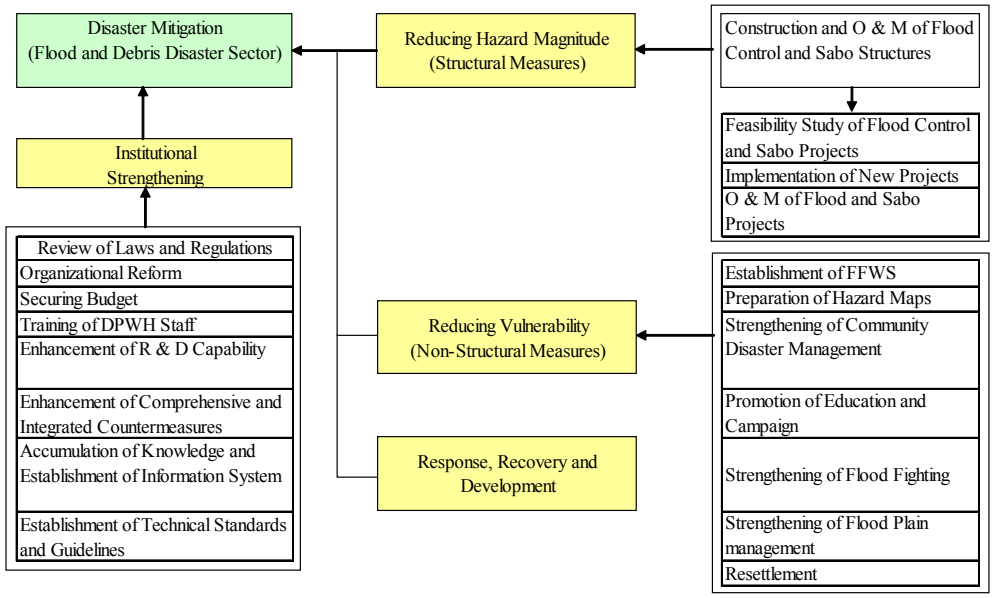


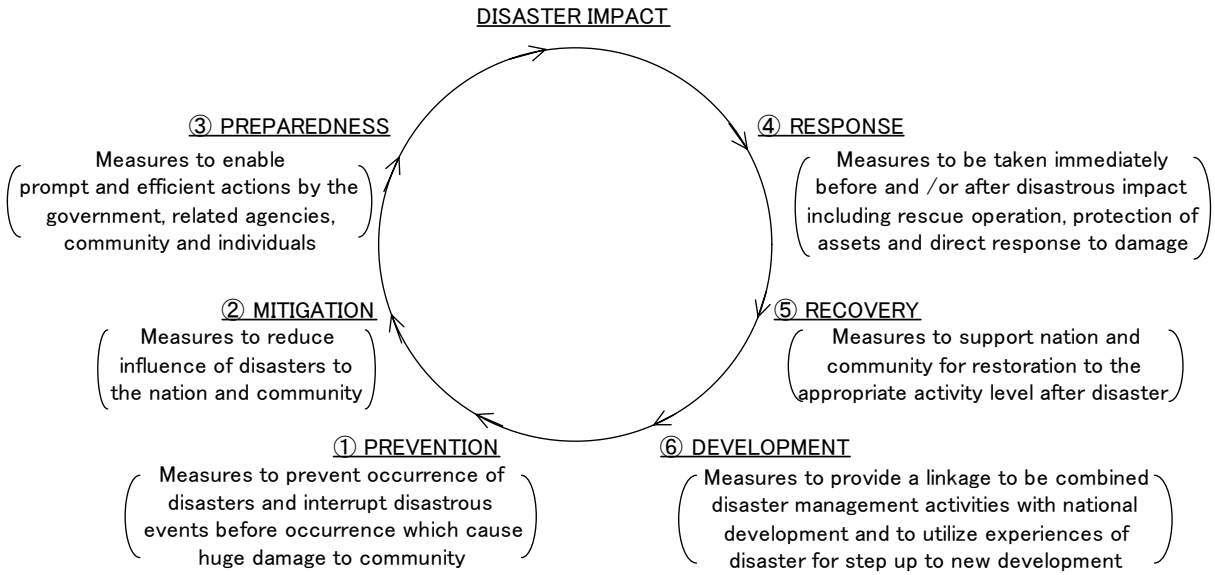
Figure 9.1 Composition of Countermeasures against Flood and Debris Disaster

(2) Overall Framework based on Disaster Management Cycle

Activities of "Disaster Management" need a concept in respective time frame in which what kind of measures is effective in the light of disaster prevention facilities and disaster management capability in the region. Although a figure of the nation with doing disaster countermeasures in all phases is delineated, it will be difficult to prevent damage up to minimum level without continuation of concrete disaster management activities in the respective flood prone areas. To involve the time frame would be very useful in preparing beneficial disaster management plan in the respective hazard prone areas having individual characteristics.

For example, it is assumed that, for the disaster management program in Metro Manila, investment for the infrastructure of flood and debris flow control and allocated manpower of governmental agencies would have a big scale. However, in case of regional cities, the magnitude should be relatively low and some regions might exist where construction of infrastructure can not be expected at all in a certain time frame.

In view of above, to contemplate cooperation programs based on the concept of "Disaster Management Cycle" is very effective. The concept is also introduced in the "Research for Forming Disaster Management Organization in Under Developing Countries (Disaster Management Bureau of Land Development Agency, 1994. 3).



Source: "Disaster Management: A Disaster Manager's Handbook, ADB, 1991"

Figure 9.2 Disaster Management Cycle

9.2 Analysis on Current Situation and Problem Identification

In Section 9.2, the current status and problems of disaster management activities (for flood and debris disaster mitigation sector) in the Philippines are mentioned. The process from identifying problems to formulation of cooperation programs (draft) is taken as follows:

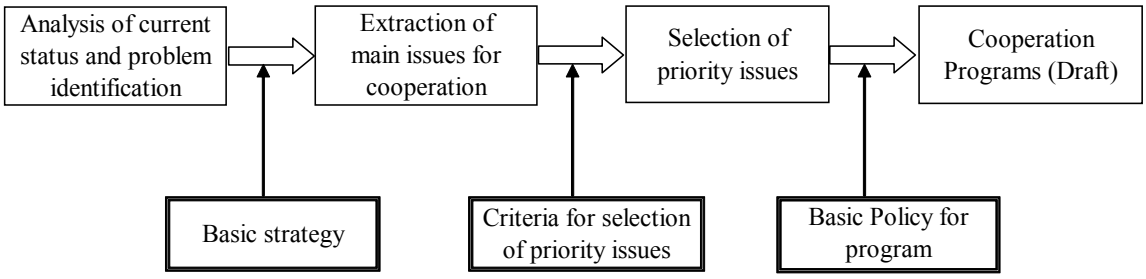


Figure 9.3 Procedure of Formulation of Cooperation Program (Draft)

Japanese government has proceeded to extend assistance in flood and debris flow prevention in the Philippines over 30 years from early 1970's. The assistance of the Japanese government in infrastructure of flood control and sabo measures in the Philippines is significant in terms of financial figures and variety of contents among various donor countries and agencies. In the department budget of DPWH with 4.0 to 5.0 billion Pesos/year, around half of the budget relied on the foreign assistance and most of that is from Japan in a decade of 1900's. After 2000, proportion of budget from foreign countries sharply became high due to deterioration of the Philippines' economy and more than 90 % of that is obliged to rely on the assistance of foreign countries (most of that is from Japan). Under such serious financial situation in the Philippines, more efficient and effective implementation of flood control and sabo measures, which are normally required a lot of budget, by limited budget are required.

On the other hand, debilitation of function in institutional and administrative capability becomes a serious problem. In particular, those for DPWH, which shares central core part in institutional and administrative function in flood control, become debilitated compared with that was several decades ago, because its activities are specialized to project implementation and no existence of divisions/sections in charge of formulating flood and debris control plans from long term aspects.

Regarding the administration of disaster management for the entire nation, there are National Disaster Coordination Council (NDCC) and clustered Disaster Coordination Councils in respective regions, cities and barangays. However, communication facilities linked with the councils and related agencies are insufficient and adequate cooperation system is not yet established. Further, disaster management plan is not formulated yet by the Disaster Coordination Councils and the direction of evacuation, etc. actually depends on own judgement by barangay or other community. Thus, appropriate information dose not be disseminated to most of the residents and increase of damage is accelerated.

Although there is the Water Code made in 1976 in the Philippines, adequate system of organization for execution based on the laws and budget is not allocated properly. In addition, regulations in the laws are not sufficient for flood control and debris flow disaster countermeasures.

As referred to the overall frame for flood and debris disaster countermeasures in Section 9.1, main issues are rearranged based on the review of past cooperation outcome by Japanese government, hearing to the personnel in related agencies (concerned person in the Philippines' government, private NGO. concerned personnel related to the Japanese Government, foreign donor agencies, regional level disaster coordination councils, etc.) workshop and questionnaire survey. Main issues extracted are shown in

Table 9.1 in Section 9.3.

9.3 Extraction of Issues on Cooperation

The main issues mentioned above are repeated and summarized below:

Table 9.1 Extraction of Issues

Main Issues	Present Condition and Problems	Issues／Program
I. Reducing Hazard (Structural Measures)	● No data base at present ● Data are currently collected by individual projects or studies ● The Philippine Government intends to adopt smaller design flood. ● Risk assessment of overtopping is necessary. ● The existing Master Plan for the major rivers is getting out of date. ● Priority projects cannot be decided. ● No Master Plan is available for small- and medium scale rivers. ● The Medium Term Investment Plan 2005-2010 of DPWH also stipulates formulation of the Master Plan. ● Completion of on-going project are delayed. ● Lack of fundamental flood and debris flow control structures ● Land acquisition problem ● Resettlement problem of people residing in river areas ● Some of the resettled illegal residents return to their original place. ● Difficulties in removal of illegal settlers ● Support from LGUs is required. ● Operation and maintenance manuals are not always prepared. ● Dumped waste impairs flow capacities of channels. ● Some of the resettled illegal residents return to their original place. ● Patrol of river structures are not always regular	**1. Plan Formulation of Flood Control and Sabo Projects** 1) Construction of Database 2) Review of Design flood 3) Overall Plan for respective river basins (formulation of Master Plan) a) Integrated river basin development b) About 40 rivers will be chosen through the first screening. c) About 20 rivers will be chosen through the second screening. d) Implementation Plan e) Overall evaluation **2. Implementation of New Projects** 1) Immediate completion of on-going projects 2) Implementation of priority projects chosen in the master plan 3) Land acquisition 4) Resettlement of people residing in river areas 5) Removal of illegal settlers **3. Operation and Maintenance of Flood Control and Sabo Structures** 1) Preparation of manuals for operation and maintenance 2) Regulation on waste disposal 3) Removal of illegal settlers 4) Regular Patrol
II. Reducing vulnerabilities (Non-Structural Measures)	● The existing FFWS is getting out of date. ● Radio communication is often disconnected. ● Insufficient information contents of the existing FFWS ● Weak operation and monitoring structures ● Limited budget for operation and maintenance ● Information obtained by FFWS has	**II. Establishment of FFWS** 1) Effective Use of Existing FFWS

Main Issues	Present Condition and Problems	Issues／Program
	been held exclusively by PAGASA, and has not been shared by other related agencies.	
	● Strengthening of evacuation system in nation-wide is necessary.	2) Formulation of FFWS Master Plan
	● The exiting FFWS is regionally limited.	3) Installation of new FFWS
	● Status of operation is not accurately grasped.	4) Monitoring of FFWS
		2. Preparation of Hazard Map
	● Hazard Map is necessary for evacuation.	1) Data collection
	● Hazard map is not available.	2) Preparation of hazard maps
		3. Strengthening of Community Disaster Mitigation
	● No Disaster Management Plan is formulated	1) Disaster Management Plan
	● Preparation of Evacuation plan is insufficient.	2) Evacuation Plan
		4. Promotion of Education and Campaign
	● Lack of sustainability is the matter.	1) Regular evacuation drill
	● Monitoring is insufficient.	2) Continuous monitoring and improvement of program
		5. Strengthening of Flood Fighting
	● Flood fighting is insufficient.	1) Promotion of public involvement
	● Know-how is lacking.	2) Cooperation and coordination with NGO
		3) Exchange of information with experienced LGUs
	● Material for activities are inadequate.	4) Storage of construction material
		6. Strengthening of Flood Plain Management
	● Peak discharges become sharp due to change of land use	1) Formulation of land use plan and endorsement as ordinance
		5. Resettlement
	● Resettled dwellers return to original areas.	1) Formulation of a resettlement plan
	● No livelihood improvement plan is available.	2) Reform of laws and regulations
	● Support of local government units is required.	3) Securing budget 4) Implementation of resettlement plan
III. Institutional Strengthening (Supporting measures)		**1. Review of Laws and Regulations**
	● The definition of river administrators is not clear.	1) Review of bylaws of the Water Code ● A river administrator and his responsibility should be defined.
	● Divisions of jurisdiction between the Central Government and LGU's are not clear	● Clear division of the river management jurisdiction between the central and local governments
	● The river area is not clearly defined	● Defining the river area
	● The river structure is not clearly defined.	● Defining the river structures
	● No regulation exists on flood fighting	● Defining the laws for flood fighting 2) Reform of the Water Code
		2. Institutional Reformation
	● No organization for water resources management exists (with integrated all aspects)	1) Option 1: Establishment of the Department of Water Resources 2) Option 2: DPWH's re-organization-1 (with concept of re-establishment of River Bureau)
	● PMOs are project-based offices, not	3) Option 3: DPWH's re-organization-2

Main Issues	Present Condition and Problems	Issues／Program
	permanent ones. Low incentives for their officers. ● Status of FCSEC is not definite.	(with concept of reform of PMO) 4) Securing staff
	● Limited budget of DPWH ● Budget allocation within DPWH (small share of flood control budget) ● Basic concept of O&M budget is lacking. ● O&M budget is not sufficient	**3. Securing Budget** 1) DPWH total budget (to increase) 2) Appropriate budget allocation within DPWH 3) Establishment of concept of O&M budget 4) Appropriate budget allocation to O&M
	● No comprehensive education ● Low incentives of staff of the existing PMOs ● No opportunity for education and trainings at actual projects	**4. Training of DPWH Staff** 1) Continuing FCSEC 2) OJT through actual projects 3) Developing project managers 4) Developing staff with aim to be the core of the organisation in the flood and debris control sector in the future
	● Research and development (R & D) of river engineering technology are not progressed ● Development owned by the Philippine side is few. ● Efficient R & D with low cost is not available.	**5. Enhancement of Research and Development Capability** 1) Forming research and development (R & D) organization 2) Selection of subjects for R & D. 3) Promoting cooperation and coordination between government, academia and private sectors.
	● New flood and debris control measures are required. ● Problems in water utilization between upstream and downstream areas are unsolved. ● There is no mechanism for accumulation of knowledge and sharing information	**6. Enhancement of Comprehensive and Integrated Countermeasures** 1) Enhancement of comprehensive flood control measures 2) Enhancement of integrated water resources management **7. Accumulation of knowledge and Construction of Information Sharing System**
	● There is no opportunity to apply ● No progress of application to other offices and related agencies	**8. Preparation of Technical Standards and Guidelines** 1) Application to Pilot Projects 2) Dissemination to Regional and District Offices and LGUs

9.4 Selection of Priority Issues

(1) Criteria for selecting Priority Issues

The criteria for selecting priority issues are given as follows:

1) Issues for strengthening community disaster mitigation
2) Urgent and important issues
3) Special or highly technical issues

(2) Selection of Priority Issues

Table 9.2 shows the principal issues (listing further detailed issues as required) and among the issues priority ones are selected. The following symbol marks are used in the table below:

Criteria for selecting priority issues

- ◎ : Issues with high priority requirement (Philippine Government/People are directly involved)
- ○ : Issues required with moderate importance (Philippine Government/People are involved indirectly)
- △ : Issues required with low priority (Philippine Government /People are well informed)
- ▲ : Issues in which the Philippine Government / People find it difficult to join)

Issues for Cooperation by GOJ

- ◎ : GOJ should cooperate for the most part
- ○ : GOP/People should implement by their initiative. GOJ should support when required.
- △ : GOP should be a main stakeholder and GOJ should give a technical assistance when required.
- ▲ : GOJ finds it difficult or impossible to join. GOP should implement independently.

Implementation Schedule

- ◎ : As applicable in mid-term implementation (2005~2010)
- ○ : As applicable in long-term implementation (~2020)

The issues in which "Cooperation by GOJ" and "Mid-term implementation" are both evaluated as "◎" are selected as priority ones to be positively implemented by GOJ. Regarding the activities for response and recovery after disaster, they should be implemented as required in the mid- and long-term and excluded from selection of priority issues for formulation of cooperation programs.

Table 9.2 Selection of Priority Issues

Issues	Priority Issues Selection Criteria			Cooperation by GOJ	Implementation Schedule	
	Community Program	Urgency / Importance	Highly Technical		Mid Term	Long Term
I. Installation and O/M Management of Flood Control and Sabo Structures						
1.1 Overall Plan for respective river basins (formulation of Master Plan)	△	◎	◎	◎	◎	
1.2 Review of Design Flood	△	◎	◎	◎	◎	
1.3 Feasibility Study on selected Project(s)	△	◎	◎	◎	◎	
1.4 Construction of Database	○	◎	◎	◎	◎	
1.5 Implementation of Projects	○	○	◎	◎	◎	○
1) On-going Project	○	◎	◎	◎	◎	

2) Implementation of New Projects	○	○	○	○		○
3) Land Acquisition	◎	◎	○	▲	◎	
4) Resettlement	◎	◎	○	○	◎	
5) Removal of Illegal Settlers	◎	◎	○	○	◎	
1.6 O&M of Flood Control and Sabo Structures	◎	◎	○	◎	◎	
1) Preparation of O&M Manual	△	◎	○	◎	◎	
2) Regulation on Waste Disposal	◎	◎	○	▲	◎	
3) Removal of Illegal Settlers	◎	◎	○	○	◎	
4) Patrol of River Structures	◎	◎	○	△	◎	
5) Flood fighting activities	◎	◎	○	△	◎	
II. Strengthening of Non-Structural measures						
2.1 Establishment of FFWS	○	○	◎	◎	◎	
1) Effective use of existing FFWS	△	○	◎	◎	◎	
2) Formulation of FFWS Master Plan	○	○	◎	◎	◎	
3) Installation of New FFWSs	△	○	◎	◎		○
4) Monitoring of FFWS	△	○	◎	○	◎	
2.2 Preparation of Hazard Map	◎	○	◎	◎	◎	○
1) Data collection	○	○	◎	○	◎	○
2) Preparation of Hazard Maps	◎	○	◎	◎	◎	○
2.3 Strengthening of Community Disaster Mitigation	◎	○	◎	▲		○
1) Disaster Management Plan	◎	○	◎	▲		○
2) Evacuation Plan	◎	○	◎	▲		○
2.4 Promotion of Education and Campaign	◎	△	○	△	◎	○
1) Regular evacuation drill	◎	△	○	△	◎	○
2) Continuous monitoring and improvement of program	◎	△	○	△	◎	○
2.5 **Strengthening of Flood Fighting**	◎	◎	○	○	◎	
1) Promotion of public involvement	◎	◎	○	△	◎	
2) Cooperation and coordination with NGO and LGU	◎	◎	○	△	◎	
2.6 Strengthening Flood Plain Management	○	○	◎	◎		○
1) Formulation of land use plan and endorsement as ordinance	○	○	◎	◎		○
2.7 Resettlement	◎	◎	◎	○	◎	○
1) Formulation of resettlement plan	◎	◎	◎	○	◎	○
2) Reform of laws and regulations	◎	◎	◎	▲	◎	○
3) Securing budget	◎	○	◎	▲		○

4) Implementation of resettlement plan	◎	○	◎	▲		○
III. Institutional Strengthening						
3.1 Review of Laws and Regulations	▲	○	○	◎	◎	
1) Review of bylaws of the Water Code	▲	○	○	○	◎	
2) Reform of the Water Code	▲	○	○	○	◎	
3.2 Organizational Reform	▲	◎	◎	◎	◎	○
1) Establishment of Department of Water Resources	▲	◎	◎	○		○
2) Re-organization of DPWH-1 (Re-establishment of River Bureau)	▲	◎	◎	○		○
3) Re-organization of DPWH-2 (Reform of PMO organization)	▲	◎	◎	◎	◎	
4) Securing staff	▲	◎	◎	○	◎	
3.3 Securing Budget	▲	◎	○	▲	◎	
1) DPWH total budget	▲	◎	○	▲	◎	
2) Budget allocation within DPWH	▲	◎	○	▲	◎	
3) Establishment of concept of O& M budget	▲	◎	○	▲	◎	
4) Appropriate budget allocation to O&M	▲	◎	○	▲	◎	
3.4 Training of DPWH Staff	▲	○	◎	◎	◎	
1) Continuing FCSEC	▲	○	◎	◎	◎	
2) OJT through actual projects	▲	○	◎	◎	◎	
3) Developing Project Manager	▲	○	◎	◎	◎	
4) Developing staff with aim to be the core of the organization in the flood and debris control sector in the future	▲	○	◎	◎	◎	
3.5 Enhancement of Research and Development Capability	▲	◎	◎	◎	◎	○
1) Forming research and development (R&D) organization	▲	◎	◎	○	◎	○
2) Selection of subjects for R&D	▲	◎	◎	◎	◎	○
3) Promoting cooperation and coordination between government, academia and private sectors	▲	◎	○	○	○	○
3.6 Enhancement of Comprehensive and Integrated Countermeasures	▲	◎	◎	◎	◎	○
1) Enhancement of comprehensive flood control measures	▲	◎	◎	◎	◎	○
2) Enhancement of Integrated Water Resources Management	▲	◎	◎	◎	◎	○
3.7 Accumulation of Knowledge and Construction of Information Sharing System	▲	◎	○	◎	◎	○

3.8 Preparation of Technical Standards and Guidelines	▲	◎	◎	◎	◎	
1) Application to Pilot Projects	▲	◎	◎	◎	◎	
2) Dissemination to Regional and District Office and LGUs	▲	○	○	△	◎	○

As shown in the above table, 15 (fifteen) priority issues with a symbol of "◎" were selected (both "Cooperation by GOJ" and "Mid-Term implementation" are "◎". The results are summarized below:

Table 9.3 Summary of Priority Issues

Issues	Evaluation	Note
I. **Installation and O/M Management of Flood Control and Sabo Structures**		
1.1 Overall Plan for respective river basins (formulation of Master Plan)	Topmost priority	
1.2 Review of Design Flood	Topmost priority	
1.3 Feasibility Study on selected Project(s)	Topmost priority	- To be included in "Establishment of FFWS", since this issue is related with "Preparation of Hazard Map".
1.4 Construction of Database	Topmost priority	
1.5 Implementation of Projects	Topmost priority	- To proceed on-going projects with higher priority and to implement new projects in long-term schedule.
1.6 O&M of River Structures	Topmost priority	
II. Establishment of FFWS		
2.1 Establishment of FFWS	Topmost priority	Formulation of FFWS Master Plan and effective use of existing FFWS (excluding installation of new FFWS and monitoring of FFWS)
2.2 Preparation of Hazard Map	Topmost priority	
2.3 Strengthening of Community Disaster Mitigation	-	GOP should implement by their initiative and GOJ should advise when required.
2.4 Promotion of Education and Campaign	-	GOP should implement by their initiative and GOJ should advise when required.
2.5 Strengthening of Flood Fighting	-	GOP should implement by their initiative and GOJ should advise when required.
2.6 Strengthening Flood Plain Management	-	To be included in "Enhancement of Comprehensive and Integrated Measures"
2.7 Resettlement	-	GOP should implement by their initiative and GOJ should advise when required.
III. Institutional Strengthening		
3.1 Review of Laws and Regulations	Topmost priority	GOP should implement by their initiative and GOJ should advise when required.
3.2 Institutional Reformation	Topmost priority	GOP should implement by their initiative and GOJ should advise when required. (DPWH's re-organization -2: Reform of PMO Organization)
3.3 Securing Budget	-	
3.4 Training of DPWH Staff	Topmost priority	GOP should implement by their initiative and GOJ should advise when required.
3.5 Enhancement of Research and Development Capability	Topmost priority	
3.6 Enhancement of Comprehensive and	Topmost priority	

3.7 Integrated Measures Accumulation of Knowledge and Construction of Information Sharing System	Topmost priority	
3.8 Preparation of Technical・・・ Standards and Guidelines	Topmost priority	GOP should implement by their initiative and GOJ should advise when required.

9.5 Outline of Cooperation Programs (Draft)

(1) Program Formulation

The following three basic policies were applied throughout the program formulation for the flood and debris disaster sector:

- Basic Policy 1 : Programs should be expected to have positive impacts on the entire flood and debris flow sector.
- Basic Policy 2 : Programs should be appropriate for the current financial situation of the Philippines.
- Basic Policy 3 : Programs should be able to intensify and complement the effects and achievements of past and on-going Japanese aid projects.

The following points have been considered for examining direction, approach and contents of cooperation programs for the flood and debris disaster sector, corresponding to the above three basic policies respectively:

- Consideration 1 : Cooperation should contribute to the institutional strengthening of the flood and debris flow sector.
- Consideration 2 : Cooperation should encourage self-help of the Philippines so as to be sustainable.
- Consideration 3 : Cooperation should contribute to diffusion of technologies and knowledge transferred from Japan.

Based on the basic policies and considerations, 14 priority issues, which are extracted in Section 9.4, are categorized into related issues, four cooperation programs (draft) were formulated as below. Figure 9.4 schematically presents the positioning of the formulated cooperation programs (Draft) among the priority issues discussed in the previous Section.

Forwarding of comprehensive and integrated measures which is set in the enhancing institutional and administrative capability of the flood and debris flow sector, was constituted individual cooperation program due to consideration of wide scope of technical contents to issues, many coordination agencies during implementation, easiness of evaluation and monitoring to progress and achievement in future and so on. Relation between the cooperation program and priority issues is shown in Table 9.4.

Table 9.4 Outline of Cooperation Program (Draft) (Flood and Debris Disaster Sector)

No.	Cooperation Program (Draft)	Priority issues included in the Program (draft)
1	Program for Enhancement of Construction, Operation and Maintenance of Flood Control and Sabo Structures	1.1 Formulation of Flood Control Plan for respective river basins (formulation of Master Plan) 1.2 Review of design flood 1.3 Feasibility Study on selected project(s) (F/S) 1.4 O & M of flood control and sabo structures
2	Program for Enhancement of Evacuation Systems	2.1 Establishment of FFWS 2.2 Preparation of hazard maps 2.3 Construction of database
3	Program for Institutional Strengthening of Flood Management	3.1 Review of laws and regulations 3.2 Organizational reform (DPWH's re-organization-2: Reform of PMO organization) 3.3 Training of DPWH staff 3.4 Enhancement of research and development capability 3.5 Accumulation of knowledge and construction of information sharing system 3.6 Preparation of technical standards and guidelines
4	Program for Enhancement of Comprehensive and Integrated Countermeasures	4.1 Enhancement of comprehensive flood control measures (including strengthening of flood plain management) 4.2 Enhancement of integrated water resources management

(2) Positioning of Cooperation Programs (Draft) in Disaster Management Cycle

Based on the disaster management cycle mentioned in Section 9.1, the selected priority issues for cooperation can be classified as follows:

Table 9.5 Relationship between Priority Issues and Disaster Management Cycle

Issues	Evaluation Result	Classification in Diaster Management Cycle (6 measures)					
		Prevention	Mitigation	Preparedness	Response	Recovery	Development
I. Enhancement of Construction, Operation and Maintenance of Flood Control and Sabo Structures							
1.1 Overall Plan for respectiveriver basins (formulation of Master Plan)	Topmost Priority	■	■				
1.2 Review of Design Flood	Topmost Priority	■					
1.3 Feasibility Study on selected Project(s)	Topmost Priority	■	■	■			
1.4 Construction of database	Topmost Priority	■					
1.5 Implementation of Projects	Topmost Priority	■	■	■			■
1.6 O&M of River Structures	Topmost Priority	■					
II. Enhancement of Evacuation System							
2.1 Establishment of FFWS	Topmost Priority		■	■			
2.2 Preparation of Hazard Map	Topmost Priority			■			
2.3 Strengthening of community disaster mitigation	-	■	■	■			
2.4 Promotion of education and campaign	-			■			
2.5 Strengthening of flood fighting	-			■	■		
2.6 Strengthening Flood Plain Management	-		■				
2.7 Resettlement	-	■	■	■			
III. Institutional Strengthening of Flood Management							
3.1 Review of laws and regulations	Topmost Priority	■	■	■	■	■	■
3.2 Organizational reform	Topmost Priority		■	■			
3.3 Securing budget	-						■
3.4 Training of DPWH staff	Topmost Priority	■	■	■	■	■	■
3.5 Enhancement of research and development capability	Topmost Priority			■			
3.6 Enhancement of comprehensive and integrated countermeasures	Topmost Priority	■	■	■			
3.7 Accumulation of knowledge and construction of information sharing system	Topmost Priority			■			■
3.8 Preparation of technical standards and guidelines	Topmost Priority	■	■	■			■
● Response						■	
● Recovery						■	
● Development						■	

Remarks: ■, Related cycle

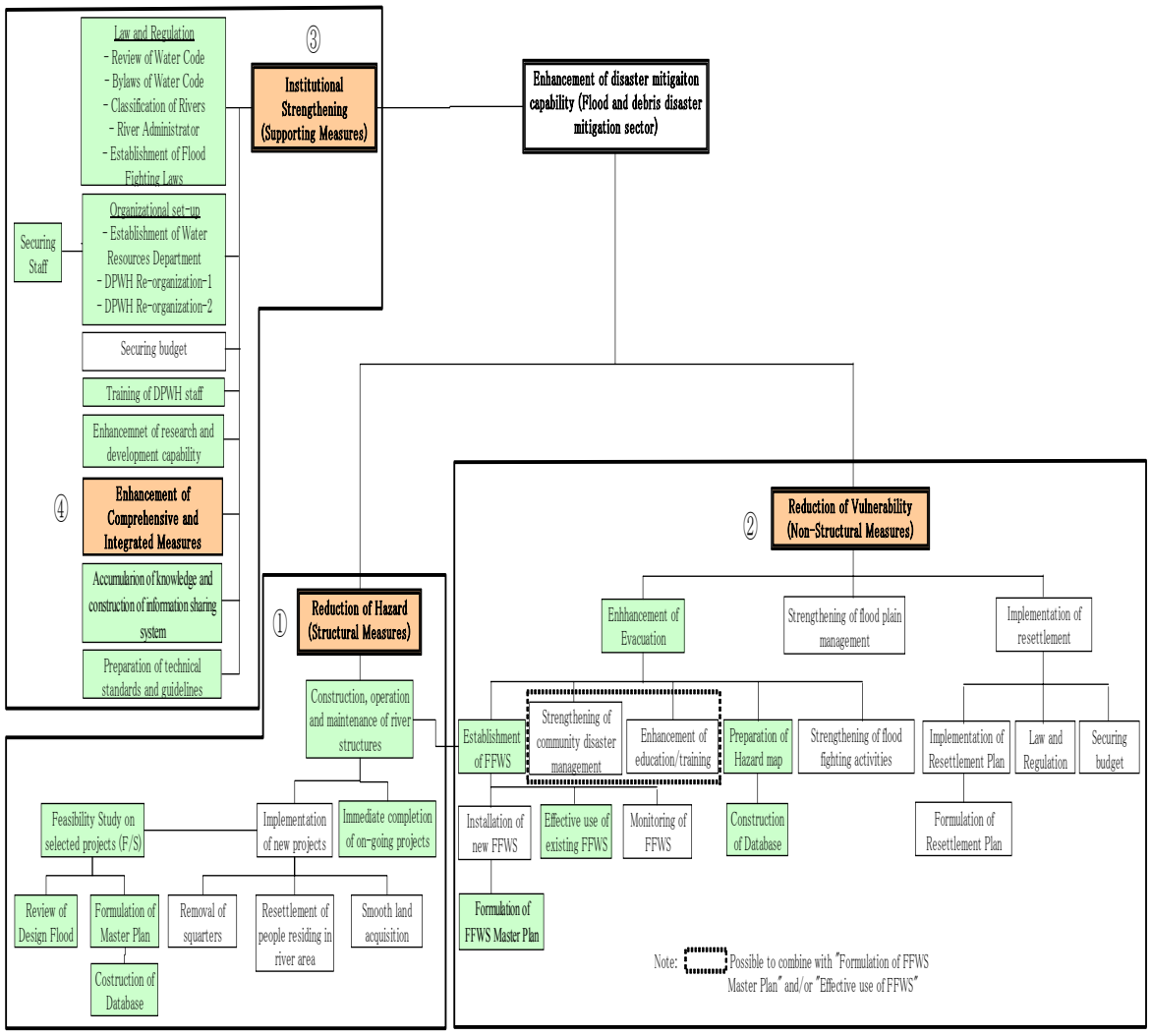
Note: Relationship between respective issues and category of disaster maangement cycle will vary subject to concrete activities. The table above shows general view of classificaiton in common activities.

9.6 Direction of Cooperation in Long-Term

The target in long-term is set up that the Government of the Philippines become to be able to manage the disaster mitigation activities independently by year 2020. The cooperation in development of new technology, urgent countermeasures and recovery after disasters shall be continued onward as required. The direction in long-term cooperation is summarized below:

Table 9.6 Direction in Long-Term Cooperation (Draft) (Flood and Debris Disaster Mitigation Sector)

Category	Priority Issues	Direction in Long-term Cooperation
Reducing hazard magnitude (Structural Measures)	Implementation of new projects	Support to promote the priority projects, which are selected in the Flood Control Master Plan and plan of sabo works, should be continued. In addition, support for review of the Flood Control Master Plan every a decade, which is formulated in "Mid-term Direction", setting target, updating of basin properties, evaluation of executed projects and review of priority of projects should be also continued.
Reducing vulnerability (Non-Structural Measures)	Installation of new FFWS	Taking account the organization for operation and maintenance, support for installation of new FFWS should be conducted.
	Construction of database	In order to continuously maintained and updated the database system, constructed in the "Mid-term Direction", by the Philippine side, support should be extended.
	Preparation of hazard maps	Based on the experiences in the "Mid-term Direction", support to prepare further effective hazard maps should be continued in aspect of disaster mitigation.
	Strengthening of community disaster mitigation	By means of the hazard maps prepared in the "Mid-term Direction", support for updating the Disaster Management Plans and Evacuation Plan should be conducted.
	Promotion of education and campaign	Support for improvement of activities conducted in the "Mid-term Direction", introduction of new technology, applying to other regions, etc. should be continued.
	Strengthening of flood plain management	Support should be continued in new project implementation, and accumulation of knowledge and human resources development should be promoted.
	Resettlement	Based on the achievement and evaluation of the effects in this field though the "Mid-term Direction", effective support should be continued.
Institutional strengthening (Supporting Measures)	Institutional reformation	As for the "Mid-term Direction", re-organization of DPWH-2 (reform of PMO) is recommended. However, the Long-term Direction of cooperation should be looked for to support establishing the Department of Water Resources to strengthen entire administration of water resources.
	Enhancement of research and development capability	Based on the achievement of activities in the "Mid-term Direction", support to assist further self-reliant and sustainable activities of research and development should be continued.
	Enhancement of comprehensive and integrated countermeasures	Major support activities should be shifted from preparation of guidelines and re-organization for institutional reform in the "Mid-term Direction" to applying in actual flood control and sabo projects. Support for planning and operation by the Philippine side should be conducted in connection with activities for institutional reformation,
	Accumulation of knowledge and construction of information sharing system	Based on the evaluation of the activities in the "Mid-term Direction", support for propagation and coordination to relate agencies should be further continued.
	Preparation of technical standards and guidelines	The area of activities should be extended to the regional and district offices, and support for improvement of the contents should be conducted.



Priority issues (Draft)

No.	Program Name	Contents of Program	
1	Program for Enhancement of Construction, Operation and Maintenance of Flood Control and Sabo Structures	1.1	Formulation of flood control plan for respective river basins (formulation of Master Plan)
		1.2	Review of Deasign Flood
		1.3	Feasibility Study on selected projects (F/S)
		1.4	O & M of flood control and sabo structures
2	Program for Enhancement of Evacuation Systems	2.1	Establishment of FFWS
		2.2	Preparation of hazard maps
		2.3	Construction of database
3	Program for Institutional Strengthening for Flood Management	3.1	Review of laws and regulations
		3.2	Organizational reform (DPWH's re-organization-2: Reform of PMO organization)
		3.3	Training of DPWH staff
		3.4	Enhancement of research and development capability
		3.5	Accumulation of knowledge and construction of information sharing system
		3.6	Preparation of technical standards and guidelines
4	Enhancement of Comprehensive and Integrated Countermeasures	4.1	Enhancement of comprehesive flood control measures (including strengthening of flood plain management)
		4.2	Enhancement of integrated water resources management

Figure 9.4 Relationship of Cooperation Program

CHAPTER 10

GENERAL VIEW OF COOPERATION PROGRAM (DRAFT) (EARTHQUAKE DISASTER MITIGATION SECTOR)

10.1 Basic Understanding

The Philippines has experienced many types of natural disasters such as typhoon, drought, flood, volcanic eruption, earthquake, and tsunami. Above all, earthquake is the most threatening event to human life, property, society and the economy. Furthermore, earthquakes will have a negative impact on poverty alleviation and sustainable development. In the case of a catastrophic earthquake happening in the vicinity of Metropolitan Manila, it is estimated that it would affect not only the Capital region but also the whole future of the Philippines.

With such a background, "Reduction of the earthquake disaster risk of the Philippines" has been set as the super goal, and to achieve this super goal, six goals have been set. Thus, issues which the Philippines need to tackle were listed, and from this list priority issues were selected. Moreover, for the priority issues, draft cooperation programs were designed and mid and long-term cooperation visions were delineated. The JICA assisted master plan study, "Earthquake Impact Reduction Study in Metro Manila" (MMEIRS), conducted during 2002-2004 was referred to and its outputs have been utilized in setting issues. The flow of the Current Study has been as shown in Figure 10.1.

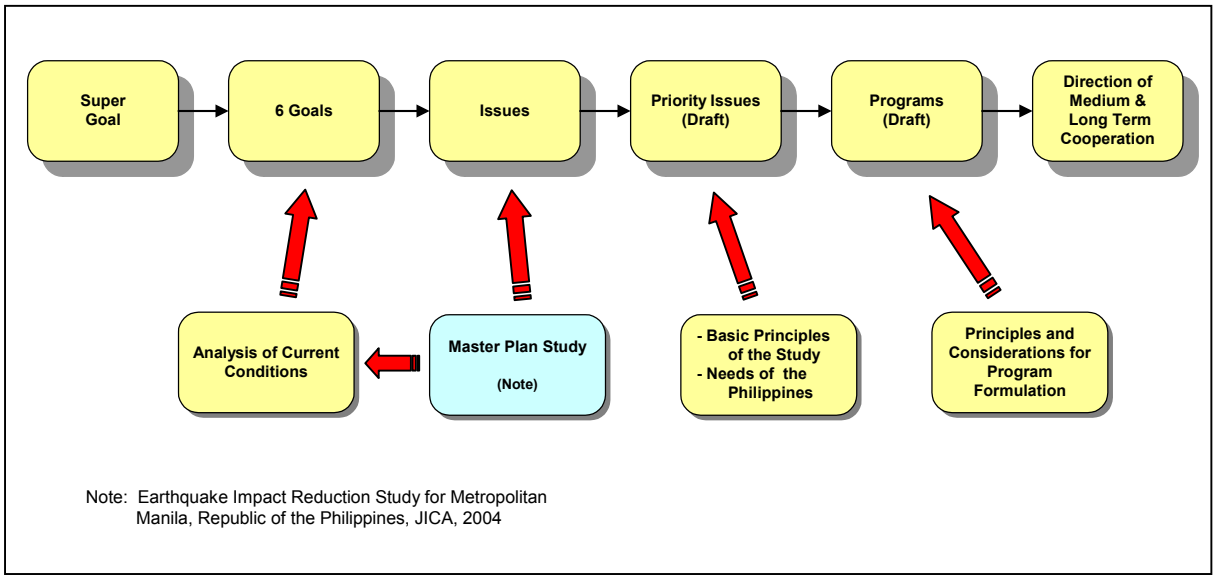


Figure 10.1 Flow of the Study, Earthquake Disaster Mitigation Sector

Five suggested cooperation programs have been illustrated in the overall framework of the earthquake disaster risk reduction of the Philippines.

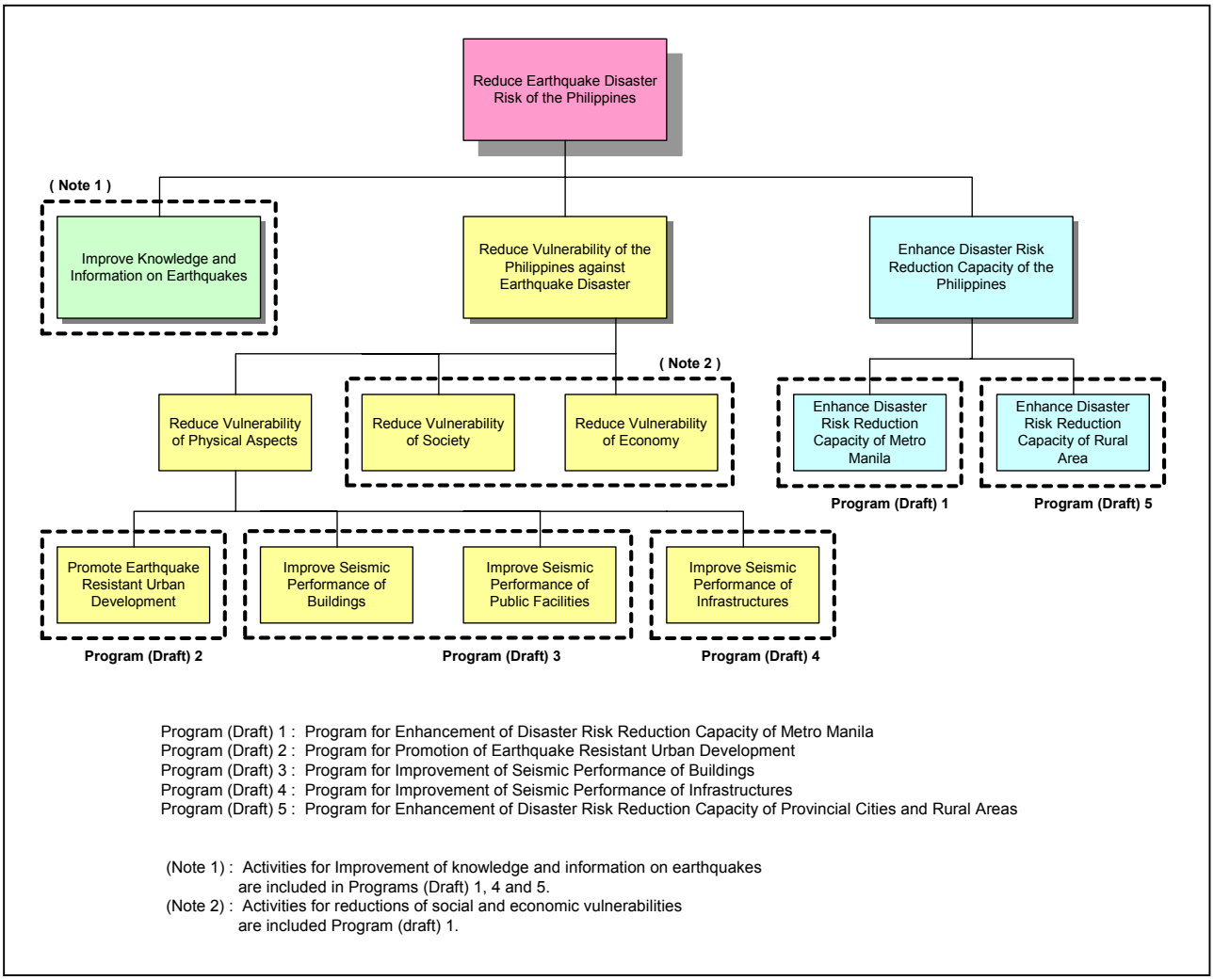


Figure 10. 2 Position of the Programs (Draft) within the Framework of the Earthquake Disaster Mitigation Sector

10.2 Analysis on Current Situation and Problem Identification

By studying the outputs of the MMEIRS（JICA, 2004）and results of the interviews, workshops, and follow-up questionnaire survey of the Study, status analysis and problem identification were conducted in three fields, namely 1) information about earthquake as an external force, 2) earthquake vulnerability of the Philippines, 3) coping capacities to earthquake disaster of the Philippines. By these analyses, six goals for earthquake impact reduction have been set as the start of the Study（Table 10.1）.

For Goals 1 to 4 the target is Metropolitan Manila, while objective 5 is for provincial cities and rural areas. Objective 6 benefits both the capital region and provinces.

Table 10.1 Objectives to reduce earthquake disaster risks

Super Goal	Goal	
Reduction of Earthquake Disaster Risk of the Philippines	Goal 1	Enhancement of disaster risk reduction capacity for Metro Manila
	Goal 2	Promotion of earthquake resistant urban development
	Goal 3	Improvement of seismic performance of buildings
	Goal 4	Improvement of seismic performance of public facilities and infrastructure
	Goal 5	Enhancement of disaster risk reduction capacity of rural areas
	Goal 6	Promotion of research on earthquake disaster

10.3 Extraction of Issues on Cooperation

Forty issues that have been identified in the MMEIRS, which were considered as important and urgent, have been set as cooperation issues in this Study.

In MMEIRS, one hundred and four issues, or action plans, were proposed by utilizing the results of the damage estimation and various types of information, aiming to reduce earthquake disaster risk and to establish a safer Metropolitan Manila against earthquake. The issues to be taken cover are non structural and structural measures in the phases of disaster preparedness and mitigation, emergency response and operations, recovery and reconstruction. The implementing agents include central government, local governments, communities, and the private sector. In particular, activities in the preparedness and mitigation phase have been categorized into political and public administrative commitment, awareness raising, knowledge development and information management, monitoring and warning, and implementing countermeasures.

Furthermore, MMEIRS selected forty issues, or action plans, out of one hundred and four issues. The priority issues in the Current Study were basically selected from these forty issues.

Forty tasks were categorized under six goals and shown in Table 10.2. In the first goal, Enhancement of Disaster Risk Reduction Capacity for Metro Manila, issues were categorized into the different levels of participants, namely national, capital region, city and municipality, community, and private sectors. However, issues for the fifth goal, which is “Enhancement of Disaster Risk Reduction Capacity of Rural Areas”, are not included in MMEIRS.

Table 10.2 Issues (Action Plans) Selected by MMEIRS

Goal 1: Enhancement of Disaster Risk Reduction Capacity for Metro Manila	
National Level	
Issues (Action Plans)	Strategy
Strengthen legal basis for disaster management at the national level by updating/replacing PD1566	Enhance legal basis for disaster management
Enhance organizational response capacities	Enhance emergency health and medical response system
Improve government hospital capacities	
Enhance logistics and medical supplies	
Metropolitan Manila	
Issues (Action Plans)	**Strategy**
Promote the reorganization and revitalization of city/municipal and barangay Disaster Coordinating Councils	Strengthen institutional capacity for mitigation, preparedness and response
Strengthen MMDCC by updating its structure and organizing and implementing a MMDCC Work Plan	Strengthen inter-institutional coordination
LGU	
Issues (Action Plans)	**Strategy**
Strengthen legal basis at the local level by adopting model city/municipal ordinances	Enhance legal basis for disaster management
Promote local government disaster mitigation planning through implementation of the Earthquake Mitigation Handbook and the Earthquake Mitigation and Response Checklists -- Local Planning Guide	Strengthen institutional capacity for mitigation, preparedness and response
Conduct training needs assessment and develop capacity building programs for local and barangay DCCs	
Encourage local emergency response planning through use of the Earthquake Mitigation and Response Checklists --- Local Planning Guide	
Encourage adoption and utilization of Emergency Response Pocket Guide and Guide for Managing Information by agencies and LGUs	
Encourage inter-local cooperation through zonation of LGUs and Mutual Aid Agreements	Strengthen inter-institutional coordination
Formulate emergency supply system for water, (food, and other necessities)	Secure emergency supply
Barangay (Community)	
Issues (Action Plans)	**Strategy**
Knowledge development about earthquake hazards and vulnerabilities	Enhance self reliant and mutual help for efficient risk management capacity
Enhance the community governance and linkage with LGUs	
Enhance potential emergency management capacities	
Enhance the administrative system supporting community activities	
Enhance school risk management capacity	Inculcate a disaster mitigation culture in future generations
Inculcate a disaster mitigation culture in future generations	
Tie down and stabilize propane cylinders against earthquake shaking	Avoid fire outbreaks from residential buildings
Promote replacement to unbreakable (plastic-bottled) gasoline vending	

Public Sector	
Issues (Action Plans)	**Strategy**
Enhance emergency measures by businesses	Protect stability of socio-economic system
Enhance safety of online financial services	
Enhance disaster finance system	
Goal 2: Promotion of Earthquake Resistant Urban Development	
Issues (Action Plans)	**Strategy**
Promote subdivision development procedures	Promote urban reform and disaster resistant urban development
Promote disaster resistant urban development / re-development	
Enforce and develop laws and regulations related to urban planning	
Promote urban reform around the nationally important facilities	
Goal 3: Improvement of Seismic Performance of Buildings	
Issues (Action Plans)	**Strategy**
Enforce and develop laws and regulations related to building codes	Strengthen buildings against earthquake
Research and development on strengthening buildings	
Promote construction and improvement for earthquake resistant buildings	
Goal 4: Improvement of Seismic Performance of Infrastructures	
Issues (Action Plans)	**Strategy**
Enhance continuity of national government function with the President's office	Protect stability of national government buildings
Establish emergency road network	Establish emergency transportation system
Secure road between Batangas Port and Metropolitan Manila south region	
Convert one portion of Manila port to earthquake resistant construction	
Secure road between Subic port / Clark field and Metropolitan Manila North region	
Construct Laguna de bay northern shore unloading facility	
Secure Ninoy Aquino airport function	
Secure the large scale water source for drinking	Secure water
Goal 5: Enhancement of Disaster Risk Reduction Capacity of Rural Area	
Issues (Action Plans)	**Strategy**
MMEIES（JICA, 2004） did not cover this objective	-
Goal 6: Promotion of Research on Earthquake Disaster	
Issues (Action Plans)	**Strategy**
Evaluate activity of the valley fault system	Propel research and technology development on earthquake impact reduction

N.B: In MMEIRS（JICA, 2004）, strengthening legal system of building code and urban development is categorized in one task. However, in this report it was divided into two tasks.

10.4 Selection of Priority Issues

Priority issues were selected by examining forty tasks which were selected in the MMEIRS and tabulated in Table 10.2. Additions and deletions have been made flexibly, based on the Basic Policy of the Study identified in Section 1.3 and the new approaches for disaster management in the Philippines set by NDCC, 2004.

Priority issues under each goal have been listed in Table 10.3.

Table 10.3 List of Draft Cooperation Issues: Earthquake Disaster Mitigation Sector

Super Goal	Goals	Priority Issues (Draft)
Reduction of Earthquake Disaster Risk of the Philippines	Enhancement of Disaster Risk Reduction Capacity of Metro Manila	■ High Level Advocacy Program ■ Promotion of Communication Among National Government, LGU and Community ■ Enhancement of Disaster Risk Reduction Capacity of LGUs ■ Enhancement of Disaster Risk Reduction Capacity of Barangays (Communities)
	Promotion of Earthquake Resistant Urban Development	■ Promotion of Sustainable Growth of Metro Manila
	Improvement of Seismic Performance of Buildings	■ Improvement of Seismic Performance of Buildings ■ Retrofitting of a Symbolic Building
	Improvement of Seismic Performance of Infrastructure	■ Improvement of Seismic Performance of Infrastructure ■ Risk Reduction of Dams ■ Introduction of Risk Reduction Concept into Development Projects
	Program for Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas	■ Hazard and Risk Mapping of the Philippines
	Promotion of earthquake research	■ Evaluation of Earthquake Disaster Risk 1 (Investigation of Active Faults) ■ Evaluation of Earthquake Disaster Risk 2 (Preparation of Disaster Management Plan for Tsunami) ■ Promotion of Earthquake Information Transfer and Dissemination System

10.5 Outlines of Cooperation Programs（Draft）

The design of cooperation programs has been conducted based on the following overall basic principles.

- Principle 1 : Programs that assist in promoting activities under local initiatives for disaster risk reduction
- Principle 2 : Programs that develop the sustainable disaster risk reduction capacity of the Philippines
- Principle 3 : Programs that integrate the disaster risk reduction concept into development.

The following points have been considered to decide direction, approach, and contents of cooperation programs.

- Consideration 1 : Cooperation that matches capacities of public administrations and communities
- Consideration 2 : Cooperation that encourages multi-sectoral and holistic approaches
- Consideration 3 : Cooperation that raises political and public administrative will, and raises awareness of residents and private sector organisations
- Consideration 4 : Cooperation that will focus on soft oriented measures
- Consideration 5 : Continuation of cooperation on disaster management activities by the Government of Japan.

Cooperation programs（draft）and priority issues, which should be tackled in each program, were listed in Table 10.4. The programs link with six goals for earthquake disaster risk reduction. However, the three priority issues (draft) for the goal 6 (earthquake research) were allocated to the other programs. So, the total number of programs is now five.

In the implementation stage, the “Program for Enhancement of Disaster Risk Reduction Capacity of Metro Manila” and the “Program for Improvement of Seismic Performance of Buildings” can be simultaneously conducted under one program. It is more rational to implement “Improvement of Seismic Performance of Buildings” as a sub-program of “Enhancement of Disaster Risk Reduction Capacity of Metro Manila”, since the activities are directly linked with activities of LGUs and barangays. Furthermore, the main activities in the program of “Improvement of Seismic Performance of Buildings” are soft oriented activities, assisting and encouraging local initiatives.

Table 10.4 Cooperation Programs (draft) : Earthquake Disaster Mitigation Sector

No	Cooperation Programs（Draft）	Priority Issues in the Programs（Draft）
1	Program for Enhancement of Disaster Risk Reduction Capacity of Metro Manila	1.1 High Level Advocacy Program 1.2 Promotion of Communication Among National Government, LGU and Community 1.3 Enhancement of Disaster Risk Reduction Capacity of LGUs 1.4 Enhancement of Disaster Risk Reduction Capacity of Barangays (Communities) 1.5 Promotion of Earthquake Information Transfer and Dissemination System
2	Program for Promotion of Earthquake Resistant Urban Development	2.1 Promotion of Sustainable Growth of Metro Manila
3	Program for Improvement of Seismic Performance of Buildings	3.1 Improvement of Seismic Performance of Buildings 3.2 Retrofitting of a Symbolic Building（Demonstration Project）
4	Program for Improvement of Seismic Performance of Infrastructure	4.1 Improvement of Seismic Performance of Infrastructure 4.2 Risk Reduction of Dams 4.3 Evaluation of Earthquake Disaster Risk (Investigation of Active Faults) 4.4 Introduction of Risk Reduction Concept into Development Projects
5	Program for Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas	5.1 Hazard and Risk Mapping of the Philippines 5.2 Evaluation of Earthquake Disaster Risk 2（Preparation of Disaster Management Plan for Tsunami）

Outlines of the programs are described in Chapter 11.

10.6 Direction of Cooperation in Long-Term

Long-term activities are required to reduce the earthquake risk in the Philippines. The long–term cooperation direction of the Japanese government, viz. six goals that were defined in this Study, is listed in Table 10.5.

Table 10.5 Direction in Long–Term Cooperation (Draft)

Earthquake Disaster Management

Super Goal	Goal	Short and mid-term activities	Long-term vision
Reduction of Earthquake Disaster Risk of the Philippines	Enhancement of Disaster Risk Reduction Capacity of Metro Manila	■ Development of methodology and tools for programs and activities. • Raising awareness and will • Encourage cooperation and coordination between local government and community • Increase disaster risk reduction capacity of local governments • Increase disaster risk reduction capacity of community ■ Development of strategy and action plan to expand the programs and activities throughout Metro Manila and the nation	■ Assistance to enhance legal framework, institutional arrangement, and disaster management planning at national level ■ Monitoring of the following programs and activities carried out throughout Metro Manila and the nation • Encourage cooperation and coordination between local government and community • Increase disaster risk reduction capacity of local governments • Increase disaster risk reduction capacity of community
	Promotion of Earthquake Resistant Urban Development	■ Assistance to promote sustainable growth of Metropolitan Manila • Preparation of master plan for urban development • Preparation of vision, strategy and action plan • Establishment of urban information system utilizing compiled data and information	■ Assistance for implementation to promote sustainable growth of Metropolitan Manila
	Improvement of Seismic Performance of Buildings	■ Assistance to create and promote the process for improvement of seismic performance of buildings ■ Retrofitting of a symbolic building(s) (Demonstration Project)	■ Monitoring and assistance for the Philippines to improve seismic performance of buildings
	Improvement of Seismic Performance of Infrastructure	■ Assistance to create and promote the process for improvement of seismic performance of infrastructure ■ Earthquake risk reduction of Dams ■ Study and research for integration of disaster risk reduction concept into development programs	■ Promotion for integration of disaster risk reduction concept into development programs ■ Earthquake risk reduction of dams nationwide
	Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas	■ Nationwide hazard and risk mapping	■ Monitoring of the following programs and activities • Encourage cooperation and coordination between local government and community • Increase disaster risk reduction capacity of local governments • Increase disaster risk reduction capacity of community
	Promotion of Research on Earthquake Disaster	■ Promotion of evaluation of earthquake risk (active faults) ■ Development of disaster management plan for Tsunami (Pilot project) ■ Study and implementation of earthquake disaster information transfer and dissemination system	■ Assistance for capacity building for earthquake research ■ Continuation of assistance for implementation of earthquake disaster information transfer and dissemination system

CHAPTER 11
RECOMMENDATION

In order to enhance the disaster mitigation capability of the Philippines, the following nine coordination programs (Draft) are recommended. The outlines of the programs are respectively shown in the tables from the next page:

Flood and Debris Disaster Sector

Target	Cooperation Programs (Draft)	Priority Issues in the Programs (Draft)
Reduction of Hazard (Structural measures)	Program for Enhancement of Construction, Operation and Maintenance of Flood Control and Sabo Structure	1.1 Formulation of Flood Control Plan for respective river basins (Flood Control Master Plan and Sabo Planning) 1.2 Review of Design Flood 1.3 Feasibility Study of selected project(s) 1.4 O & M of existing flood control and sabo infrastructure
Reduction of Vulnerability (Non-structural measures)	Program for Enhancement of Evacuation Systems	2.1 Establishment of FFWS 2.2 Preparation of Hazard Map 2.3 Construction of Database
Institutional Strengthening (Supporting measures)	Program for Institutional Strengthening for Flood Management	3.1 Review of laws and regulations 3.2 Organizational reform of DPWH (Reform of DPWH organization - 2nd Plan: Reform of PMO organization)) 3.3 Training of DPWH staff 3.4 Enhancement of Research and Development Capability 3.5 Accumulation of Knowledge and Establishment of Information Sharing System 3.6 Preparation of Technical Standards and Guidelines, etc.
	Program for Enhancement of Comprehensive and Integrated Countermeasures	4.1 Enhancement of Comprehensive Flood Control Plan (including strengthening of flood plain management) 4.2 Enhancement of Integrated Water Resources Management

Earthquake Disaster Sector

Target	Cooperation Programs (Draft)	Priority Issues in the Programs (Draft)
Enhancement of Disaster Risk Reduction Capacity of Metro Manila	Program for Enhancement of Disaster Risk Reduction Capacity of Metro Manila	1.1 High Level Advocacy Program 1.2 Promotion of Communication among National Government, LGU and Community 1.3 Enhancement of Disaster Risk Reduction Capacity of LGUs 1.4 Enhancement of Disaster Risk Reduction Capacity of Barangays (Communities) 1.5 Promotion of Earthquake Information Transfer and Dissemination System
Promotion of Earthquake Resistant Urban Development	Program for Promotion of Earthquake Resistant Urban Development	2.1 Promotion of Sustainable Growth of Metro Manila
Improvement of Seismic Performance of Buildings	Program for Improvement of Seismic Performance of Buildings	3.1 Improvement of Seismic Performance of Buildings 3.2 Retrofitting of a Symbolic Building (Demonstration Project)
Improvement of Seismic Performance of Infrastructure	Program for Improvement of Seismic Performance of Infrastructure	4.1 Improvement of Seismic Performance of Infrastructure 4.2 Risk Reduction of Dams 4.3 Evaluation of Earthquake Disaster Risk (Investigation of Active Faults) 4.4 Introduction of Risk Reduction Concept into Development Projects
Program for Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas	Program for Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas	5.1 Hazard and Risk Mapping of the Philippines 5.2 Evaluation of Earthquake Disaster Risk 2 (Preparation of Disaster Management Plan for Tsunami)

Table 11.1 Outline of Program (Draft) - Flood and Debris Flow Disaster Mitigation Sector (1/4)

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Flood and Debris Disaster Mitigation Sector	Development Issue	Reduction of Hazard (Structural Measures)
Program Name	Program for Enhancement of Construction, Operation and Maintenance of Flood Control and Sabo Structures		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	In the Philippines, typhoons attack the land nationally and cause damage to the extent of approximately 4,600 million Pesos every year. In order to reduce hazard magnitude due to natural disaster, construction, operation and maintenance of flood control and sabo structures are essential issue. However, because of non-existence of the Master Plan, as the result, DPWH is not able to implement flood control project based on the priority. In addition, since they want to implement a lot of flood control project in small and medium scale river basins under small budget, they are considering application of new design flood concept without inundation risk assessment and it will cause to inappropriate construction of structures. During implementation of new project, delay of construction is observed due to slow land acquisition, resettlement of persons residing in river area and removal of illegal settlers, etc., the original function of the facilities cannot be extracted. Under such situation, DPWH decided the basic strategy such as construction of database for river information, formulation of master plan and strengthening of O & M and cooperation and coordination with NGO in the new Medium-term Development Plan prepared in November 2004. Taking account the background abovementioned, this program will assist in formulation of appropriate master plan, clarification of priority of new flood control and sabo projects and accelerating establishment of facilities with appropriate design floods. In addition, as for existing structures, the program will assist in appropriate O & M. Further, concept of comprehensive flood control and integrated water resources management will be involved for master plan formulation.
Goal	Accelerating construction of flood control and sabo structures is realized.
Objectives	1. To clarify priority in the new flood control and sabo projects 2. To decide appropriate scale of flood control planning considering inundation risk 3. To improve technology of O & M for river structures and implementation is also improved and strengthened.
Expected Outputs	1. Database for principal rivers is constructed over the nation. 2. Flood control plan in the river basins where flood control and sabo structures shall be constructed with priority is formulated. 3. Appropriate scale of design flood for small and medium scale of rivers is determined. 4. Standard operation and maintenance manuals for post-project completion are prepared.
Major Activities	1. Assistance in database construction ・ Baseline data (socio-economic information, river information, disaster occurrence and its related information, land use conditions and development plans in inundation area, information of aid-projects, upper plan of disaster prevention, organization and operation of related agencies and LGU's disaster mitigation activities, etc.) ・ Database construction and maintenance, development of regular monitoring system (Since this will be baseline data of hazard map preparation, coordination with the Program for Enhancement of Evacuation Systems shall be considered.) 2. Assistance in flood control master plan and sabo planning ・ Development of criteria for selecting priority river basins (First and Second Screening) ・ Formulation of master plan and conduction feasibility study for selected river basins ・ Study for multi-sectoral approach of river basin development with the basis of flood control component ・ Assistance in selection of priority river basins/stretches for sabo planning and coordination in preparation of sabo planning integrated with flood control plan. 3. Assistance in review of design flood based on inundation risk assessment 4. Assistance in preparation of standard O & M manual (Application to pilot project will be also considered.)
Duration	5 years

Table 11.2 Outline of Program (Draft) - Flood and Debris Flow Disaster Mitigation Sector (2/4)

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Flood and Debris Disaster Mitigation Sector	Development Issue	Reduction of Vulnerabilities (Non-structural Measures)
Program Name	Program for Enhancement of Evacuation Systems		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	In the Government of the Philippines, of which budget constraint becomes serious, expects on inexpensive non-structural measures (soft measures) compared with structural measures are high in order to reduce flood and debris damage. The Flood Forecasting and Warning Systems have been installed from the 1970's with the assistance of the Japanese Government. The existing systems are PBAC Systems, Flood Forecasting and Warning Systems with Dam Operation, and EFCOS (Effective Flood Control Operation System). Since more than 20 to 30 years have passed after installation for all systems and the quality of apparatus has seriously deteriorated, renewal or rehabilitation of the facilities is required. On the other hand, the FFWS is limited to certain regions and does not have nation wide coverage. In order to achieve safe operation of the existing river structures and ensure sound evacuation, a FFWS is a prerequisite as a bridge between structural and non-structural measures. However, taking account of the present national economic conditions of the Philippines, instead of a new expensive and sophisticated system, a simple FFWS system shall be introduced. To realize this objective, formulation of a nation-wide master plan of FFWS is required. Further, DWPH has no database system at present and is collecting required data/information through individual projects independently. These data are absolutely required for planning of flood control and sabo projects, operation and maintenance of river structures and response in an emergency. Based on the data base, a hazard map will be prepared and be reflected in evacuation plans, which will lead to strengthening of evacuation systems. Further, sustainable formulation of database system will be available by regular updating of the data.
Goal	To contribute reduction of vulnerability with strengthening of evacuation systems
Objectives	1. To accelerate improvement and restoration of existing FFWS and contribute to reduce flood and debris damage. 2. To clarify basic policy of dissemination of FFWS over the nation. 3. To strengthen evacuation system by means of integration of utilization of FFWS and hazard maps in evacuation plan
Expected Outputs	1. Existing FFWS is improved and function as planned and as designed is restored. 2. River basins (or regions) for promoting installation of FFWS are selected in national level and the master plan is formulated. 3. Simple FFWSs with new concept are studied and contents of evacuation plan is improved. 4. Database related to flood control and sabo engineering in nation-wide is constructed. Hazard maps are prepared by means of this database system.
Major Activities	1. Improvement of existing FFWS, O & M technology and organization 2. Nation-wide FFWS master plan is formulated. Through the study, comparison between conceivable systems is conducted and an appropriate plan is contemplated. 3. Implementation plan for the selected/formulated FFWS in the Master Plan is prepared. 4. Collection of topographic data, demographic data, disaster mitigation data, evacuation data, resettlement information, structure information (maintenance), risk information of structures, information about facilities operated by related agencies and hazard map information is conducted. 5. Construction of database of the collected data (by means of new information technology and GIS, etc.) 6. Preparation of hazard maps and development of technical tools based on the database 7. Assistance to preparation of community based hazard maps.
Duration	5 years

Table 11.3 Outline of Program (Draft) - Flood and Debris Flow Disaster Mitigation Sector (3/4)

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Flood and Debris Disaster Mitigation Sector	Development Issue	Institutional Strengthening (Supporting Measures)
Program Name	Program for Institutional Strengthening for Flood Management		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	There is no sole responsible agency taking charge of water resources administration in the Philippines. Many agencies are working out their responsibilities under their own missions for water related development work. Although the Water Code is the principal law, there is little stipulation regarding flood control and sabo engineering. In concrete, river administrator is not clearly defined. River basins are classified merely based on the scale of catchment area and its management is unclear. Further, definition of floodway and river structures is unclear. As the results, organization of river management is not sufficient. And not only river management during flood and but also management during low flow, which is important for creating sound river environment, is not conducted sufficiently. Further, as for firm implementation of plans, organizational strengthening of DPWH is urgent issue. Taking account of current situation, strengthening of PMO-MFCP and positioning of FCSEC and clarification of its future direction is particularly essential. FCSEC is conducting training and education of DPWH staff supported by Japanese experts at present. This program is principally aiming at training of DPWH staff in flood control and the sabo engineering sector. This program will be terminated in June 2005 (extension of the project is under consideration). The performance of FCSEC seems so active and progressive. The outcomes to date are: 1) Preparation and distribution of a Techhnical Mannual, 2) OJT/Off-JT, 3) Damage status survey, and 4) Preparation and distribution of Operation and Maintenance Manual. Further, human development is required, such as OJT through projects, training of Project Managers (PM), continuation of R & D, etc. As for continuation of the current program, clarification of FCSEC's position and involvement in providing a planning service is required. The outcome of the program is expected to disseminate to regions and cities in the future. Assistance in academia such as setting-up of disaster management course, etc in universities is also considered.
Goal	To contribute to reduction of damage by means of institutional strengthening
Objectives	1. To prepare the Water Code and its implementation rules 2. To realize strengthening of DPWH organization (increasing number of staff, planning function, etc.) 3. To become to be able to formulate self-reliant and sustainable flood control plan and river management 4. To promote accumulation of knowledge and information sharing 5. To prepare technical standard and guideline and to utilize them effectively
Expected Outputs	1. The river administrator is appointed and the river basins managed by the central and regional governments are clarified. 2. The extent of river area and regulations of river structures are clarified. 3. PMO-MFCP is strengthened (increasing staff and organizational reform to change to permanent one, etc.) 4. Training for DPWH staff is improved through on-the-job in projects and technical capability is improved. Project managers are trained through project implementation. 5. Planning of appropriate river structures by DPWH staff is enabled. 6. As for management of river basin in the regions, staffs of DWPH Regional and District Offices are trained.
Major Activities	1. To understand the present River Law and recognition of its status 2. To review the present conditions of utilization of rivers (principal river basins and small and medium river basins) 3. To review the bylaws of the River Law 4. To grasp of the present status and problems of all DPWH and PMOs for flood control 5. To grasp the present status of FCSEC and to clarify the employment status of FCSEC staff 6. To clarify the position of FCSEC in DPWH (integration of planning function, implementation and supervision of pilot project) 7. To consolidate consensus between related governmental agencies on the bylaws of the water Code and to secure public involvement and issuance of the bylaws and integration in the Water Code 8. To conduct educational programs, introduction of progress and information sharing (management of project outcome, newsletters and websites, etc.) 9. To conduct research and development (especially hydraulic model tests) 10. To set-up disaster management and flood management courses (river engineering, hydraulics and hydrology, etc.) in major universities
Duration	5 years

Table 11.4 Outline of Program (Draft) - Flood and Debris Flow Disaster Mitigation Sector (4/4)

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Flood and Debris Disaster Mitigation Sector	Development Issue	Institutional Strengthening (Supporting Measures)
Program Name	Program for Enhancement of Comprehensive and Integrated Countermeasures		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	In the Philippines, there is still no experience, in which structural and non-structural measures are jointly introduced and combined with land use plan from planning stage. Under the further budget constraint in the future, reduction of flood and debris flow damage shall be efficiently reduced with limited budget and the comprehensive flood control measures are expected to realize. On the other hand, regarding the water resources management in the river basin, there are various water-borne problems such as sound operation of relevant facilities during floods, stable water supply and water quality conservation, revival of deteriorated river environment in urban area (restoration of environmentally sound system of hydrological cycle), etc. in the Philippines. For instance, unexpected floods occurred at downstream areas due to inappropriate spill-out from dam during foods in December 2004 and establishment of sound operation rules of multipurpose dam reservoir near Metro Manila, etc. are recently noted as important issues. This security of water (2nd World Water Forum in Hague, Netherlands, 2000) and sustainable water resources management becomes an international trend as global issue in Japan as well. Introduction of integrated water resources management shall be realized and strengthened as one of effective measures to solve complicated water problems. In Japan, some development plans have been contemplated based on such concept and some of those were already implemented (Kanda River in Tokyo, Tsurumi River in Kanagawa, etc.). It is expected that the knowledge and experiences can be utilized in the technical and administrative aspects.
Goal	To improve water resources environment (quantity, quality and environmental aspects) and to contribute to reduction of damage by means of institutional strengthening
Objectives	1. Priority river basins for comprehensive flood control and integrated water resources management are identified. 2. Technical standards and guidelines that meet actual conditions in the Philippines are prepared. 3. Project with comprehensive flood control and integrated water resources management are implemented.
Expected Outputs	<u>Comprehensive Flood Control Measures</u> 1. Disordered development will be restricted by means of integration of disaster and flood management aspects in formulation of land use plan. 2. Existing flood protection and sabo engineering infrastructure are effectively utilized and contribute to reduction of flood and debris flow damage. 3. Coordination between related agencies by means of realizing measures crossing over the organizations is improved and strengthened. 4. Local disaster management activities with spontaneous and active cooperation and coordination among government and citizens are enhanced. <u>Integrated Water Resources Management</u> 1. Stable water supply is strengthened by effective use of existing water resources related facilities (such as dam and reservoir, etc.) 2. River environment and system of hydrological cycle in urban areas are improved and restored. 3. Sustainable water management by the unit of river basin is realized.

Major Activities	1. Preparation of guideline and technical standard to urge the comprehensive flood control measures and the integrated water resources management 2. Assistance of technical and institutional aspect for NWRB and NFMC (Assistance of legal framework and policy decision) 3. Setting of high priority model river basins and areas 4. Assistance of evolving outcome indicator and examination of related measures and projects 5. To promote assistance for establishment of executing organization (e.g. establishment of framework to involve various organizations who are LGU, NGO, residents associations and so on.) (Including possibility study of River basin authority = river system consistent principle) 6. To advance utilization of guideline and technical standard through the pilot project 7. Assistance activity to comprehensive flood control measure and integrated water resources management by universities and research institutions 8. Assistance for set up courses, delivering lectures, issuing periodicals, etc. of comprehensive flood control measures and integrated water resources management in universities
Duration	5 years

Note: As for implementing this program, monitoring of effects of cooperation shall be incorporated considering collaboration with other three programs (ex. regular follow-up of activities and evaluation of cooperation, etc).

Table 11.5 Outline of Program (Draft) - Earthquake Disaster Mitigation Sector (1/5)

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Earthquake Disaster Mitigation Sector	Development Issue	Enhancement of Disaster Risk Reduction Capacity of Metro Manila
Program Name	Program for Enhancement of Disaster Risk Reduction Capacity of Metro Manila		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	In the Philippines, disaster management is one of the top priority areas for sustainable development, as both natural and social conditions are vulnerable due to recurrent disasters. Especially, earthquake risk reduction of Metropolitan Manila is one of the most important issues as Metro Manila is the political, administrative, economic, educational, cultural and information center of the Philippines. In the Philippines, on the other hand, a vertical command system exists linking central government, provincial government, city and municipal government, and barangay (community). However, due mainly to 1) a weak institutional structure and 2) lack of resources (human, technique, knowledge, experience, funds), even the disaster management planning, which is defined in the Presidential Decree as the basic component for disaster management, has not been practically implemented at all levels. To raise awareness from the central government to community about earthquake disaster, enhancing disaster risk reduction capacities of all levels and strengthening cooperation networks effectively both vertically and horizontally among them are essential. Moreover, an information transfer and dissemination system that enables surveyed and monitored earthquake information to be distributed simultaneously and accurately to central governments, local governments, disaster management agencies, and mass media, which eventually transmits to the general public, shall be systematically utilized as a basic tool for disaster management activities.
Goal	Enhancement of disaster risk reduction capacity of Metro Manila
Objectives	1. Raise awareness for disaster risk reduction 2. Encourage cooperation and coordination between local government and community 3. Increase disaster risk reduction capacity of local governments 4. Increase disaster risk reduction capacity of communities 5. Promote earthquake disaster information transfer and dissemination system
Expected Outputs	Raised political will and awareness about disaster management among politicians and public administrators leads to upgraded disaster management policies, legal framework, institutional arrangements, and budget allocations. An institutionalized standard process for strengthening disaster management capacities for local governments and communities has become a template for other areas in the Philippines to encourage similar activities. Strategy and action plans to expand the activities to the national scale will be prepared. Information transfer and dissemination systems for related organizations and citizens will be studied and implemented.
Main Activities	1. Assistance for planning and implementation of awareness raising programs for politicians, public administrators, communities and private sector 2. Assistance for planning and implementation of programs encouraging cooperation and coordination among central and local governments, and community 3. Assistance for planning of disaster risk reduction programs, preparation of tools and their implementation 4. Assistance for training of NGOs and local consultants 5. Assistance for strategy setting and implementation planning for expanding disaster risk reduction activities to other cities and communities in Metro Manila as well as throughout the nation 6. Assistance for study for an earthquake disaster information transfer and dissemination system in the Philippines 7. Assistance for implementation of an earthquake disaster information transfer and dissemination system
Duration	5 years

Table 11.6 Outline of Program（Draft) - Earthquake Disaster Mitigation Sector（2/5）

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Earthquake Disaster Mitigation Sector	Development Issue	Promotion of Earthquake Resistant Urban Development
Program Name	Program for Promotion of Earthquake Resistant Urban Development		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	Metropolitan Manila is extremely unfortified and vulnerable to earthquake disasters. Metropolitan Manila has been in a critical situation having various urban problems including flooding. Degradation of urban functions such as economic infrastructure (traffic, sewerage, drinking water, energy, communication system), and life and environmental infrastructure (waste disposal, education, medical) has hindered urban growth and aggravated the living environment of urban dwellers. Rapid population growth may also accelerate the degradation and causes serious problems for disaster risk reduction, social stability, the environment and the economy, and unexpected urban problems that will result in hindering sustainable development and poverty alleviation. With such a background, earthquake disaster risk reduction needs to be taken as a part of approaches for securing urban safety, environmental conservation, upgrading public services for citizens, and maintenance of urban economic activities. Assistance is urgently required to support the following activities by the administrations, citizens, the economic circle, and academia of the Philippines: 1) selection of the future direction for Metropolitan Manila, 2) preparation of future visions, effective strategies and action plans, and 3) preparation of implementation plans that includes monitoring functions.
Goal	Promote sustainable growth of Mega Manila, including Metropolitan Manila as its core
Objectives	Assist activities of local initiatives for sustainable development, urban poverty alleviation, environmental protection and recovery in Mega Manila including Metropolitan Manila.
Expected Outputs	Agreement and ownership for selection of the future of Mega Manila will be formed among related organizations or groups in the Philippines through preparation of future scenarios, and visions, strategy, action plans and their implementation plans for the sustainable growth of Metropolitan Manila and neighboring area.
Main Activities	1. Assistance for the study of current situation, and selection and evaluation of issues related to sustainable growth of Mega Manila, such as geography, environment, social issues, disasters, infrastructure, economy, finance, public administration, and development plans 2. Assistance for establishment of urban information system 3. Assistance for activities of the Philippines ・ Preparation of future scenarios for Mega Manila ・ Preparation of urban development scenario ・ Preparation of vision for sustainable growth of Mega Manila ・ Preparation of strategy and action plans for sustainable growth of Mega Manila ・ Preparation of implementation plans for actions
Duration	5 years

Table 11.7 Outline of Program (Draft) - Earthquake Disaster Mitigation Sector (3/5)

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Earthquake Disaster Mitigation Sector	Development Issue	Improvement of Seismic Performance of Buildings
Program Name	Program for Improvement of Seismic Performance of Buildings		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	Human damage caused by earthquake disasters is attributed to collapse of residential buildings, commercial buildings and public buildings, and also to fire. It was estimated that in Metropolitan Manila 170,000 buildings would be collapsed and cause death toll of 34,000. Area of 1,710 ha would be burnt down and this would add death of 18,000. It is also estimated that 8 to 10% of public facilities, for example, hospitals, schools, fire stations, police stations, would be collapsed, 20-25% of these buildings would be partly damaged. To improve earthquake resistance of the buildings, various issues need to be solved by local initiatives with participation by public administration, universities, academia, and business circles. In particular, active initiatives by the Philippine Institute of Civil Engineers (PICE) and the Association of Structural Engineers of the Philippines (ASEP) are expected to play a significant role. Retrofitting of vulnerable buildings is important. However, under current conditions the initiative of the private sector is essential. Stimulating demands of economic circles and individuals through activities by the academic circle such as PICE and ASEP, consultants, and engineering and construction industries is required. Retrofitting of a symbolic building(s) in the Philippines, for instance the Presidential building(s) would be effective to raise public attention to retrofitting of buildings.
Goal	Improve seismic performance of buildings
Objectives	Develop processes for improving seismic performance of buildings.
Expected Outputs	Processes to improve seismic performance of buildings by local initiatives are established, which enable the Philippines to tackle the long-term approach for the goal. Retrofitting of the symbolic building is carried out, as a demonstration project, to assist and encourage this long-term approach.
Main Activities	1. Assistance for activities by public administration, universities, academia and business circles of the Philippines to improve seismic performance of buildings. ・ The activities include consensus building, needs assessment, target setting, establishment and operation of deliberating committees, technical working groups, holding workshops and seminars for information dissemination, planning of implementation. ・ Issues to be tackled will be selected by local initiatives from the likes of seismic design codes, the approval and authorization system, inspection systems, capacity building for design and construction management, maintenance and management, quality control of building materials, technology of retrofitting, general education, expertise education, and research and development. 2. Assistance for planning of the retrofitting of the symbolic building of the Philippines, and for conducting a feasibility study.
Duration	5 years

Table 11.8 Outline of Program (Draft) - Earthquake Disaster Mitigation Sector (4/5)

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Earthquake Disaster Mitigation Sector	Development Issue	Improvement of Seismic Performance of Infrastructure
Program Name	Program for Improvement of Seismic Performance of Infrastructure		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	Damages to infrastructures of Metropolitan Manila, such as roads, bridges, airports and seaports, would hamper rescue and relief activities. And damages to lifelines, such as water distribution system, would increase the secondary damages. To improve seismic performance of infrastructure is an issue to be tackled for the long term. As with buildings, joint efforts by public administrators, universities, academia and business circles are required to improve or re-develop design codes and to promote retrofitting of infrastructure. In the case of Angat dam and others, which provides 97% of the water demands of Metro Manila, being damaged by an earthquake, it would result in ceasing water supply to Metro Manila. This would have further impact on people, socio-economic activities, urban sanitation and the urban environment, which had already suffered from the earthquake disaster. This would also affect enormously any search and rescue activities, and recovery and reconstruction activities, which would eventually lead to a long-term effect on the entire nation. It is necessary to study impact and risk of the dams to Metro Manila and to prepare risk reduction measures. It is also necessary to study how to integrate the disaster risk reduction concept into development projects, by using the study of the economic impact on Metro Manila triggered by damage to the dams.
Goal	Improve seismic performance of infrastructure
Objectives	Develop processes for improving seismic performance of infrastructure
Expected Outputs	Processes to improve seismic performance of infrastructure by local initiatives are established, which enable the Philippines to tackle the long-term approach for the goal. Risks of the dams are evaluated and their reduction measures are prepared. Integration of the disaster risk reduction concept into development projects is promoted.
Main Activities	1. Assistance for activities by public administration, universities, academia and business circles of the Philippines to improve seismic design codes and retrofit infrastructure. The activities include consensus building, needs assessment, target setting, establishing and operating deliberating committees and technical working groups, and holding workshops and seminars for information dissemination. 2. Assistance for activities to reduce the earthquake disaster risk caused by the dams. 3. Assistance for study active faults that would cause earthquake impacts both on Metro Manila and the dams. 4. Assistance for study or research for integration of the disaster risk reduction concept into development projects by using the study on Metro Manila and the dams
Duration	5 years

Table 11.9 Outline of Program (Draft) - Earthquake Disaster Mitigation Sector (5/5)

I Basic Information

Country Name	Philippines		
Focused Area of Cooperation	Earthquake Disaster Mitigation Sector	Development Issue	Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas
Program Name	Program for Enhancement of Disaster Risk Reduction Capacity of Provincial Cities and Rural Areas		

II Outline

Outline of Focused Area and Cooperation Issue (Background of Cooperation)	Metropolitan Manila was selected as the top priority area for earthquake disaster risk reduction activities, while earthquake disaster recurrently affects many areas in the whole nation. Resources (human, technology, knowledge, information, experience), which are gained through activities in Metropolitan Manila, should be utilized to improve and enhance disaster risk reduction capacity of provincial cities and rural areas, especially for Barangay and community residents, of the Philippines. As is demonstrated in the Earthquake Impact Reduction Study in Metropolitan Manila (JICA, 2004), hazard and risk mapping was the first step to build up the disaster risk reduction capacity by comprehending earthquake disaster damages, urban vulnerability and coping capacity to the disasters. To enhance earthquake disaster risk reduction capacities in other areas of the Philippines, macro-scale hazard and risk mapping should also be the first step. This mapping will enable identification of more vulnerable areas or cities, and priority issues to tackle. Various agencies of the Philippines have prepared hazard maps or have plans to do so. For the maximum utilization of resources of the Philippines, it is recommended that the hazard and risk maps should include not only earthquake and tsunami but also information of other disasters, social, economic and environmental issues. Tsunami is also causing periodical damage to the Philippines. In the above mentioned study, no detailed study has been conducted, except relating to warning for tsunami caused by the Manila Trench. A pilot study for producing a disaster management plan for tsunami is required.
Goal	Enhance disaster risk reduction capacity of provincial cities and rural areas in the Philippines
Objectives	1. Prepare nation wide hazard and risk mapping 2. Prepare disaster management plan for Tsunami
Expected Outputs	Hazard and risk maps of natural disasters nationwide are prepared to assist strategic planning, and selection of priority locations and priority issues. By unifying the hazard and risk mapping, the maximum usage of the resources, and effective and wider utilization of the maps are promoted. A model study for a disaster management plan for Tsunami is formulated, which is applicable to the other areas of the Philippines.
Main Activities	1. Assistance for preparation of nation-wide macro-scale hazard and risk maps. The maps will contain the following information: natural conditions, socio-economic information, environmental information, and natural disaster information including earthquakes. 2. Assistance for preparation of the disaster management plan for Tsunami in a pilot area that is selected by utilizing the hazard and risk maps. 3. Assistance for compilation of outputs and lessons from other programs (enhancement of disaster risk reduction capacity of Metro Manila, improvement of seismic performance of buildings, and improvement of seismic performance of infrastructure), and study for application of the results to the rural areas. 4. Assistance for preparation of strategy and action plans for pursuing capacity building for earthquake disaster risk reduction of provincial cities and rural areas.
Duration	5 years