AUDMP Project Report #4

Asian Urban Disaster Mitigation Program

Project Completion Report of the

Indonesian Urban Disaster Mitigation Project

September 2000

Implemented by

Institute of Technology Bandung

adpc
Asian Disaster Preparedness Center
Bangkok, Thailand www.adpc.ait.ac.th

The **Indonesian Urban Disaster Mitigation Project** was launched in March 1997 under the Asian Urban Disaster Mitigation Program. The objective of the Indonesia national demonstration project is to reduce the vulnerability of the urban population, infrastructure, critical facilities, and shelter in Bandung, West Java to natural disasters, particularly to earthquake hazards. The project, implemented by the Center for Earthquake Engineering Studies (CEES) and Center for Urban and Regional Development Studies (CURDS) within the Institute for Research, Institut Teknologi Bandung (ITB), demonstrated a methodology for seismic risk analysis, mitigation and preparedness. The project assisted municipal officials to develop improved tools and skills in urban planning, improved building regulation, and emergency preparedness. Activities under the demonstration phase of the project included hazard and vulnerability mapping, city spatial plan review, building control monitoring system review, capacity building of local disaster management unit, development of city operational emergency plan, review of the existing national policy on disaster management and mitigation, and networking.

This paper is published under the Asian Urban Disaster Mitigation Program for sharing knowledge and experiences from national demonstration projects on disaster mitigation in target countries of Asia. It is made available by the Asian Disaster Preparedness Center, Bangkok, Thailand, with minimal editing. The opinions expressed herein are those of the author and do not necessarily reflect the views of Asian Disaster Preparedness Center or the U.S. Agency for International Development. Publication of this paper was made possible through support provided by the Office of Foreign Disaster Assistance, United States Agency for International Development, under the terms of Cooperative Agreement No. 386-A-00-00-00068.

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Acknowledgements

It is with pleasure that ADPC presents the project completion report of the Indonesian Urban Disaster Mitigation Project (IUDMP). The IUDMP is one of the national demonstration projects under the Asian Urban Disaster Mitigation Program (AUDMP). The AUDMP, which is currently being implemented in Bangladesh, Cambodia, Laos, India, Indonesia, Nepal, Philippines, Sri Lanka, and Thailand, has demonstrated successful methodologies and approaches in mitigating the impact of the natural disasters in the region. During implementation of the national demonstration projects by country partners, there has been continuous building of knowledge and experience emanating from the country projects. The national demonstration projects have produced wealth of knowledge in the form of hazard maps, reports, proceedings, review of policies, documentation of various events and activities, etc.

The purpose of making this report available is to share the knowledge and experiences with those attempting to develop similar procedures for urban disaster management in their respective cities.

The IUDMP is implemented by the Center for Earthquake Engineering Studies and Center for Urban and Regional Development Studies within the Institute for Research, Institut Teknologi Bandung. The project has demonstrated a methodology for seismic risk analysis, mitigation and preparedness. The project assisted municipal officials to develop improved tools and skills in urban planning, improved building regulations, and emergency preparedness. Major activities under the demonstration phase of the project included hazard and vulnerability mapping, city spatial plan review, building control monitoring system review, capacity building of local disaster management unit, development of city emergency operation plan, review of the existing national policy on disaster management and mitigation, and networking.

ADPC congratulates ITB and the IUDMP project team for successfully implementing the demonstration project activities. ADPC appreciates the efforts made by the project in promoting earthquake risk reduction policies and replicating the activities to other earthquake prone areas, such as Bengkulu. The initiatives taken by the IUDMP for reducing the loss of lives and damage of properties from devastating earthquake disasters are of great value to those involved in similar efforts elsewhere in the region.

We hope that you will find this report useful and we look forward to receiving your comments.

Dr. Suvit Yodmani
Executive Director
Asian Disaster Preparedness Center
Bangkok, Thailand

September 2000

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ASIAN URBAN DISASTER MITIGATION PROGRAM - AUDMP

INDONESIAN URBAN DISASTER MITIGATION PROJECT

"Earthquake Hazard Mitigation in the Municipality of Bandung"

FINAL REPORT

Period Covered: March 1997 – July 2000

1.0 Background

The geodynamic position of Indonesia, as the place of interaction between three plates, i.e. the Australian plate, Eurasian plate and the Pacific plate, is such that Indonesia is one of the most seismically active countries in the world. Many major earthquakes in the past have damaged several cities and rural settings, causing major losses of life and properties. In the past, the government and the community considered that emergency response and reconstruction of infrastructures during earthquake disaster events as the most important disaster management activities, which indicates the reactive nature of the coping mechanism. Earthquake hazard mitigation, although theoretically far more economic and is based on a more proactive approach, is seldom considered as priority by the government, in the national level as well as in the local level.

The City of Bandung, the capital city of West Java Province, despite its position in the seismic source zones system of the region, has never experienced damaging earthquake in its past. Nevertheless, the city has an augmented risk toward earthquake disaster, due to the following factors:

- major faults system of West Java (Sunda Strait Fault in the west, Indian Ocean Subduction Fault in the south, Baribis Fault and Cimandiri Fault in the middle, Bumiayu Fault in the east, and some other smaller faults),
- soil condition due its location in the prehistoric lakebed of Bandung Basin,
- population density and growth
- strategic context of the city
- lack of preparedness

From the point of view of activity, Bandung is a multi-function city, i.e. there are major activities related to government administration, education facilities, industrial and tourism development as well as tertiary services. Bandung is the third largest Indonesian City after Jakarta and Surabaya with the population of 2,4 million, spread over an area of 167.29 km^2. The city holds many important roles in the economy and development of the nation. Many Indonesian central government agencies and prestigious national education institutions are situated in Bandung, such as ITB as the oldest engineering education institution in Indonesia. The headquarters of the National Telecommunication Company, the

National Post Company and the National Railways Company are all located in Bandung. Some strategic industries such as the national telecommunication and electronic manufacture plant, the national aircraft industry and the national arm industry and many others are also located in the city. Small industries are developing intensely in the household activities, making Bandung a unique industrial city. About 70% of Indonesian textile industries are located in West Java, two thirds amongst them are situated in Bandung.

The city is located in a highland plateau, surrounded by mountains and active volcanoes. Mt. Burangrang and Mt. Tangkuban Prahu in the north, Mt. Galunggung, Mt. Guntur and Mt. Papandayan in the east and Mt. Patuha in its south. Situated in the upper stream of Citarum River Basin, the southern part is a flat flood plain area formed by the confluent of 23 rivers into the Citarum River, prone to annual flooding.

Seismically, Bandung is located in Zone IV of the new seismic hazard map (Zone I is not seismic – Zone VI is the highest in seismicity). The Lembang fault, although considered as not active, can visibly be seen just north of the city. Several strong tremors can be felt every year, none of them have caused major damage.

The vulnerability of the city is worsened by the fact that because of lack of understanding and also inadequate control and supervision during the planning and implementation of urban development, many public infrastructure as well as private buildings were constructed without respect to earthquake mitigation practice and code. The modern sector buildings are developed side by side with traditional sector without any specific pattern and concept. Squatters' area can be found in dense areas in the center of the city, along the river. Mixed used activities and functions are common in land use planning in Bandung. Infrastructure and lifelines are prone to be cut out of service during strong earthquake. Critical facilities such as hospitals, health centers and public schools buildings are often built with limited budget and less attention toward construction quality. Construction due to urbanization expands uncontrollably into highly sloped adjacent areas which are prone to landslides.

Despite the risk, there has not been any organized approach to mitigate earthquake disaster by the community. The city does not have any comprehensive disaster mitigation and management plan or urban environmental plan, which might save the life of a large number of its population during an unexpected disaster incident. The City Spatial Planning Document (1993-2003) has never taken into account the earthquake risk faced by the City and no provisions were requisitioned toward mitigating this risk. The local disaster management board is practically ineffective, as it has never been committed to the emergency plan set out by the Mayor's decree in 1998. Awareness toward earthquake risk among the people and the local government officials are basically low. Earthquake disaster is not a priority in the city, which faces annual flooding

and urban fires chronically.

To improve the city awareness toward earthquake risk, an initiative in disaster mitigation program has been implemented in Bandung City as a demonstration project under the Asian Urban Disaster Mitigation Program coordinated by the Asian Disaster Preparedness Center (ADPC). The project is called the Indonesian Urban Disaster Mitigation Project (IUDMP), which is basically aimed at establishing sustainable public and private sector mechanism for disaster mitigation in Indonesian cities, taking Bandung as its pilot study area. The Institute for Research from Institute of Technology Bandung carried out the project management. The project implementation has involved many participants from various organizations under the local government as well as the national level institutions. It was carried out collaboratively by the Earthquake Engineering Research Group (EERG) and the Center for Urban and Regional Planning Study (CURDS) within the Institute for Research of Institute of Technology Bandung (LP-ITB), with the participation of various relevant agencies and individuals advocates to disaster mitigation in the region.

The Institute for Research of ITB (LP-ITB) as the lead institution of the project has an extensive experience in conducting and implementing various scientific, applied and industrial researches, funded by various grants and government or industrial contracts. It has extensive computing facilities with the capability of GIS mapping, networking and supported with a number of earthquake analysis software. The role of the LP-ITB is primarily to organize an inter and multidisciplinary research conducted in the faculties and in research centers devoted to research on science, technology and visual arts. The research centers are multidisciplinary, and many are engaged in interdisciplinary research. More specifically, CURDS has many experiences with various studies and works with local government on spatial planning, urban issues and public policies. The EERG has conducted researches on earthquake hazard and mitigation and previously have worked under government contract for earthquake mitigation study in Flores. It is also active in monitoring earthquake damage of several major important earthquakes in a number of regions in Indonesia.

The development and implementation of IUDMP projects definitely depends upon reliable collaboration and networking among key decision-makers, concerned agencies, the institutions and community of Bandung. The process of developing and implementing the project is an important vehicle for building collaboration and networking, which integrate the participation of government, and non-government organizations that join the project team and the project working-group.

A disaster mitigation program for the city is inevitable. The process of identifying hazards and risks, developing mitigation strategy, action plan, preparing guidelines and disaster awareness campaign for Bandung city is expected to improve the appreciation of the related agencies to disaster mitigation activities. It will also be beneficial for local community preparedness on any eventual disaster

in the future, in particular earthquake.

2.0 Project Description

The Indonesian Urban Disaster Mitigation Project: Earthquake Hazard Mitigation in the Municipality of Bandung is established within the framework of the Asian Urban Disaster Mitigation Program (AUDMP) initiated by the Asian Disaster Preparedness Center Foundation (ADPC), Bangkok – Thailand and funded by a grant from USAID OFDA. The IUDMP, which took the City of Bandung as its case city, is formulated by the Earthquake Engineering Research Group (EERG) and the Center for Urban and Regional Development Studies (CURDS) of the Institute for Research, Institute of Technology Bandung, with the active participation from various relevant agencies and individuals advocate to disaster mitigation in the region.

The IUDMP is run under the Grant Agreement No. AUDMP-INDO-DP-1-97, under the USAID Cooperative Agreement No. 940-1008-A-00-5531-00, effective project date from 1 March 1997 to 31 August 1998.

The Grant Amendment No. 1 extended the Grant Agreement No. AUDMP-INDO-DP-1-97 under the USAID Cooperative Agreement No. 940-1008-A-00-5531-00 for the Indonesian Urban Disaster Mitigation Project: Earthquake Hazard Mitigation in the Municipality of Bandung for the implementation of Phase I of IUDMP. The effective date under this Grant Amendment is 31 August 1998 and the completion date is 31 August 1999.

The Grant Amendment No. 2 to the Grant Agreement No. AUDMP-INDO-DP-1-97 under the USAID Cooperative Agreement No. 940-1008-A-00-5531-00 for the Indonesian Urban Disaster Mitigation Project: Earthquake Hazard Mitigation in the Municipality of Bandung approved the implementation of the Phase II proposal.

The Grant Amendment No. 3 to the Grant Agreement No. AUDMP-INDO-DP-1-97 under the USAID Cooperative Agreement No. 940-1008-A-00-5531-00 for the Indonesian Urban Disaster Mitigation Project: Earthquake Hazard Mitigation in the Municipality of Bandung extended the implementation of Phase II until 31 December 1999.

The Grant Amendment No. 4 to the Grant Agreement No. AUDMP-INDO-DP-1-97 under the USAID Cooperative Agreement No. 940-1008-A-00-5531-00 for the Indonesian Urban Disaster Mitigation Project: Earthquake Hazard Mitigation in the Municipality of Bandung extended again the IUDMP Phase II until 31 March 2000.

The Grant Amendment No. 5 to the Grant Agreement No. AUDMP-INDO-DP-1-

97 under the USAID Cooperative Agreement No. 940-1008-A-00-5531-00 for the Indonesian Urban Disaster Mitigation Project: Earthquake Hazard Mitigation in the Municipality of Bandung extended for the last time the implementation of the IUDMP Phase II until 31 May 2000.

3.0 OBJECTIVE OF THE PROJECT

The goal of the IUDMP is to reduce the earthquake vulnerability of the urban population, infrastructure, critical facilities, and shelter in the Indonesian cities.

The objective of the IUDMP is the establishment of sustainable public and private sector mechanisms for disaster mitigation in targeted urban areas of Indonesia, with the City of Bandung, West Java, as the case study for the demonstration project. The objective of Phase II is to implement a sequence of actions identified in the Phase I, destined to reduce the vulnerability of the city.

4.0 PROJECT PARTNER AGENCIES

The organizations involved in the IUDMP consist of government and non-government organizations:

National Level Government Organizations

- **BAPPENAS (Badan Perencanaan Pembangunan Nasional): National Development Planning Agency**

  BAPPENAS is the national agency responsible for national development planning. In this project, BAPPENAS was supposed to be the counterpart agency in the preparation of policy input for the national urban disaster mitigation strategy. Due to the recent changes in economic and political situation, BAPPENAS has had to response to economic emergency situation as well as to impacts caused by civil strife in various places of the country. This has caused that BAPPENAS could not be able to put priority on much longer terms urban disaster mitigation strategy. The contact person in BAPPENAS is Ms Esther Dwinita, who also participated in the UDM-1 course.

- **BAKORNAS PB (Badan Koordinasi Nasional Penanggulangan Bencana): National Disaster Management Coordinating Board**

  National Disaster Management Coordinating Board is a non-structural, non-permanent organization, coordinating its members, which consist of various government institutions, NGO's and community organizations, in disaster management efforts. At the provincial and local government level, similar

structure is replicated. As a coordinating body, BAKORNAS PB roles and responsibility include formulating policies in disaster management, producing guidelines and direction and coordinating both before-, during-, and post-disaster activities, in terms of preventive, repressive and rehabilitative actions, which cover the whole disaster management cycle, i.e. prevention, mitigation, emergency response, rehabilitation and reconstruction.
The contact persons from BAKORNAS PB for this project is Drs. Soetarso (later retired) and DR. Adang Setiana.

- **BADIKLAT DEPDAGRI (Badan Pendidikan dan Latihan Departemen Dalam Negeri): Education and Training Agency, Ministry of Home Affaires**

  Education and Training Agency, Ministry of Home Affairs responsibilities include:

  - Coordinates HRD program (education and training) within the Ministry of Home Affaires, Provincial and local governments.
  - Implements strategic training programs for officials and employees of the Ministry of Home Affaires, Provincial and local government.
  - Supervises 4 regional training agencies and 26 provincial training agencies.

  The BADIKLAT DEPDAGRI is one of the selected NPTI (National Partner for Training Institutionalization) for developing and implementing national UDM course in the country. Contact person is Mr. Marhaban Ibrahim.

- **Pusat Penelitian dan Pengembangan Geologi: Geological Research and Development Center (GRDC), Department of Mining and Energy**

  The Geological Research and Development Center (GRDC), Pusat Penelitian dan Pengembangan Geologi (Puslitbang Geologi), is one of the center for research and development under the Department of Mining and Energy. GRDC supported data and expertise for the project on the geological condition of the city as well as on seismic historic data. It also provided analysis on liquefaction and landslides potential. The GRDC expert involved in this project is Ir. Engkon K. Kertapati, Head of Seismotectonic and Geologic Quarter Division.

- **PUSLITBANGTEK Permukiman (Pusat Penelitian dan Pengembangan Teknologi Permukiman): Regional Institute for Research on Human Settlements Technology (RIHS), Ministry of Regional Development and Human Settlement**

  The Regional Institute for Research on Human Settlements Technology (RIHS), Pusat Penelitian dan Pengembangan Teknologi Permukiman

(Puslitbangtek Permukiman, PUSKIM), is one of three research institutes under the Agency for Research and Development, Ministry of Regional Development and Human Settlement. This research institute is responsible for research, investigation and dissemination of human settlements technology, covering housing, building, water supply, sanitation as well as urban and rural planning. It also prepares national standards on design codes, material specification and testing etc. for buildings and utilities.

The RIHS (PUSKIM) reviewed the Bandung local building regulation together with the City Building Office and engineers from EEG, and prepare documentation on design and construction of earthquake resistant non-engineered building for dissemination purpose in this project. The resource persons involved in this project follow are Ir. Samsu A. Trihadi (before retired), Ir. Sylvia F. Herina, M.Sc., and Ir. M. Ridwan

Provincial Level Organizations

- **KANDEPDIKNAS (Kantor Departemen Pendidikan Nasional): Regional Office of Department of National Education**

  Regional Office of Department of National Education is regional agency under the Ministry of National Education, which has responsibility to develop and monitor educational curriculum for junior high school and senior high school.

  Kandepdiknas gave aids in providing the necessary and relevant information in this project. The person who involved in this project from Kandepdiknas is Drs. Ketut Ardhana.

- **SATKORLAK PB (satuan Koordinasi Pelaksanaan Penanggulangan Bencana): Coordination Implementation Unit of Disaster Management**

  SATKORLAK PB is a non-structural body (ad hoc agency) in the regional level. It has a task to coordinate and lead disaster management activities in the SATKORLAK PB area and the governor of provincial as a chairman the Coordination Unit of Disaster Management.

Local Government Organizations

- **BAPPEDA (Badan Perencanaan Pembangunan Daerah): Local Agency for Regional Planning and Development, City Government of Bandung**

  The Local Agency for Regional Planning and Development, Badan Perencanaan dan Pembangunan Daerah (BAPPEDA) has an important role

in the city development planning.

In this project, BAPPEDA is one of the main local project partners. It coordinates all involved local government organizations and agencies in providing the necessary information/data, facilitates seminar and training or workshops, and communicates the project results to the Municipality. The main contact person from BAPPEDA is Dra. Kamalia Purbani, MPI, the current Head of Research Division, who was involved in the project from the early beginning stage. She participated in the UDM-1 course conducted by AUDMP-ADPC in Bangkok, in 1997.

- **DB (Dinas Bangunan): Building Office of Bandung**

Building Office of Bandung (known as Building Control Office in the beginning of the project) is in charge of implementing and control local building regulation, which include activities such as:

- Issuing building permit.
- Issuing warning letter to owner of buildings without permit, and in case of violation, terminate and execute the demolition of illegal buildings.
- Inspecting conformity of the regulation in the filed

In this project, the Building Office of Bandung is involved in capacity building of its controlling system (review of building monitoring and control system and training of its staffs). It also assists the project in providing building related information (status and number of city building stocks). The contact person from Building Office of Bandung is Ms.Hj. Sri Sulastri, BE.

- **Dinas Pendidikan Nasional (Local Office of Education)**

The Local Office of Education is responsible for the management of the elementary education in the city. It also oversees the provision of school buildings infrastructure for state owned schools. In the IUDMP, the Office collaborates in earthquake safety campaign for school children and provides the information for the school earthquake safety education. The contact person in this project is Drs. Novena.

- **DTK (Dinas Tata Kota): Urban Planning Department of Bandung**

The role of Urban Planning Department of Bandung is to oversee the urban development of the city based on general urban spatial plan/land use master plan (RUTRK) and detailed spatial plan (RDTRK). It issues land use permit and planning permit (Ijin Peruntukan Penggunaan Lahan and Advis Planning). Dinas Tata Kota provided information concerning the urban development of the city for IUDMP. It was also involved in the review of urban spatial planning to take into account the seismic safety issues raised

in the project. The contact person is Ir. Yul Zulkarnaen.

- **SATLAK PB (Satuan Pelaksanaan Penanggulangan Bencana): Disaster Management Implementation Unit of Bandung**

  SATLAK PB is the coordinating organization for disaster management at the local level. Its members consist of all Municipality division/department, local public utility agencies, health sector, Red Cross, police unit, local military commands, non-government organizations etc, chaired by the City Mayor. The SATLAK PB was set up in accordance with the BAKORNAS PB guidelines and it reports to the provincial SATKORLAK PB. Theoretically,, the responsibility of SATLAK PB covers all disaster management activities which include prevention, mitigation, emergency rescue and response, recovery and reconstruction stages.

  In this project, SATLAK PB was involved in the strengthening efforts of the disaster management organization. It also provided the project with all necessary information and contributing staffs time for the project implementation. Contact persons from SATLAK PB includes Drs. Priatna Danusubrata (Secretary of SATLAK PB), Mr. Uli Syamsudin (then retired), Drs. Dadang Setiawan (then moved to other office) and Mr Nana Tursino. Drs Dadang Setiawan participated also in the UDM-2 course in 1999.

Non Government/Semi-Government Organizations

- **Kelompok Studi Mitigasi Bencana - Institut Teknologi Bandung: Earthquake Engineering Research Group (EERG), of Institute Technology Bandung**

  Earthquake Engineering Research Group (EERG) was set up by the Institute for Research, Institute of Technology Bandung (LP ITB), to coordinate research work related to earthquake and tsunami disaster. It is also active in the monitoring of earthquake damage of several major important earthquakes in various region of Indonesia. The EERG had been involved in earthquake mitigation study and training in Flores earthquake (1993). In this project, EERG main role is to manage the IUDMP as well as providing technical input for its implementation. It provided the main human resource for the project, Prof. Dr. Ir. Gde Widiadnyana Merati, the Project Technical Adviser, Dr. Ir. Krishna S. Pribadi, Project Manager; Dr. Ir. Adang Surahman, earthquake engineer; Dr. Ir. I Wayan Sengara, geotechnic engineer; Dr. Ir. Nanang T. Puspito, seismologist; Dr. Ir. Harkunti P. Rahayu, Information and Networking Manager; Ir. Jodi Firmansjah, MSE., PhD and Ir. Mashyur Irsyam, MSE, PhD., resource persons (Indonesian seismic code and zoning).

- **P3WK-ITB (Pusat Penelitian Perencanaan Wilayah dan Kota - Institut Teknologi Bandung): Center for Urban and Regional Development Studies (CURDS) of Institute Technology Bandung**

  The Center for Urban and Regional Development Studies (CURDS) is one of the centers under the Institute for Research of the Institute of Technology Bandung (LP ITB). CURDS has many experiences with various studies and works with local governments on spatial planning, urban issues and public policies. In IUDMP, the Center deals with various aspects of urban development, spatial plans and public policy, in particular those related to the National Policy on Urban Disaster Mitigation. The Center provided also GIS services for mapping purposes and in particular for the vulnerability analysis. The resource persons from the Center include Prof. Dr. Ir. Tommy Firman, Dr. Ir. B. Kombaitan, Ir. Ibnu Syabri, M.Sc., Ir. Andi Oetomo, MPl and Ir. Iwan P. Kusumantoro, M.Sc.

- **LPM-ITB (Lembaga Pengabdian Masyarakat - Institut Teknologi Bandung): Institute for Community Services, Bandung Institute of Technology**

  The Institute for Community Services is an organization within the Bandung Institute of Technology (ITB), in charge of its outreach program, providing various government organizations and community groups with its expertise. The LPM-ITB is one of the selected NPTIs (together with BADAN DIKLAT of the Ministry of Home Affaires) for the implementation of UDM training institutionalization. The contact persons include Dr. Purnomo Soekirno and Dr. Syahril B.K.

Mass Media

- **Pikiran Rakyat Newspaper**

  Pikiran Rakyat Newspaper is a local newspaper with quite broad circulation (it covers also the whole West Java Province and some other provinces in Java and Sumatra). The media was started to be involved when the project collaborated with the RADIUS Project to develop an earthquake scenario because of its experience in communicating with the people. Later on, the media became more involved by disseminating to the public the information gained during the project. Eventually, the newspaper was asked by the project to organize a journalist training/workshop, which run successfully. Resource persons from the media were Dra. Ida Farida, Moh. Ridlo Eisy, MBA, Drs. Teguh Laksana and Dra. Ella Yuniaperdani.

- **RASE FM (Radio station)**

Mr. Delyana, the station broadcaster was involved initially in the earthquake safety education for school children as the workshop facilitator. Further on, the radio station helped broadcasting programs on earthquake public education, which got a lot of responses from its listeners.

- **Individual: Mr. Teddy Boen**

  Mr. Teddy Boen is a consulting engineer and has more than 30 years experience in earthquake mitigation activities, in particular for non-engineered buildings. He is author to many guideline documents in earthquake resistant building practices, including various reports and recommendations on repair and strengthening of earthquake damaged buildings in various parts of Indonesia. Mr. Teddy Boen is one of the Project Advisors to the IUDMP, and also an important resource person for various workshops and training conducted by IUDMP.

5.0 PREPARATION PROCESS

The IUDMP Proposal, focusing on earthquake hazard mitigation in the City of Bandung, was formulated by a joint EERG - CURDS team, led by Dr. Krishna S. Pribadi, in 1996. Mr. Teddy Boen provided input and advises on the content of the proposal.

During the initial stage of the Project (before Grant Agreement signing), work includes contacting and presenting Project Proposal to various relevant agencies and institutions was carried out. A workshop for presenting the project was conducted in mid 1996.The purpose of the presentation was to get commitment from various agencies and institutions to actively support the Project. Type of hazard selected for the project was a lively discussion subject, and earthquake mitigation was finally agreed as the focus of the project based on the reasons proposed in the proposal.

In the beginning, local government organizations from the adjacent Kabupaten (Regency) of Bandung were involved in the discussions, but later on it was decided to limit the project area on the Municipality to obtain a more focused study.

Official Letters stating the involvement and support from various agencies and institutions, i.e. the Research Institute for Human Settlements (PUSKIM), the Geological Research and Development Center (GRDC), and the Municipality of Bandung, were obtained by the Institute for Research ITB and appended in the Project Proposal submitted on July 1996.

The IUDMP was officially begun on 1st March 1997. A project working group was

set up consisting of representatives from various involved organizations and experts from EERG and CURDS, chaired by Dr. Krishna S Pribadi as the Project Manager. The working group members were assigned as the member of a Disaster Mitigation Task Force set up by the Institute for Research, ITB, and a Project Secretariat was set up in ITB, at the Civil Engineering Department premise. Coordination meetings among the involved institutions and agencies to define each party's role and responsibility in the Project were set up.

Framework for project objectives and indicators was developed with the help of Ms Jean (Jinx) Parker, an AUDMP consultant. Life of Project Implementation Work Plan and other reporting forms were later developed with the help of AUDMP Project Manager. Financial accounting set up was developed together with the help of ADPC Financial Manager.

For the purpose of risk assessment process, a base map of the city has to be defined as the basic unit for GIS analysis. During the preparation stage, secondary data including maps were collected from different organizations and after agreement has been reached on the scale and form of the base map, it was then digitized into the GIS database.

6.0 PROJECT ELEMENTS

6.1 Overview

The activities of Indonesian Urban Disaster Mitigation Project (IUDMP) in Phase I consist of assessing the risk faced by the City, focusing on earthquake hazard and vulnerability of the city, and preparing an implementable mitigation strategy. Phase I also includes review of the existing national policy on disaster management and mitigation. Networking with various relevant organizations was given priority in this phase and several models of networking have been developed. A framework for a web site which was expected to stimulate project information exchange and dissemination was also developed in this phase.

The mitigation strategy and an action plan for earthquake mitigation was formulated during the project strategy workshop held in Lembang, Bandung, in April 1998. In this workshop, issues regarding seismic risk mitigation, awareness and preparedness in Bandung area were discussed, with the objective to improve the city urban planning, building regulation environment and emergency preparedness and awareness at the local level. Based on the workshop result, a set of mitigation strategy has been formulated and plan for implementing various actions has been developed by the end of Phase I.

From the proposed action plan, several activities had been selected for implementation in IUDMP Phase II, which covers the set strategy on improving building and urban development regulation environment, raising public

awareness and improving emergency response mechanism. All elements were considered in four major project components, i.e. demonstration project, policy input, networking and information and education campaign, and training program.

In the demonstration project component of Phase II, a pilot project of city spatial plan review with regard to seismic safety has been conducted and a technical guideline for a complete spatial plan review was developed. Local building regulation and building control monitoring system were reviewed and recommendation for improvement had been proposed. In addition, the demonstration project coverage had been enlarged by a shift from a single hazard to multi hazard mitigation, by implementing an activity directed at increasing public awareness to flood hazard in the city and the mitigation of its impact.

Policy input component had been focused on capacity building of local disaster management unit (SATLAK PB), which includes improvement of Standard Operation Procedure (SOP) and its socialization, support for establishing local emergency operation center, and preparation and development of city operational emergency plan for seismic disaster.

The information, education campaign and networking component activities had been focused on expanding the network, improving the KOMPAK website, conducting earthquake awareness program in public elementary schools and in the mass media (newspaper and radio broadcast). Efforts had been also put to realize the establishment of the Center for Research on Disaster Prevention and Mitigation in ITB, which will provide continuous focus on mitigation activities in the country and to maintain the networking scheme after the end of the Project.

Several training programs were implemented during this second phase, i.e. training for the Municipal Building Department staffs on building monitoring system and disaster awareness training for journalists. The planned institutionalization of UDM training program through collaboration with National Training Partner Institutions (NPTI) had not been realized, due to some unexpected problems (changes in the selected NPTI organizations)

The project component of IUDMP in Phase I and Phase II is summarized in Figure 1.

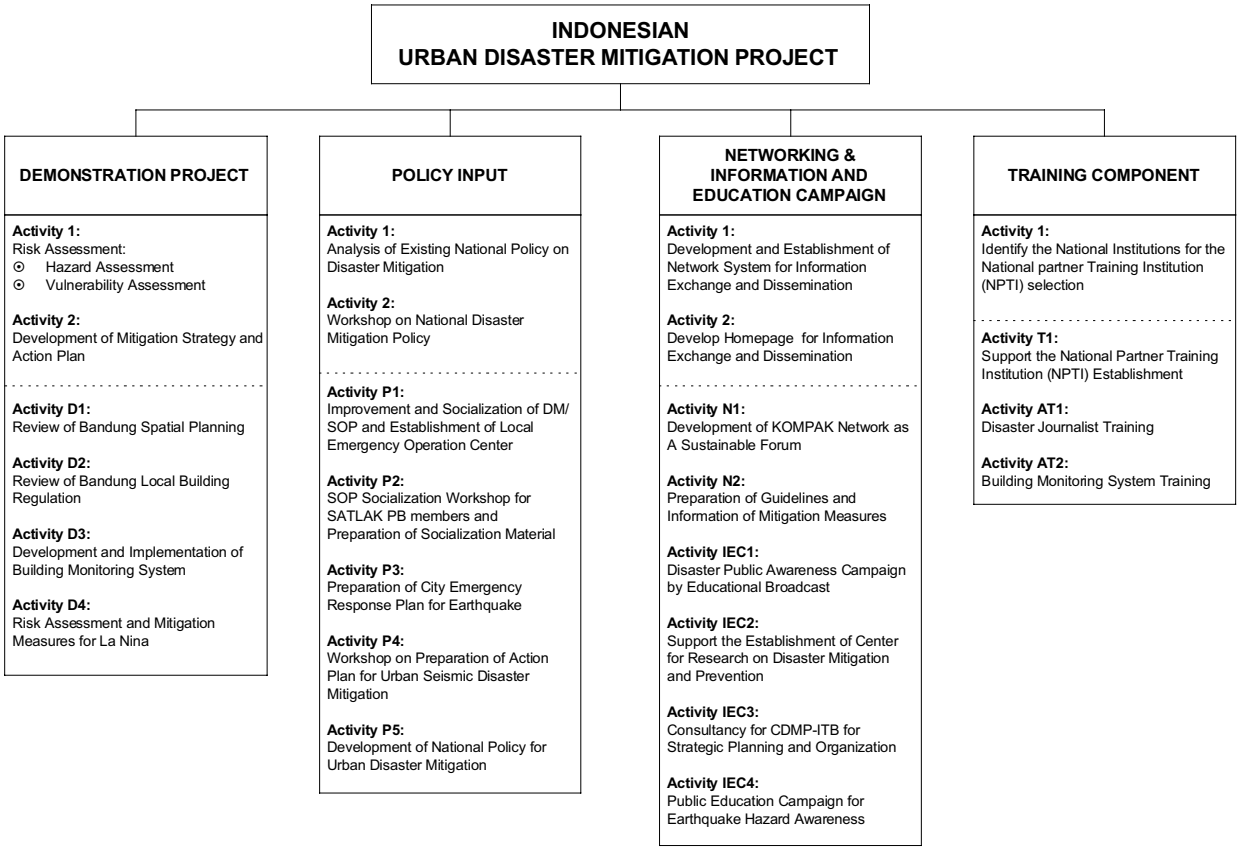

Figure 1 IUDMP Project Compenent

6.2 Demonstration Project Component

Activities under the Demonstration Project component follow:

Under IUDMP Phase I

Activity 1: "Risk Assessment: Hazard and Vulnerability Assessment"

Objective:

- To assess the level of seismic risk faced by the city of Bandung.

Scope of Work:

- Assessing the seismic hazard of the city
- Assessing vulnerability.
- Hazard mapping

Implementation:

The implementation stages follow:

1. Conducted a series of meetings with project participants, for:
   - Team building process
   - Gaining mutual understanding on the approach for the project
   - Developing scope of works and time schedule
   - Inventory of available data and information
   - Monitoring progress achieved and problem encountered

2. Analysis of seismic history, soil and geologic condition, and other relevant parameters, in order to establish seismic hazard level of the city in term of PGA (peak ground acceleration), analysis of collateral hazard, prepare hazard maps.

3. Assessing vulnerability based on available information on building condition, physical infrastructure, demographic and socio-economic indicators, disaster response preparedness, at sub-district level. Combining urban vulnerability parameters with hazard level provides information for comparing the relative seismic risk level between each sub-district in the city.

4. Visit to selected sub-districts with highest risk provides more insight on the vulnerability situation.

5. A one-day workshop on "Seismic Risk Assessment in the Bandung Municipality" was conducted in 9 October 1997, inaugurated by Vice-Mayor of the Municipality of Bandung. The objective was to disseminate the result of the risk assessment study and create awareness among the project stakeholders who attended the workshop. Representatives from ADPC, Dr. David Hollister, Mr. Aloysius J. Rego and Mrs. Suthira Suwanarpa were present at the workshop. Participants from other cities in the region (West Java) were also invited and represented at the workshop.

6. A collaborative work with the UN-IDNDR sponsored RADIUS Project developed another approach for the risk assessment through an earthquake scenario development, where damages due to a possible major earthquake were analyzed and possible emergency situation was simulated, based on the preparedness assessment of various agencies and emergency response organizations. The scenario development and the associated workshops during the process have enhanced the risk awareness in the city.

Output (Product):

- Risk Analysis Document
- Hazard and vulnerability maps
- Earthquake scenario
- Damage assessment
- Preparedness assessment

Involved Organization:

- EERG-ITB
- CURDS-ITB
- BAPPEDA
- Building (Control) Department of Bandung
- Urban Planning Department of Bandung
- GRDC
- PUSKIM

- SATLAK PB

Activity 2: "Development of Mitigation Strategies and Action Plan"

Objective:

- To develop a simple earthquake mitigation strategy and plan for mitigation action projects.
- Participatory mitigation planning process to collect input from various stakeholders.
- Formulating mitigation strategy and mitigation action plan.

Implementation:

Participatory mitigation planning process through a couple of workshops:

- Conducting a one-day workshop on "Development of Strategy and Action Plan for Earthquake Mitigation in the Municipality of Bandung", held on 4 April 1998. The objective was to exchange views related to seismic risk of the city and to what can and should be done to mitigate it.

- In collaboration with the RADIUS Project, conducting a one-day Action Plan Workshop, where a draft of Strategy and Action Plan was presented and comments and input were collected for improvement of the Action Plan.

By the end of the process, a set of mitigation strategy (short term, mid term and long term) has been formulated, which consist of a set of proposed projects (activities) i.e. improving urban planning environment, improving building regulation environment, and improving emergency preparedness and public awareness.

Output (Product):

- A forum to share the experience on disaster mitigation with other relevant agencies and cities in the country.
- Mitigation Strategies Recommendation.

Involved Organization:

- BAPPEDA
- PUSKIM
- EERG
- CURDS

Under IUDMP Phase II

Activity D1: "Review of Bandung Spatial Planning with regard to seismic safety, and preparation of technical guideline for implementation by the

Municipal Urban Planning Office"

Objective:

- To improve the existing Bandung Spatial Plan (RTRWK) by taking into consideration the seismicity of the region, incorporating the risk assessment result of the IUDMP Phase I.

Scope of Work:

- Evaluation of existing city wide general spatial plan (RTRWK) to select the most vulnerable area in the regard of seismic safety, and using it as a case study to improve the detailed spatial plan (RDTRK) of this area.
- Rewriting the process of reviewing and improving RDTRK into a technical guideline format that can be used by the Municipal Planning Office to replicate the process for other RDTRK.

Implementation:

The activity had been completed by end of January 2000. The implementation of the activities follow:

1. Conducted a series of meetings with project participants, for:
   - Team building process
   - Gaining mutual understanding on the approach for the project
   - Developing scope of works, methodology and time schedule
   - Inventory of available data and information to be used as evaluation indicators
   - Monitoring progress achieved and problem encountered

2. Field survey and compilation of macro indicator data for evaluation of general spatial plan. Based on these, evaluation of city scale spatial plan was conducted with emphasis on earthquake safety.

3. Selection of sub-district with high seismic risk for case study and analysis, and conduct a detail survey.

4. Prepared input to improve the general spatial planning (RUTRK) of the Municipality of Bandung.

5. Workshop on "Review of Bandung Spatial Planning with regard to Seismic Safety" was conducted on November 3, 1999 at Santika Hotel Bandung and inaugurated by the Mayor of Bandung, Mr. AA Tarmana. The objective was to disseminate the result of study on review of Bandung Spatial Planning, and to collect input from workshop participants to improve the result of study and to develop technical guideline. The workshop was attended by 45 participants from government institutions at national level (BAPPENAS, GRDC, PUSKIM, etc.), provincial level (SATKORLAK PB, BAPPEDA, etc.), and municipal level (BAPPEDA, Building Control Office – DPB, Urban

Planning Office – DTK, Department of Public Works – DPU, SATLAK PB, etc.), private sectors, educational institutions, NGO's and journalist.

The input collected during the workshop was used to improve the result of study and to develop technical guideline on review of spatial planning with regard to seismic safety. It was hoped that this guideline could be used as guidance for replication in other cities in Indonesia.

6. Prepared the final report on Review of Bandung Spatial Planning.

Output (Product):

- Recommendation to improve the Bandung Spatial Plan (RTRWK) based on the result of study.
- Technical guideline for reviewing and improving RTRWK with regard to seismic safety.

Involved Organization:

- CURDS - ITB
- BAPPEDA Tk. II - Kotamadya Bandung
- Dinas Tata Kota - Kotamadya Bandung

Activity D2: "Review of Bandung Local Building Regulation with regard to seismic safety, and preparation of technical guideline for implementation by the Municipal Building Control Office"

Objective:

- To improve the existing Bandung Local Building Regulation in the purpose of reducing the risks of building failures caused by earthquake, using the latest information obtained in the IUDMP Phase I.

Scope of Work:

- Desk study of the most recent local building regulation in the Municipality of Bandung and various references on the relevant national building codes.
- Reviewed of IUDMP Phase I result on Bandung seismic risk assessment.
- Formulation of recommendation for the improvement of the Regulation.
- Preparation of a guideline of implementation of the building regulation, for both the Building Control official and the community/user, with reference to the information on specific local condition, such as seismicity, geologic and soil condition and the vulnerability of the area.

Implementation:

By the end of March 2000, the activity had been completed. The activities includes:

1. Literature study and digest of study, including review of all existing codes,

standards, specification and regulations related to building regulation in Indonesia such as Decree of Minister of Public Works No. 441/KPTS/1998 dated 10 November 1998 on Technical Guidelines for Building issued by Directorate General of Cipta Karya, Department of Public Works.

2. Intensive discussion and reviewing the content of Bandung Building Regulation, involving related institutions such as Building Control Department and PUSKIM.

3. Preparing and developing input for seismic provision of the local building regulation.

4. Developing and distributing questionnaire to the staffs of Building Control Department, City Planning Department and Public Works Department with the purpose to collect information on the level of comprehension of Bandung Local Building Regulation.

5. Developing supplementary document to the existing Building Regulation, containing additional explanation pertaining to seismic provisions based on the project result.

6. In mid February 2000, a socialization of the updated Building Regulation among the officials and staffs of the relevant institutions, i.e. the Building Office, City Planning Office, BAPPEDA, and Public Work Office was conducted in a meeting.

Output (Product):

- Recommendation for the improvement of the existing Bandung building regulation.
- Supplementary technical guideline attached to the existing Bandung building regulation.

Involved Organization:

- Puslitbang Permukiman - Center for Research and Development of Human Settlement, Ministry of Regional Development and Human Settlement
- EERG - ITB
- Dinas Bangunan - Kotamadya Bandung
- Dinas Tata Kota - Kotamadya Bandung

Activity D3: "Development and implementation of building monitoring system for the Municipal Control Office"

Objective:

- To develop building monitoring system.

Scope of Work:

- To evaluate the existing building monitoring system.
- To define the needs of a better building monitoring system with reference to the new local building regulation.
- To formulate improvement to the existing building monitoring system, which will provide sufficient database and information for disaster mitigation and planning purpose.

Implementation:

D3 Activity completed by end of June 2000.The activity includes following steps:

1. Conducted a series of meetings with project participants, for:
   - Team building process
   - Gaining mutual understanding on the approach for the project
   - Developing scope of works, methodology and time schedule
   - Inventory of available data and information on existing monitoring and controlling process that was used for evaluation
   - Monitoring progress achieved and problem encountered

2. Comparison study to other cities, i.e. City of Jakarta and City of Semarang. Some information on monitoring and controlling process used by both of city government were collected, evaluated and analyzed. The benefits and difficulties of the system were evaluated and compared. The result was used to improve the existing building monitoring system in Bandung.

3. Developing improved building monitoring system, which involves the addition of some technical aspects with emphasis on seismic safety. Discussions with related institutions such as Building Control Department, BAPPEDA, PUSKIM and expert from ITB were conducted to collect more input to improve the system.

4. Develop and distribute questionnaire for Building Control Department, especially to the field staff, to collect input on the implementation side of the system.

5. Finalize the proposed recommendation and development plan for improved building monitoring system.

Output (Product):

- Recommendation to improve the existing building monitoring system used by the Local Building Office.

Involved Organization:

- Dinas Pengawasan Bangunan - Kotamadya Bandung
- EERG – ITB

Activity D4: "Multi hazard activity: Risk assessment and mitigation measures for La Nina related disaster in Bandung Basin"

Objective:

- To raise awareness among the local community in Bandung city and the Regency of Bandung potentially affected by flooding during La Nina atmospheric event

Scope of Work:

- Coordination with the City of Bandung and Regency of Bandung
- Preparation of flood hazard map
- Awareness sessions with various local community groups and NGOs

Implementation:

The activity had been completed by the end of April 1999. Activities carried out for implementation follow:

1. Conducted a series of meetings with project participants, for:
   - Team building process
   - Gaining mutual understanding on the approach for the project
   - Developing scope of works, methodology and time schedule
   - Inventory of available data and information
   - Monitoring progress achieved and problem encountered

2. Prediction of future rainfall intensity and distribution in the region to estimate future flood and landslide areas (based on sloped information and soil types).

3. Prepare and develop flood hazard maps for Municipality of Bandung and Regency of Bandung.

4. Prepare and develop an early warning system in collaboration with SATLAK PB of the Municipality of Bandung and the Regency of Bandung.

5. Update database on La Nina progress with new rainfall data and river section measurement and update the early warning system.

6. Prepare and distribute public awareness materials on La Nina phenomena and flood hazard in collaboration with some NGOs and student groups.

7. Conduct several meetings to consolidate the program and participate on public awareness sessions, such as:

   - Presentation and discussion with the Bandung Heritage Society (NGO for preservation of Bandung cultural heritages), on 6 November 1998.
   - Presentation and discussion with the Local Artist Association for their

participation in community awareness program, on 24 November 1998.
- Radio broadcast talk show on La Nina and flood risk in Bandung, on 27 November 1998.
- Meeting with various interest groups (students, NGOs, etc.) to discuss things that could be done to mitigate the flood risks, on 30 November 1998.
- Presentation at the Christian University of Maranatha, on 15 December 1998.
- Presentation at the SATLAK PB training, on 16 to 19 December 1998.
- Presentation at the City Health Office, on 16 December 1998.
- Presentation and discussion with Masyarakat Lingkungan Binaan (the Society for Built Environment), on 24 December 1998.

The awareness sessions usually includes explanation of the La Nina phenomena and its effect to Indonesian climate, type of hazards faced by the City of Bandung, what and how to prepare the city from flood hazard, and how to collaborate among various organizations and institutions.

By the end of the process, a final report was prepared, containing recommendation and suggestion on what to do to anticipate the flood hazards.

Output (Product):
- Flood hazard map for the Municipality of Bandung and the Regency of Bandung
- Recommendation for early warning system implementation.
- Workshop sessions on awareness and preparedness for flood with various local community groups

Involved Organization:
- Laboratory of Hydraulic, Department of Civil Engineering ITB
- SATLAK PB Municipality of Bandung and Regency of Bandung

6.3 Policy Input Component

Activities under the Policy Input component follows:

Under IUDMP Phase I

Activity 1: "Analysis of Existing National Policy on Disaster Mitigation"

Objective:
- To develop and propose input to improve the existing national policy on urban earthquake mitigation.

Scope of Work:

- Analysis of existing national urban disaster mitigation policy
- Formulation of improved urban disaster mitigation policy in terms of earthquake mitigation
- Preparation of national urban disaster mitigation policy implementation plan recommendations.

Implementation:

Implementation of activity covered the following:

1. General evaluation of the national disaster management system in Indonesia and identifying critical aspects to consider in improving the system. The evaluation includes the effectiveness, adequacy, responsiveness and appropriateness of the existing system.

2. Analyze and review the existing national policies on disaster management and mitigation.

3. Prepare and propose a TOR (Term of Reference) for in depth study on the national policies on urban disaster mitigation.

Output (Product):

- Input to improve the existing national policy on urban disaster mitigation.

Involved Organization:

- EERG
- CURDS
- BAKORNAS PB
- BAPPENAS

Activity 2: "Workshop on National Disaster Mitigation Policy"

Objective:

- To disseminate the result of the review of the existing national policy on disaster mitigation.
- To collect input for future improvement of the national disaster management system and policy.

Scope of work:

- Preparation of workshop program and material.
- Implementation of the workshop.

Implementation:

On 22 April 1998, The National Policy Workshop on Disaster Mitigation was held in East Auditorium of ITB. The workshop has involved 48 project participants,

representing Bandung municipality officials, various national agencies dealing with disaster management, journalist and interest groups.

The discussions in the workshop were essentially divided into three parallel interest groups, which focused on three issues:

1. Related disaster mitigation aspects in regional and urban spatial planning
2. Coordination of disaster management activities at the local level, and
3. Proposed mid term and long term disaster management activities.

To stimulate participants in developing ideas and initiatives, the workshop was initiated by some expert presentations introducing the national natural disaster management system in Indonesia, the evaluation of disaster management system in Indonesia, and the concept of natural Disaster Management. The presenters of these issues were Mr. Soetarso from BAKORNAS, Mr. Teddy Boen from ISET and Prof. Dr. Soeriatmadja from ITB Research Institute consecutively.

Output (Product):

- Recommendations to improve the system and policy on disaster management at national and local level based on the workshop result.

Involved Organizations:

- EERG
- CURDS
- BAKORNAS PB
- BAPPENAS

Under IUDMP Phase II

Activity P1: "Improvement of Standard Operating Procedure (SOP) in the local DM unit (SATLAK PB Bandung), and support for local Emergency Operation Center establishment (RUPUSDALOP PB)"

Objective:

- To produce an improved, user friendly, document of Standard Operating Procedure in the local DM unit / SATLAK (PROTAP)
- To support the establishment of the local Emergency Operation Center (EOC) establishment.

Scope of Work:

- Review of existing PROTAP and other supporting documents, including consultant's input (Shirley Mattingly).
- Preparation of improved SOP document.
- Conduct a coordination workshop to obtain input from SATLAK member organizations for the improvement of the SOP.

- Finalize SOP documents.
- Prepare information support for EOC.

Implementation:

By the end of August 1999, Disaster Management Standard Operating Procedure for the City of Bandung was completed and distributed to the members of SATLAK PB.

The carried out activities are described below:

1. Coordination meeting and discussion on the method to improve the SOP and to support the establishment of the Emergency Operation Center (RUPUSDALOP PB) in the Municipality of Bandung with BAPPEDA and SATLAK PB. The work plan and schedules for DM/SSOP improvement activities and for its socialization was developed in this meeting.

2. Establish a working group consisting of SATLAK PB staffs and IUDMP team to conduct this improvement.

3. Prepare a new draft of DM/SOP based on the existing document and recommendation from ADPC Consultant, Ms. Shirley Mattingly.

4. Distribute the new draft of DM/SOP to the members of SATLAK PB to get more input on how to improve the DM/SOP.

5. Finalize the new DM/SOP incorporating comments and inputs collected during the workshop.

6. Distribute the new DM/SOP to the member of SATLAK PB.

The activity for establishment of the Emergency Operation Center (RUPUSDALOP PB) at the Municipality of Bandung was started on September 1999 led by ADPC Consultant, Ms. Shirley Mattingly. A one-day workshop on “Establishment and Operation of RUPUSDALOP PB” was conducted on September 23, 1999 at Royal Merdeka Hotel, inaugurated by Mr. Priyatna Danusubrata, the Secretary of SATLAK PB, and attended by 25 participants as representative of organization members of SATLAK PB. The workshop was designed to:

- Define needs, concepts of operations, and development and implementation plan for the RUPUSDALOP PB.
- Familiarize participants with the concepts, functions and use of the RUPUSDALOP PB.
- Develop a model for use in other cities.

As a result of the workshop, a working draft on establishment and operation of

RUPUSDALOP PB in the Municipality of Bandung, i.e. RUPUSDALOP PB: Development Plan, Standard Operating Procedures (SOP), and Workbook and Orientation Guide has been developed.

Output (Product):

- An improved and user-friendly SOP document.
- Basic documents needed to support EOC establishment: SOP, Development Plan and Orientation Work Book on EOC.

Involved Organization:

- IUDMP- ITB
- SATLAK PB - Kotamadya Bandung

Activity P2: "SOP socialization workshop for SATLAK PB members, and preparation of socialization materials"

Objective:

- To socialize the SOP among the SATLAK members in order to obtain a common understanding of disaster management procedure.

Scope of Work:

- Preparation of socialization documents.
- Conduct a coordination workshop to disseminate the Standard Operating Procedure among SATLAK members.

Implementation:

The one-day workshop on "Development and Socialization of DM/SOP" was conducted on March 29, 1999 at Bale Pakuan Convention Center Bandung. The workshop was inaugurated by the Assistant for the Administration of Development, on behalf of the Mayor of Bandung, and chaired by Mr. Kusnadi, the Chief Executive of SATLAK PB. The Organizing Committee was chaired by Mr. Tjetje Subrata, the Head of Social Division, and the Steering Committee chaired by Mr. Priyatna Danusubrata, the Secretary of SATLAK PB. The workshop was attended by 48 representatives from 63 invited member organizations. The objective of the workshop was to socialize the new DM/SOP to the SATLAK PB member organizations and to collect new input from participants to improve the disaster management guideline of the city, which evolved toward a consolidated disaster management plan. The input from participants was positive and they were very supportive to the SOP development initiative. One of the recommendations emanating from the workshop is to establish the mandated Emergency Operation Center.

Output (Product):

- Well-informed and committed SATLAK members on the Standard Operating Procedure.

Involved Organization:

- IUDMP - ITB
- SATLAK PB - Kotamadya Bandung

Activity P3: "Preparation of City Operational Emergency Plan for Earthquake (City Emergency Response Plan for Earthquake), and Workshop on City Operational Emergency Plan"

Objective:

- To develop a plan for the city emergency response unit to operate effectively and efficiently during an emergency situation caused by an earthquake. The emergency operation is addressed to save/rescue people, to reduce suffering/anguish and to reduce economic financial losses due to the disaster.

Scope of Work:

- Define emergency situation and emergency response stages during a seismic disaster.
- Identify actions to be taken during theses emergency response stages.
- Identify responsible organizations/institutions involved in each emergency action.
- Describe task and responsibility of each organization in this plan.
- Define coordination procedure within the city emergency response unit in order to achieve an integrated and coherent response to the emergency situation.
- Provide a standard response time and operation duration for each type of intervention.

Implementation:

The activity for implementation follows:

1. Team consolidation and coordination meeting with related institutions such as SATLAK PB, RS Hasan Sadikin (general hospital), and others.

2. Define and determine terms to be used in the guideline, functional areas, and the responsible organizations.

3. Develop policy and strategy.

4. Develop and define the Technical Implementation Unit and its relationship at emergency situation.

5. Develop and disseminate the Guideline for City Emergency Response Plan for Earthquake to the related institutions to get more input to improve the operational plans.

6. Finalize and improve the guideline based on input collected during discussions with related institutions.

7. One-day workshop on "The City Emergency Response Plan for Earthquake Disaster in Bandung" on March 14, 2000 at BPI Building ITB. The objective of the workshop is to socialize the proposed draft of earthquake emergency response plan for Bandung City and to collect input for improvement from participants representing agencies involved in emergency response situation. The workshop, organized jointly by the Institute for Research, ITB (represented by IUDMP Project Management Unit) and the Geological Research Development Center (GRDC), Ministry of Mining and Energy, attended by 15 representatives from Bandung SATLAK PB members, such as the Social Division, Fire Department, Red Cross, Civil Defense Office, Health Department, Local Planning Agency, etc.

8. It was concluded that, in general, the participants accept the proposed guideline, subject to some further refinement and fine-tuning, for further adoption as a technical guideline on earthquake disaster emergency response to be attached to the SATLAK PB Standard Operating Procedure (SOP / PROTAP PB) as a specific annex.

Output (Product):

- An operation/technical guideline describing an operation plan for the city emergency unit (SATLAK) during an emergency situation caused by an earthquake/seismic disaster.

Involved Organization:

- Puslitbang Geologi - Dept. Pertambangan dan Energi (GRDC)
- SATLAK PB - Kotamadya Bandung

Activity P4: "Workshop on Preparation of Action Plan for Urban Seismic Disaster Mitigation" (collaboration with RADIUS Project)

Objective:

- To prepare an applicable Action Plan for urban seismic risk reduction for the City of Bandung through participatory approach, which involves various relevant organizations such as lifeline and infrastructure provider, emergency response unit, health sector etc.

Scope of Work:

- To prepare an Action Plan Workshop, which will optimize the involvement of the related institution/organizations.
- To prepare an improved Action Plan based on the input collected in the workshop.

Implementation:

The RADIUS Working Group collaborated with the IUDMP Team in preparing and developing the Bandung Action Plan for Earthquake Mitigation. The Action Plan was developed by considering the damage analysis of lifeline infrastructure based on an earthquake scenario. The result of IUDMP Phase I, such as hazard maps, vulnerability maps, etc., was used to develop the Bandung Earthquake Scenario.

The earthquake scenario, damage analysis of lifeline infrastructure and draft of action plan was presented at the RADIUS Action Plan Workshop, held on April 14, 1999 in West Hall ITB. The workshop was inaugurated by Secretary of the Municipality of Bandung, on behalf of the Mayor of Bandung, and attended by 75 participants representative from central government institutions (BAKORNAS PB, Ministry of Home Affairs, GRDC, PUSKIM and Directorate of Volcanology), provincial government institutions (SATKORLAK PB, BAPPEDA and BAPEDALDA), municipal and regency institutions (DPB, DTK, BAPPEDA, SATLAK PB, etc.), others organizations and institutions (PLN, TELKOM, PDAM, ITB, mass media), and some international and national advisory members, i.e. Mr. Kaneko Fumio from OYO Corp., Mr. Jack Rynn from CERA, Australia, and Mr. Teddy Boen, national earthquake mitigation expert.

The objective of the workshop was to present and discuss the draft of action plan, which was developed based on the developed earthquake scenario and to collect input from participants to improve the Plan. The action plan had been completed in October 1999 and was reproduced by the City for distribution.

Output (Product):

- Strategy on how to mitigate the seismic risk in the city, which can be implemented and carried out by every competent institution.

Involved Organization:

- BAPPEDA Tk. II - Kotamadya Bandung

Activity P5: "Development of National Policy for Urban Disaster Mitigation"

Objective:

- To formulate a national policy for urban disaster mitigation to be integrated in the urban development program.

Scope of Work:

- Study on the needs for formulating an integrated national policy for urban disaster mitigation as part of the national urban development policy based on the result of IUDMP Phase I on the evaluation of the existing national disaster mitigation policy,
- Identification of the strategic elements of the national urban disaster

mitigation.

- Formulate recommendation for an improved urban disaster mitigation policy within the national urban development program.

Implementation:

The carried out activity follows:

1. Conduct a series of meetings with project participants, for:
   - Team building process
   - Gaining mutual understanding on the approach for the project
   - Developing scope of works, framework and time schedule
   - Inventory of available data and information
   - Monitoring progress achieved and problem encountered

2. Consultation and discussion with Ms. Shirley Mattingly through electronic mail.

3. Improve the design of the study with input from Ms. Shirley Mattingly.

4. Prepare checklist of resource persons for interview of policy substances with BAKORNAS PB and BAPPENAS.

5. Develop the Draft for a National Policy on Urban Disaster Mitigation.

6. Propose the Draft to the BAKORNAS PB for commentary.

Output (Product):

- National policy for urban (seismic) disaster mitigation formulated.

Involved Organization:

- CURDS - ITB
- BAKORNAS PB

Activity AP1: "Workshop on National Policy and Lessons Learned Workshop"

Objective:

- To provide an event as a national/regional platform for exchange of information on the lesson learned from urban disaster mitigation project experience.

Scope of Work:

- Development of TOR describing the objective, theme of discussions, desired result etc. for the meeting.
- Establish contact with prospective participants.

- Prepare materials for the meeting.
- Conduct the workshop.

Implementation:
The workshop, organized jointly by the Secretariat of BAKORNAS PB and the Institute for Research, ITB (represented by IUDMP), inaugurated officially by the Minister Coordinator of Social Welfare and Poverty Alleviation (as Chairman of BAKORNAS PB) and attended by 50 representatives from relevant national level organizations/institutions/agencies (members of BAKORNAS PB), as well as by some representatives from local government organizations (City of Jakarta and Bandung). Funding comes from the Secretariat of BAKORNAS PB and IUDMP Phase II.

The objective of the workshop is:

1. To showcase the experience of City of Bandung in implementing UDM Program
2. To get national support and commitment on the importance of developing and implementing a national policy on urban disaster mitigation in Indonesia, and to discuss the feasibility of adopting the proposed National Policy on Urban Disaster Mitigation (drafted in the framework of the IUDMP), from the technical, economical, political and administrative feasibility points of view, as a public policy in Indonesia.

During the discussion session, the workshop participants, moderated by Andi Oetomo, divided into three groups discussing the following themes:

- Technical feasibility of the policy
- Socio-enonomic feasibility of the policy
- Political and administrative aspects of policy implementation

Output (Product):
- Proposed Draft of National Policy on Urban Disaster Mitigation.

Involved Organization:
- CURDS - ITB
- BAKORNAS PB

6.4 Networking, Information and Education Campaign Component

Activities under the Networking, Information and Education Campaign component follow:

Under IUDMP Phase I

Activity 1: "Development and Establishment of Network System for Information Exchange and Dissemination"

Objective:

- To establish a forum for discussion, dissemination and exchange the information on urban disaster mitigation activities.

Scope of Work:

- Networking system establishment
- Information exchange and dissemination

Implementation:

The activities carried out follows:

1. Viewing several alternatives for the development of networking model. The model consists of short term and long term development plans. In the short term the IUDMP act as a central node organizing the network, while in the longer term all member nodes (all participants, stakeholders and others) have opportunity and responsibility toward the success of the network, the national urban disaster mitigation network. To look for further possibility in networking, a seminar on GIS for Urban and Real Estate Use, organized by LGPI, a Jakarta based NGO in promoting the use of GIS for various applications in urban management, on August 28, 1997, had been attended.

2. Producing the networking scheme, detailed networking plan and a list of networking participants.

3. Develop the system for workspace communications, i.e. FTP-1 and FTP-2.

Output (Product):

- A national network on urban disaster management and mitigation established

Involved Organization:

- EERG
- CURDS
- BAKORNAS PB

Activity 2: "Develop Homepage for Information Exchange and Dissemination"

Objective:

- To create platform/media for dissemination of information on disaster management related issues.
- To disseminate information on disaster management related issues.

Scope of work:

- Establish a media for information dissemination.
- Develop and prepare information, which would be disseminated.

Implementation:

The activity was implemented parallel with Activity 1. The activity begun with the selection of Internet connection provider and PT. Zantara Net was selected to implement homepage development. Collaboration with PT Zantara Net was in the technical terms. Meanwhile, the IUDMP prepared information that would be up loaded. A web site homepage, http://www.kompak.or.id, was established for networking and dissemination of information. The web-site homepage of IUDMP (KOMPAK) was demonstrated during the National Policy Workshop, and interest from participants has been recorded. At the occasion, representative from the national Disaster Management Coordinating Board (BAKORNAS PB) who was involved in the development process of their own disaster management information system showed their interest to link the web site into their system, reciprocally. This link enriched the national information network with the city initiative example on mitigation activities.

Output (Product):

- KOMPAK Homepage, http://www.kompak.or.id

Involved Organization:

- IUDMP
- PT. ZANTARA NET

Under IUDMP Phase II

Activity N1: "Development of KOMPAK Network as a sustainable forum for information exchange and collaboration on urban disaster mitigation activities: Membership maintenance and expansion, workshop/seminar, communication and information dissemination through newsletter, web site and publication of special documents"

Objective:

- Maintain and expand the membership within KOMPAK networking scheme, by maintaining information exchange and conducting collaborative activities with various KOMPAK members.
- Maintain and upgrade the web site/homepage of KOMPAK, which will provide a media for information exchange and dissemination within KOMPAK as well as with others networks and organization.

Scope of Work:

- Establish project newsletter, and further KOMPAK newsletter, in the web site as well as hardcopy form for distribution to KOMPAK members and

interested parties.
- Consolidation and expansion of the network membership directory.
- Maintain regular contact with KOMPAK members as well as promoting collaborative works between various members for urban disaster mitigation related activities.
- Maintain and upgrade of KOMPAK web site as a platform for information exchange within the network as well as with other interested parties.

Implementation:

Actually, the activity was a continuation program of Activity 1 and 2 from Phase I, with the main program to maintain the network and expand the members of network. Maintenance was made by in depth development of relationship among the members, and uploading new information on the progress of project and other information. Listing the results on earthquake mitigation initiatives conducted under IUDMP and other related project such as RADIUS Project and UNESCO Project was carried out.

A videoconference session between members of IUDMP Working Group in Bandung and the participants of 24th Disaster Mitigation Course in AIT Bangkok was held on March 19, 1999. Response of the participants was felt as positive.

A general discussion regarding Risk Mitigation was conducted around October 1999 by using Internet technology (IT forum). The response of participants is encouraging.

To expand the information of earthquake mitigation initiatives, the KOMPAK Homepage was reconstructed and the web site was moved to a new server, the address being the same, http://www.kompak.or.id.

Output (Product):

- KOMPAK network established, accepted and recognized nationally as well as internationally as a national networking between various organization and individuals working on various aspects of urban disaster mitigation.

Involved Organization:

- IUDMP
- EERG – ITB
- Puslitbang Geologi – Dept. Pertambangan dan Energi (GRDC)
- Municipality of Bandung (BAPPEDA, City Planning Office & Building Office)
- BAKORNAS PB

Activity N2: "Preparation of guidelines and information of mitigation measures in building planning, design and construction for general public use, and dissemination of the product"

Objective:

- To produce simple guidelines/documents which provide information to help the community in planning, design and constructing inexpensive earthquake resistant building in the City of Bandung.
- To disseminate the guidelines among some targeted community groups.

Scope of Work:

- Collect available information and guidelines for earthquake resistant building in Indonesia.
- Prepare simple, user friendly, small booklets describing things to be considered to plan, design and construct an earthquake resistant low cost residential building/house, taking into account the local condition of Bandung seismic vulnerability.
- Arrangement of a dissemination method in conjunction with the building permits process of the Municipal Building Control Office.

Implementation:

The activity was completed by end of February 2000, focusing on developing simple technical guideline on building planning, design and construction for public use.

Carried out activities described bellow:

1. Conduct a series of meetings with project participants, for:
   - Team building process
   - Gaining mutual understanding on the approach for the project
   - Developing scope of works, methodology and time schedule
   - Inventory of available data and information
   - Monitoring progress achieved and problem encountered

2. Collection of existing information materials on low cost seismic resistance building using local technology and materials, such as manual, leaflet and guidelines and books.

3. Intensive discussions with several resource persons on the technology of building construction and retrofit.

4. Conduct field survey in 4 (four) sub-districts, i.e. Bojongloa Kaler, Ranca Sari, Ujung Berung and Bandung Kulon.

5. Prepare and develop, guidelines on building construction and material for dissemination to general public use based on the survey result.

6. Conduct several discussions to improve the guideline and how to disseminate the guideline with Building Control Department and other resource persons.

7. Reproduce and disseminate the guideline through the City Building Control Department.

Output (Product):

- Leaflets on constructing the earthquake resistant simple housing with wood, concrete and masonry materials for public use.
- Booklet on planning and constructing an earthquake resistant simple housing for public used.

Involved Organization:

- Puslitbang Permukiman – Center for Research and Development of Human Settlement, Ministry of Regional Development and Human Settlement
- DTK - City Planning Department of Bandung
- DPB – Building Department of Bandung

Activity IEC1: "Disaster public awareness campaign by educational broadcast through public electronic media (TV/Radio)"

Objective:

- To prepare an educational broadcast program on disaster preparedness aimed at the common people audience.

Scope of Work:

- Define TOR for the program, together with the local broadcast media.
- Define information to be disseminated to the public.
- Develop format of the broadcast program.
- Record and air of the broadcast program.

Implementation:

The activity had been completed by end of January 2000. The public education campaign was conducted through the radio media with local broadcast station, Radio RASE FM in Bandung. Some articles from local journalist, Ms. Ida Farida, especially on seismic hazard and its impact to Bandung area were published at the local daily newspaper, HU Pikiran Rakyat.

The carried out activities follow:

1. Develop the framework and term of reference.

2. Develop the draft of education campaign programs and materials.

3. Conduct survey of public media to be used to disseminate the education program on disaster preparedness. Cost aspect, technology and effectiveness of each public media were compared.

4. Contact and negotiate with public media to be involved in this activity, i.e. radio station and newspaper company.

5. Invite selected public media on the Disaster Journalist Training to improve the awareness, attention and sense of disaster mitigation.

6. Coordination meeting with selected public media for development of program scenario and program design.

7. Develop and improve the broadcast program in collaboration with the selected radio station.

8. Conduct a series of public education campaign activities through public media, in 3rd and 4th week of November 1999 in collaboration with RASE FM Radio. The activities included follow:

   - A series of Talk Show (3 times) which focus on earthquake phenomena, the vulnerability and earthquake risk faced by the City of Bandung, and the preparedness action that should be taken and have been done by the City of Bandung and the general public.
   - A series of EQ Quiz (10 times) conducted in two weeks in a row.
   - Inserts about 40 times conducted in two weeks in a row. Insert is a kind of public service advertisement.

9. Analyze the public response to the disaster public awareness campaign programs after the implementation of the program, and prepare activity report.

Output (Product):

- A recorded broadcast program, i.e. quiz, public advertisement (insert) and talk show, aimed at informing basic disaster awareness and preparedness for the common people audience.

Involved Organization:

- Radio Rase FM
- H.U. Pikiran Rakyat (Local newspaper)
- BAPPEDA Kota Bandung
- EERG
- Puslitbang Geologi – Dept. Pertambangan dan Energi (GRDC)

Activity IEC2: "Support the establishment of Center on Disaster Mitigation and Prevention Research (CDMP) in ITB, which will continue the networking scheme after the end of the Project"

Objective:

- To help establishing a Center for Research on Disaster Mitigation and Prevention in ITB, which will function as a national research center promoting scientific approach to disaster mitigation and prevention in Indonesia.

Scope of Work:

- Provided input to the organizational development of the center.

Implementation:

The proposed Center for Research on Disaster Mitigation and Prevention in ITB had been discussed with several relevant organizations Proposal for the establishment of the center had been submitted to the Institute for Research and to ITB and actions were taken to materialize it.

Due to the recent strategic changes in structure and organization of ITB, which moved toward privatization starting in year 2000, the official process for establishment of new centers within ITB is suspended, and no strategic decisions are made in the Institute pending for the final structure.

Output (Product):

- Center for Research on Disaster Mitigation & Prevention (unofficially) recognized in ITB.

Involved Organization:

- LP-ITB
- BAKORNAS PB
- IUDMP

Activity IEC3: "Consultancy for CDMP-ITB for strategic planning and organization"

Objective:

- To provide outside consultancy input to the Center for Disaster Mitigation and Prevention, on the strategic direction for the centers organizational development

Scope of Work:

- Conducted SWOT analysis
- Formulated strategic plan for the organization
- Formulated mid term plan

Implementation:

Due to the uncertainty of the final format of ITB organization, this activity has not been implemented.

Involved Organization:

- IUDMP

Activity IEC4: "Public education campaign for earthquake hazard awareness: pilot project focused on selected schools"

Objective:

- To develop a suitable method for earthquake hazard awareness campaign at the school children level

Scope of Work:

- Collect available campaign material
- Select several pilot project schools for testing
- Implement special classes and awareness day at selected schools
- Assessment of awareness improvement
- Formulation of improvement for the campaign material

Implementation:

The activity had been completed by end of January 2000 and the final report has been submitted.

Implementation stages follow:

1. Conduct preliminary investigation of pilot project schools to select and prepare campaign material at the first stage. Secondary data pertaining to 5 elementary schools and 5 secondary schools were obtained from Dinas P & K (Education and Cultural Department). This activity was conducted in collaboration with School Safety Project from UNESCO, carried out by BAPPEDA and Dinas P & K.

2. Conduct field survey for selected schools to get more detailed information on the level of vulnerability and capacity of each school. Based on this survey and data obtained from Dinas P & K, 2 (two) elementary schools were selected for pilot project, i.e. SD Sabang and SD Tikukur. During the field survey, it was found that there were schools that have higher seismic risk but could not be used as pilot project due to its high student density and bad physical condition as well as school site lay out.

3. Prepare and develop the education campaign materials. The prototype of material for education campaign was produced under the collaboration with the UNESCO Project, i.e. poster, leaflet and booklet.

4. Conduct coordination meeting and discussion with Dinas P & K and selected schools to discuss the implementation of IEC4 program. It was agreed to conduct a one-day workshop to implement the education program to school

children.

5. Conduct one-day workshop on "Earthquake Education Campaign for School Children" on November 16, 1999 in East Auditorium ITB. 104 elementary school children and 15 teachers and principals from selected school (SD Sabang, SD Tikukur I, II, III, IV, V and VI), 100 invitees from school representative of 26 sub-districts of Bandung City, scouts, international schools and journalist participated in the workshop. Total participants about 220. The workshop covered presentation pertaining to seismic phenomena, emergency preparedness, and discussion and exercises. Response from school children and participants was very positive. The school children were very interested by the presentation and simulation of earthquake phenomena and its impact.

6. Conduct an earthquake drill and some related activities, such as earthquake ABC drawing, earthquake ABC games, etc., in Earthquake Safety Day on December 4, 1999 on one of selected pilot project schools, i.e. SDN Tikukur I, II, III, IV and V. The school children, teachers and principals participated in the program enthusiastically.

7. Produce the picture dictionary on earthquake drawn by the school children in the Earthquake Safety Day at the final stage and report of activity.

Output (Product):

- Earthquake picture dictionary, drawn by school children
- Poster, leaflet and booklet on earthquake
- Video cassette on workshop and earthquake drill activities

Involved Organization:

- EERG– ITB
- Kanwil Pendidikan Nasional (Regional Office of National Education)
- Dinas Diknas Kota Bandung (Local Office of National Education)
- Municipality of Bandung (BAPPEDA, DPB, DTK, SATLAK PB, etc.)
- UNESCO
- Puslitbang Geologi – Dept. Pertambangan dan Energi (GRDC)

6.5 Training Component

Activities under the Training component follow:

Under IUDMP Phase I

Activity 1: "Identify the National Partner Training Institution (NPTI) for national UDM training implementation"

Objective:

- Identify and select eligible NPTI as the partner for institutionalizing national UDM training program

Scope of Work:

- Identification of potential National Partner Training Institution (NPTI), together with ADPC
- Establishment of collaboration with the selected NPTI (through ADPC)
- Identification of training needs (both demonstration project related and long-term needs) and target participants.
- Supported ADPC and NPTI activities in institutionalizing sustainable training program

Implementation:

The activity was focused on identifying the potential national institutions for NPTI, and invite for their interest. They are:

- Pusat Pendidikan dan Latihan (PUSDIKLAT – Training and Education Center) of the Ministry of Public Works
- Badan Pendidikan dan Latihan (BADIKLAT – Training and Education Agency) of the Ministry of Home Affairs
- Lembaga Pengabdian Kepada Masyarakat (Institute for Community Services and Development) of Institut Teknologi Bandung
- Pusat Penelitian dan Pengembangan Pemukiman (Regional Center for Human Settlement) of the Ministry of Public Works

Output (Product):

- Identification of national institutions for the NPTI

Involved Organization:

- LPM ITB
- BADIKLAT DEPDAGRI
- PUSDIKLAT PU
- PUSKIM
- IUDMP
- Learning & Professional Development Unit of ADPC

Under IUDMP Phase II

Activity T1: "Support NPTI establishment and implementation of 1st national training, with target 1 training for 25 participants from various interest groups: local government officials, professionals NGOs, journalist, and other interest groups"

Objective:

- To conduct a pilot disaster mitigation training (Training for Trainer) by selected NPTI

Scope of Work:

- Selection of candidates
- Preparation of course material based on selected core curriculum syllabus
- Implementation of training

Implementation:

From 3 to 4 February 1999, Mr. Aloysius J. Rego and Ms. Ramana G. Barathy visited Jakarta and Bandung to follow up the NPTI selection process. Accompanied by IUDMP Project Manager, discussions with the three NPTI candidates, i.e. BADIKLAT (Ministry of Home Affairs), Institute for Community Services (ITB) and Institute for Research and Development on Human Settlement (PUSKIM) were conducted to obtain more clarifications on their proposal.

Two National Partner Training Institutions (NPTI) had been selected, i.e. Institute for Community Services ITB (LPM ITB) and BADIKLAT Ministry of Home Affairs (Education and Training Agency), which were required to collaborate. Some coordination meetings between LPM ITB and BADIKLAT were conducted, including the one conducted on 13 - 14 November 1999 in Bandung, which was attended by Mr. Aloysius J. Rego from ADPC. The objective of this meeting was to discuss the collaboration between LPM ITB and BADIKLAT to implement the National Training Program.

A training-planning meeting was conducted on June 14, 2000 with BADIKLAT in Jakarta, attended by Ms. Zenaida G. Delica, Director of Training and Education ADPC, and Mr. Mohezin Tejani. A similar meeting with LPM ITB was conducted on June 16, 2000 in Bandung. The objective of the meetings was to coordinate emerging issues in the collaboration framework. Each NPTI is then encouraged to submit a proposal independently on the training plan. Up to now, the proposal for this activity is being evaluated.

However, as there were still many uncertainties regarding the available funding and in particular the future sustainability of the program, the implementation of the training was suspended, subject to clarification of its objective.

Output (Product):

- Institutionalized training program

Involved Organization:

- NPTI
- Project Management Unit (PMU)
- International Consultancies Management Unit of ADPC

Activity AT1: "Disaster Journalist Training"

Objective:

- To improve the capability of local journalists in writing disaster related articles and reporting

Scope of Work:

- Preparation of training material and instructors
- Selection/invitation for interested journalist participants
- Implementation of training workshop for selected journalist participants

Implementation:

The IUDMP collaborated with the local newspaper company, HU Pikiran Rakyat, in conducting the Disaster Journalist Training on September 10 to 12, 1999. 25 participants from newspaper and electronic media (radio and television) attended the training. Participants came from various places in Java Island. Mr. Aloysius J. Rego, Mr. Rajesh Sharma (both of them from ADPC), and Mr. Sriram Singh Basnet from Nepal provided input in the training as instructor.

The objective of this training follows:

- To improve the understanding of journalist and news editors on the various aspects of disaster management, in particular prevention and mitigation, in order to improve their capacity in disseminating disaster information.
- To develop a network or forum for discussion between journalist and expert and among themselves.

The response from participants is very encouraging and they hoped that this training could be conducted again in other cities with further topics.

After the end of this training, an Essay Competition on Earthquake and Its Safety and Emergency Response among journalist was conducted to follow up the result of training. A report of training implementation was prepared and developed, and some input to improve the implementation of training on technical and non-technical side of the training were included.

Output (Product):

- Improved capability of local journalists in writing disaster related articles

Involved Organization:

- H.U. Pikiran Rakyat (Local Newspaper Company)
- Project Management Unit (PMU)

Activity AT2: "Training for Building Control Department Staffs on Building Monitoring Control System"

Objective:

- To improve the capability of Building Control Department (DPB) Staffs in conducting building monitoring in the city for an improved seismic safety

Scope of Work:

- Design the training workshop for the DPB staffs, including training materials, instructors etc
- Conduct the training workshop for staffs working on building monitoring and control in the city

Implementation:

Parallel with the development and implementation of building monitoring system at the final stage, the program and material for training on "Implementation of Building Monitoring System for the Municipality of Bandung" was prepared and developed.

The training was conducted from 6 to 8 December 1999 by IUDMP Working Group under the coordination of Building Control Department. This training was inaugurated by the Secretary of the Municipality of Bandung, Mr. Diding Kurniadi and 45 staffs (mostly field inspectors) from Building Control Department were participating. The objective of this training was to improve their comprehension toward building regulation and improving technical capability in implementing the monitoring system of building at planning and construction stage. Various planning, design and monitoring aspects of earthquake resistant building were discussed in this training.

The report of this training program includes input on how to improve the comprehension and capability of Building Control Department staffs and the implementation of future training sessions. The improved training module and materials for conducting future training was also developed.

Output (Product):

- Trained staffs which work for an improved building monitoring system in the DPB

Involved Organization:

- Inter University Center – Laboratory of Mechanic ITB
- Dinas Pengawasan Bangunan (DPB) - Kotamadya Bandung

7.0 Result Achieved

7.1 Demonstration Project Component

Project result achieved by activities under the Demonstration Project component follows:

Under IUDMP Phase I

Activity 1: "Risk Assessment: Hazard Assessment and Vulnerability Assessment"

General Assessment:

The demonstration project activities in Phase I had completed the risk assessment and risk mapping of Bandung, by identifying seismic source zones, assessing seismic hazards and its secondary hazards, assessing the overall risk of the city by combining the hazards, its exposure and vulnerability to disaster, external context and its capability of emergency response and recovery.

In the hazard assessment process, the city seismic hazard analysis was conducted based on available data which can be collected, i.e. geological condition of Bandung Area, soil condition of Bandung Basin, seismic source zones around Bandung Area that potentially can cause an earthquake, the earthquake historical data and mechanism, and other related information.

At the end of the hazard assessment process, several hazard maps were produced, i.e.

- Ground Surface Acceleration Map (in g for 200 years return period)
- Earthquake Intensity Map (in MMI Scale for 200 years return period)
- Landslide Susceptibility Map
- Liquefaction Potential Map

The vulnerability assessment process include data collecting on population distribution and density, city infrastructures, land use planning, and other related information. The process of seismic vulnerability assessment is by weighting and superimposing the physical, socio-economic and physical vulnerability to produce a vulnerability map of Bandung on a regional scale. At the end of the process, several maps on vulnerability of the City were produced during this process, i.e.

- Building density map
- Population density map
- Residential building density map
- City's infrastructures maps
- Social and public facilities maps

By combining the hazard and the vulnerability, the risk faced by the City of Bandung was accounted. The result of the risk assessment shows that there are higher risks exposure to disaster due to earthquake in the south part of the Greater Bandung than in the northern part, due to its soil and geological condition on one side and the socio-economic vulnerability on the other side. The soft soil condition and the larger depth of bedrock in the southern part are responsible for the higher amplification factors, compared to those of the northern part of

Bandung. On the other side, some risks of landslide during earthquake tremor can observed in some parts of north Bandung.

Activity 2: "Development of Mitigation Strategies and Action Plan"

General Assessment:

The risk faced by the City of Bandung, presented as estimated potential damage which could happen in case of an earthquake event was presented in one-day strategic workshop held on 4 April 1998, in Lembang Bandung, with the objective to collect input for the formulation of earthquake mitigation strategy in Bandung as well as input for preparing an action plan for implementing the strategy. The output of city-wide damage scenario study is used as input to stimulate participants in developing ideas and initiatives for seismic hazard mitigation discussions.

In this workshop, issues regarding seismic risk mitigation, awareness and preparedness in Bandung area were discussed. The objective of the discussion was to find ways to improve the city urban planning and building regulation environment, emergency preparedness and awareness at the local level. Based on the result of this workshop, a set of mitigation strategy and an action plan for its implementation had been developed and recommended to the local government decision-makers at the end of Phase I.

The recommended mitigation strategy covered the following:

1. To evaluate the current Bandung Spatial Planning (RUTR) taking into consideration the seismicity of Bandung, and to enhance the effectiveness of the land use control, with different emphasis between built up area and where development is in progress, and to disseminate the result to the public.

2. To improve the local building regulation, by taking IUDMP results into consideration, and in the same time to improve the institutional capacity of agencies involved in the building regulation and control process, and to disseminate information on the building regulation to the public.

3. To improve the capacity of the local disaster management unit, through institutional strengthening of the organization and its procedures, and its improved collaboration and coordination with other emergency response authorities in the city, and to involve the public participation by raising awareness among the public.

The associated action plan for strategy No.1 is to:

Short term:

1. Evaluate and improve the current city spatial plan (RUTRK), taking into consideration the seismicity of Bandung, as demonstrated by IUDMP, in the fiscal year 1998/1999.
2. Preparation of an integrated disaster map (1999/2000).
3. Dissemination of disaster vulnerability information (1999/2000).
4. Mapping of location of and access for disaster evacuation (1999/2000).

Long Term:

1. Review of the 1991-2005 Long Term Spatial Plan, by integrating disaster mitigation approach in the process.
2. Law enforcement of the reviewed Spatial Planning.

The associated action plan for strategy No. 2 is to:

1. Review and improve the newly adopted local building regulation, by taking into consideration of the IUDMP results, in the fiscal year 1998/1999.
2. Review and improve the current monitoring and control information system in the Building Control Department, including restructuring the building stock database, to provide better information for mitigation purposes, in 1999/2000.
3. Review and developing institutional arrangement for better building control in the urban development process, in 2000/2001.
4. Dissemination of guidelines and information of mitigation measures in building planning, design and construction, in simple, communicative forms, such as leaflets, brochures, monographs etc., to the public, in the current fiscal year.

The associated action plan for strategy No. 3 is to:

1. Review and improve the city standard procedure for disaster management, in the fiscal year 1998/1999.
2. Training of the City's Disaster Management Unit (SATLAK) personnel for improved procedure, including coordination drills with other agencies, in 1999/2000.
3. Training and orientation for special public groups, such as school principals, journalist, NGO, etc, in 1999/2000.
4. Dissemination of disaster management related information to the public for awareness raising and preparedness, in 1999/2000.

From the proposed action plan, several activities had been selected to be implement as part of IUDMP Phase II.

However, at the city government side, there were no committed projects allocated

to implement the proposed strategy, due to unavailability of city funds. In addition, the transition period induced by major economical and political changes in the country since 1998 raised a lot of uncertainties and the city government was also required to address to ore pressing issues such as sudden increase in unemployment and the major reduction in available budget for infrastructure program. In general, aside from IUDMP funded activities, there were no action taken for implementing the proposed strategy by the city.

Activity D1: "Review of Bandung Spatial Planning with regard to seismic safety, and preparation of technical guideline for implementation by the Municipal Urban Planning Office"

General Assessment:

The City of Bandung had developed the General City Spatial Plan (Rencana Umum Tata Ruang Kota – RUTRK). The current general spatial plan, RUTRK 1993 - 2003, did not specifically consider the seismic hazard aspect, although the spatial plan could be used as a tool for disaster mitigation. The activity D1 was an in depth study and analysis implementing the result of risk assessment conducted in Phase I to the urban spatial planning process.

The process for reviewing the city RUTRK includes the selection of the sub-district (area) with highest seismic risk for case study in developing input to the City on how to improve and to refine the Detailed Spatial Plan (Rencana Detil Tata Ruang Kota – RDTRK). The process of reviewing and improving the RUTRK and RDTRK then was rewritten into a technical guideline format that could be used by the Local Government to replicate the process for other RDTRK.

Problems faced during the implementation of this study were lack of data and information to measure the selected risk indicator, and the availability of thematic map.

The result of this study, which was proposed to the City Government, could be used as an input to review and improve the existing spatial planning process as well as for issuing the building permit for seismic prone areas. By conducting this study, the physical development of Bandung City could be redirected, taking into account the seismic hazard. It was felt then at the end of the study that seismic hazard was an important factor to be considered in the spatial plan development.

Activity D2: "Review of Bandung Local Building Regulation with regard to seismic safety, and preparation of technical guideline for implementation by the Municipal Building Control Office"

General Assessment:

Historically, the City of Bandung has never experienced a devastating

earthquake, although two or three strong tremor could be felt every year. Due to the lack of guidance and control during the planning and the implementation of urban development, many public infrastructures as well as private buildings were constructed without respect to earthquake mitigation practice and code. Infrastructure and lifelines are prone to be cut out of service during such emergency event. Critical facilities such as hospitals, health centers and public schools were often built with limited budget and tend to ignore earthquake resistant quality. Construction due to urbanization expands uncontrollably into highly sloped adjacent areas and risk of earthquake-triggered landslides is increasing dangerously.

The current building regulation used by the City of Bandung, Municipality Regulation No. 14 /1998 on Building in the Municipality of Bandung Area, was issued by the local parliament on April 15, 1998. In this building regulation, the seismic hazard aspect on building planning, design and construction was included very rudimentary.

As a result of intensive discussion and reviewing the building regulations, it was concluded that the regulation needed more input on seismic provision. At the end of this study, a technical guideline containing stipulations pertaining to seismic risk mitigation for implementing the local building regulation was prepared.

During the implementation of this study, problems faced are the capacity of the Bandung local government staffs, in particular Local Building Office staffs, to understand and implement the result of the study, due to insufficient educational background.

By conducting this study, the awareness of the Local Building Office staffs on the seismic hazard aspect was improved, and it motivate the Local Building Office staffs to learn more about earthquake resistant buildings.

Activity D3: "Development and implementation of building monitoring system for the Municipal Control Office"

General Assessment:

This study has produced a document on the control process of planning, designing, construction and operation/use of buildings in the city of Bandung.

The document described the issues related to stages in the provision process of buildings, involved organizations, control and inspection, and building categories. It also reviewed the existing monitoring and control process of building construction in the city.

Based on the review, a concept for controlling the process provision of new buildings and for monitoring of existing buildings had been proposed. A structure

of database used for monitoring existing buildings, based on the function, year of construction, number of stories, structural types and building material, occupant density, soil condition and other site specific information was proposed for the purpose of assessing the vulnerability of building stocks against various hazards, in particular seismic hazard.

Based on the recommendation, the city (in this case the Building Department) is expected to be able to develop a better mechanism to control the construction activities in the city and to collect information required to assess the vulnerability of its building stocks. With this kind of information, the city can formulate a strategic action plan to reduce the vulnerability of its building stocks against earthquake.

As the Building Office was involved in the review process, it was felt that the learning process itself has been very useful to them, because it provided an opportunity to have a deep insight into the current issues they used to face in exercising their routine jobs of issuing building permit, inspecting sites and issuing demolition order etc..

However, it is up to the city to take follow up action of this initiative, without which the document will not be very useful for the city.

Activity D4: "Multi hazard activity: Risk assessment and mitigation measures for La Nina related disaster in Bandung Basin"

General Assessment:

In the Phase II, the demonstration project component has shifted from single hazard to multi hazard mitigation, by exercising activities directed at increasing public awareness to flood hazard in the city and the mitigation of its impact.

The impact of La Nina phenomena could increase the rainfall intensity in Indonesia and in turn could increase flood risks. The study of La Nina phenomena was performed and its effect to the City of Bandung and the Regency of Bandung was predicted. It was estimated that the flooded area in the city will increase, compared to the usual annual flood pattern.

Although the expected rainfall intensity did not happen and hence no increased flood area, the awareness of the local community was improved resulting into better preparedness and more motivated local community groups. From the local government side, better coordination between organizations was achieved in preparing for the future floods. The experience showed that there are many NGOs willing to contribute to improve the community preparedness, provided that they are given adequate and correct information.

However, the early warning system recommendation was never implemented as

there was no clear sign who will be responsible for operating the system.

7.2 Policy Input Component

Activities achievement under the Policy Input component follows:

Under IUDMP Phase I

Activity 1: "Analysis of Existing National Policy on Disaster Mitigation"

General Assessment:
The evaluation and identification of the existing system in the Indonesian Disaster Management, with the City of Bandung as a specific case, identified the strengths and the weaknesses of the system, in particular some issues related to the coordination and participation of various involved organizations and stakeholders, and its relation with the process of regional and urban planning. An emphasis on earthquake disaster mitigation as an example had been followed.

The analysis included the identification of the institutions, legislation products and guidelines, and the national policy statement on disaster management in the current 5-years development plan. The identified strengths included the adoption of the complete disaster management cycle in the disaster management strategy. It was found that on the implementation side, most disaster management organizations were more concerned with the emergency response and recovery stage rather than with the other stages. The stated policy and program on disaster management has not been fully adopted due to the inadequate commitment building process from the stakeholders.

Activity 2: "Workshop on National Disaster Mitigation Policy"

General Assessment:
The workshop had produced recommendations for reviewing the system and policy in national and local disaster management institutions:

- Evaluation of the effectiveness of the existing natural disaster management system.
- Establishment of Indonesian Disaster Management Center that continuously, systematically and scientifically develop the policy and tools for natural disaster management in Indonesia in a holistic way which cover the whole disaster management cycle.
- Human resources development among the related department.
- Development of coordination system for disaster management at national, regional and local level.
- Development of an integrated information system for natural disaster

mitigation.

Activity P1: "Improvement of Standard Operating Procedure (SOP) in the local DM unit (SATLAK PB Bandung), and support for local Emergency Operation Center establishment (RUPUSDALOP PB)"

General Assessment:

The improved Disaster Management Standard Operating Procedure for SATLAK PB has been distributed to its member. The document has been developed with the active participation of the members, which in turn are expected to be more aware of the preparedness issues.

Related to the establishment of the local Emergency Operation Center (RUPUSDALOP PB) a set of document consisting of *EOC Development Plan*, *SOP*, and *Workbook,* has been developed and submitted to the city for review and follow up actions.

It was expected that the city took the following actions:

- Review the working draft, and make changes as appropriate. In particular, in the *Development Plan*, overall priorities for needed equipment need to be determined and possible local sources and/or contributors should be identified.
- Obtain the approval of the Mayor (and other officials, as appropriate) for the Development Plan.
- Request the Mayor to instruct all appropriate departments to designate a primary and back-up staff person for assignment to the RUPUSDALOP PB during mobilization.
- Designate an appropriate SATLAK PB member to be responsible for organizing and conducting simple training and drills of designated RUPUSDALOP PB staff.
- Create a small task force of SATLAK PB members to pay a call on appropriate local industries, business, and governmental, non-governmental, and international agencies to seek commitments to contribute toward funding or direct provision of priority equipment and/or supplies. This commitment may be in the form of a commitment to match contributions by others.
- Prepare, with assistance of IUDMP or others as appropriate, formal or informal grant requests, based on the RUPUSDALOP PB Development Plan, the priority needs, and the commitments of local organizations, agencies, business and industries to contribute toward the overall funding needs. These grant requests can be directed to Bandung's sister cities, international agencies such as the Asian Development Bank, and national agencies such as JICA (Japan) and the U.S. and Australian aid agencies.
- Continue to build the operational capacity of the RUPUSDALOP PB through simple drills and exercises and use of borrowed equipment, while pursuing

acquisition of equipment and supplies from a variety of sources.

However, the city is currently in a turbulent transition period due to the decentralization process, resulting to many uncertainties in the structure of local government organizations as well as changes in personnel. The follow up process for developing the EOC (RUPUSDALOP PB) has been left behind by the city, as they have other priorities in their agenda.

Activity P2: "SOP socialization workshop for SATLAK PB members, and preparation of socialization materials"

General Assessment:
The workshop had achieved in general a two-fold objective i.e. firstly to invite participatory input from the members in improving the SOP and secondly to socialize the content of the SOP in order to make them understand of their own responsibility in disaster management.

Activity P3: "Preparation of City Operational Emergency Plan for Earthquake (City Emergency Response Plan for Earthquake), and Workshop on City Operational Emergency Plan"

General Assessment:
During the workshop conducted in the process, it was agreed that the City Emergency Operational Plan for Earthquake would be adopted as a Technical Guideline on Earthquake by SATLAK PB. The process was participatory in nature as it involved all the SATLAK members to provide input for the document and at the same time it has improved their seismic hazard awareness.

A socialization session with the local community at the city sub-district level (Kecamatan) has been conducted in Kecamatan Bojongloa, one of the kecamatan with highest seismic risk. The session was conducted in collaboration with the city's Fire Department.

Activity P4: "Workshop on Preparation of Action Plan for Urban Seismic Disaster Mitigation" (collaboration with RADIUS Project)

General Assessment:
The workshop gave an example on the participatory approach in preparing a risk mitigation plan and in general it was successful in term of involved participants and also in term of supporting organizations (AUDMP and UN-IDNDR RADIUS Project). The workshop produced valuable input and recommendations which then incorporated in the Bandung Seismic Risk Mitigation Plan document which was later produced with the support of the RADIUS Project.

Activity P5: "Development of National Policy for Urban Disaster Mitigation"

General Assessment:
Problem found is similar to what happened in Bandung, disaster mitigation in urban areas was not in the first priority list for national institutions such as BAKORNAS PB, as they were faced with many emergency situations in the country due to the political transitions and socio-economic changes inducing so many social unrest and civil strife in some parts of Indonesia. The government has been faced continuously with the consequences of social unrest, such as internally displaced persons and the damage of many public facilities and infrastructures.

The study provided a draft document on the strategy that could be adopted by the national institutions in disaster management and also by local governments in the country for mitigating urban disasters. The draft was then submitted to BAKORNAS PB as an input in formulating a national UDM strategy and as part of the process, the draft is then discussed with all the members of BAKORNAS PB in the National Policy Workshop (AP1)

Activity AP1: "Workshop on National Policy and Lessons Learned Workshop"

General Assessment:
In the workshop, it was concluded that, in general, the proposed policy was accepted by the participants, subject to some further refinement and fine-tuning, for further adoption as a national general policy on urban disaster mitigation, while acknowledging local government autonomy paradigm for the detailed implementation of the strategy. It was also accepted that the policy should address all types of hazard and not limited to only earthquake, as it was implying in the beginning.

It was also agreed that this workshop would be followed-up by further actions from the relevant parties, leading to the institutionalization of the policy into a legal product (Ministerial Decree), after deliberation by relevant Working Groups in the BAKORNAS and further review by related ministries.

7.3 Networking, Information and Education Campaign Component

Activities achievement under the Networking, and Information and Education Campaign component follows:

Under IUDMP Phase 1

Activity 1: "Development and Establishment of Network System for Information Exchange And Dissemination"

General Assessment:
A networking scheme, namely KOMPAK, was established as a platform for communication and discussion on the project activities and other related urban disaster mitigation initiatives among the project stakeholders and interest community group. It consisted of grouping of various organizations and institutions and individuals interested in urban disaster mitigation and preparedness issues, practicing professionals as well as academicians.

The IUDMP Newsletter was produced under this activity as a bimonthly bulletin of the project to disseminate the information of project activities and result and other related information on urban disaster mitigation to the project stakeholders.

It is recommended that a sustainable organization should be set up to continue and maintain the networking scheme after the end of the Project. It is envisaged that the Center for Research in Disaster Prevention and Mitigation in ITB, which is now still in its embryonic stage, continues the development and maintenance of the scheme.

Activity 2: "Develop Homepage for Information Exchange and Dissemination"

General Assessment:
To disseminate the project activities and result to the public, a website homepage (http://www.kompak.or.id) was established. The project findings and other related information on urban disaster mitigation initiatives was uploaded in this homepage.

Due to lack of promotion and socialization of the KOMPAK website, only a few people interested in disaster mitigation accessed and use the KOMPAK homepage to find the information they need.

Under IUDMP Phase 2

Activity N1: "Development of KOMPAK Network as a sustainable forum for information exchange and collaboration on urban disaster mitigation activities: Membership maintenance and expansion, workshop/seminar, communication and information dissemination through newsletter, web site and publication of special documents"

General Assessment:
This activity is basically a continuation of Activity 2 under IUDMP Phase 2. It was

felt that the underutilization of the website was due to the limitedness of the amount of information and available facilities provided by the site, as well as the technical problem from the website server provider. This activity is then tried to alleviate the problem by reconstructing the whole site and migrating it to a new server provider, beside uploading more information in it.

Information dissemination is in most cases done through conducting workshops and active participation in various events or meetings, where information on IUDMP are exchanged by presentations and poster exhibitions. Documents related to IUDMP are distributed in those events. New contacts were made with organizations and individuals who are interested to expand their networks. New collaborative projects in disaster mitigation were established, such as the Urban Community Based Flood Mitigation Project with ADRC, Kobe, and participation in the EQTAP (Earthquake and Tsunami Mitigation for Asia Pacific) project under EDM-RIKEN, Kobe, Japan.

Activity N2: "Preparation of guidelines and information of mitigation measures in building planning, design and construction for general public use, and dissemination of guidelines and information that produced"

General Assessment:
For general public use, the team developed and produced guidelines on building planning, design and construction of earthquake resistant non-engineered building, in the form of leaflet and booklet:

- Leaflet on "Dasar Perencanaan Bangunan Rumah Tinggal Sederhana Tahan Gempa" (Basic Planning of Earthquake Resistant Simple Housing)
- Leaflet on "Bangunan Tembok dengan Kolom Pilaster Tahan Gempa" (Earthquake Resistant Masonry Building with Masonry Column)
- Leaflet on "Bangunan Tembok dengan Kolom Kayu" (Masonry Building with Wooden Column)
- Leaflet on "Bangunan Tembok dengan Kolom Beton" (Masonry Building with Reinforced Concrete Column)
- Booklet on "Petunjuk Dasar Perencanaan Bangunan Sederhana Tahan Gempa" (Basic Guideline for Planning and Design of Earthquake Resistantt Non-Engineered Building)

It was hoped, by disseminating the information, the knowledge of community on how to build and construct the earthquake non-engineered housing would be improved. In general, these documents were distributed in various events/meetings and they were particularly in high demand at many earthquake stricken areas recently visited by the IUDMP team, such as Bengkulu, Sukabumi and Pandeglang. The Ministry of Human Settlement reproduced the document in high quantity for distribution at the needing places, with the consent of IUDMP Team.

Activity IEC1: "Disaster Public Awareness Campaign by Educational Broadcast Through Public Electronic Media (TV/Radio)"

General Assessment:
The activity produced a good example on how to conduct earthquake public awareness campaign through broadcast media (FM Radio). Based on the experience, some input to improve the public awareness on disaster were recommended to the City Government. It was hoped that the City Government could continue the public education campaign after the project was completed, using the example given by the experience, with the main objective to improve the public awareness and preparedness, and thus minimizing the earthquake risk.

Activity IEC2: "Support the establishment of Center on Disaster Mitigation and Prevention Research (CDMP) in ITB, which will continue the networking scheme after the end of the Project"

General Assessment:
The concept behind this activity is to provide an official platform where all research activities related to disaster mitigation and prevention can be generated and synchronized with a more formal research based education program. The vision of the center is to become a national center promoting scientific approach to disaster mitigation and prevention works in the country, and one of the most active and leading centers promoting mitigation culture at the regional level, as part of the international network. Al the networking scheme developed by the project can then be maintained and developed by the proposed Center.

In principle, the existence of the Center has been (unofficially) recognized by the Institute, as it is often asked to provide input to various disaster management tasks carried out by the Institute, such as field surveys to disaster stricken areas and attending various official functions conducted by the national as well as local government

However, due to the structural changes faced by the Institute as it started to move into privatization, the official establishment process was getting slowdown, as no strategic decision is now taken by the Institute, pending to the finalization of the new University statute in September 2001. It is expected that the official establishment of the Center can be realized within the period of IUDMP Phase 3 implementation.

Activity IEC3: "Consultancy for CDMP-ITB for strategic planning and organization"

General Assessment:
This activity is to be implemented in the IUDMP Phase 3.

Activity IEC4: "Public education campaign for earthquake hazard awareness: pilot project focused on selected schools"

General Assessment:

This activity produced a good example of experience in developing public awareness material in earthquake, as well as lessons on how to implement awareness program for school children through earthquake school safety practices, such as understanding how earthquake happens and what is its impact, finding and securing hazardous object, duck and cover exercise, evacuation drill etc..

The challenges found during the implementation were lack of available education material on earthquake hazard suitable for school children and lack of reference materials to help organize workshop and training of (little) trainers on earthquake phenomena and earthquake safety drills for school children. The program produced many good reference materials for a similar program if it is to be replicated in the future.

The program was very useful for school in general and especially for school children, in order to make them understand the earthquake phenomena and its impact when it strikes a city. By implementing the program, it is hoped that the awareness and preparedness of school children in Bandung would be improved.

7.4 Training Component

Activities achievement under the Training component follows:

Under IUDMP Phase 1

Activity 1: "Identify the national institutions for the National Partner Training Institution (NPTI) selection"

General Assessment:
Several institutions had been identified for potential NPTI's, and had been invited for their interest. They are:

- Pusat Pendidikan dan Latihan (PUSDIKLAT) of the Ministry of Public Works, the training and education center for the employees of the Ministry, which has important facilities throughout the country
- Badan Pendidikan dan Latihan (BADIKLAT) of the Ministry of Home Affairs, the training center for the Ministry's employee, including local government officials
- Lembaga Pengabdian Kepada Masyarakat (Institute for Community Services and Development) of Institut Teknologi Bandung

- Pusat Penelitian dan Pengembangan Pemukiman (Regional Center for Human Settlement) of the Ministry of Public Works

From the identified institutions, only the Institute for Community Services of the ITB and BADIKLAT of the Ministry of Home Affairs had submitted their proposals.

During this phase, little progress had been made related to training program and institutional process, as the objective of the program in term of goal setting and achievement was unclear.

Under IUDMP Phase 2

Activity T1: "Support NPTI establishment and implementation of 1st national UDM training, with target 1 training for 25 participants from various interest groups: local government officials, professionals NGOs, journalist, and other interest groups"

General Assessment:
During this period, a training institutions networking scheme (ADMIT) was set up in Bangkok, and partners were invited to discuss the prospect of future collaboration, and several progress have been achieved by some of the AUDMP countries in implementing the training program.

However, in the case of IUDMP, the training program did not worked as expected due to many reasons. The program has selected two NPTIs, i.e. the Badan Diklat (Training and Education Agency) of the Ministry of Home Affaires and the Institute for Community Services of ITB (the outreach arm of the university) with the expectation that the two will maximize their own strength into successful collaboration. It is understood that it is difficult to force two organizations with different culture to work together, and this is one of the reasons that it did not work. The second reason was related to the allocated fund for implementing a pilot UDM training, which was very limited and considered insufficient by both organizations to produce a fruitful training. The third reason, was the transition period created by political changes in the country, resulting in many uncertainties relating to local government competency in disaster mitigation, and also to the organization of the involved NPTIs, hence it was difficult to make any long term commitment for the program.

It was concluded that the available budget would be rolled up into IUDMP Phase 3, where an exercise of a national UDM training will be implemented in order to prepare for a more institutionalized future training program. It is now understood that disaster mitigation is not yet in the mainstream of the political reality in many local government setting, and no commitment of resources from local government could be obtained at this stage for the sustainability of the training program. Nevertheless, in the future, when the local government structure and competency

become mature enough, and the demand raises, the exercise can provide a valuable reference for institutionalizing such program.

Activity AT1: "Disaster Journalist Training"

General Assessment:
This workshop was considered as fruitful as it develop the knowledge and raise the awareness of mass media personnel on types of disaster, and efforts to mitigate it, and in particular on earthquake disaster. By attending this workshop, it is hoped that journalists could write articles on disasters with the better perspective. It was also considered as successful, as the training workshop was organized by a private institution (a newspaper company) as the program implementing agency. IUDMP team provided only some resource persons as instructors (and of course the fund to implement it). There was feeling that this kind of training could be replicated on a (semi) fee-based mechanism, as there were requests to replicate the training for more participants in other cities. The training modules produced in the activity could be used with some improvement for future replication.

Activity AT2: "Training for Building Control Department staffs on building monitoring control system"

General Assessment:
The challenge found during this program was that the of the Local Building Office staffs attending the workshop came from different education background, in level as well as in disciplines. This program has improved the understanding of the Local Building Office staffs on earthquake phenomena and its impact to buildings, and also improved the understanding of the available building regulation and the capability of field staffs to implement the building monitoring system.

The activity produced training modules that can be replicated in the future, as there were requests to conduct similar training for staffs who had not attended the course. It seems also that this kind of program can be replicated with other cities, when they are able to allocate some resources in the future.

8.0 Lessons Learned

During its implementation, the project has involved many participants from various organizations under the local government as well as the national level institutions. This chapter discusses various issues related to the experience which characterize the lessons learned from this project, viewed from the implemented risk mitigation strategy activities, which are divided into three groups, i.e. improvement of city development processes, improvement of disaster

management institution and raising public awareness. A lessons-learned survey amongst the participating project organizations has been conducted in August 2000. Project participants gave valuable input to the project management on project implementation, hindering factors, positive outcome, and future initiatives. The discussion on the survey result follows.

8.1 Improvement of City Development Process

In phase I of Indonesian Urban Disaster Mitigation Project, risk assessment process was conducted in the city of Bandung as its' pilot project city. The risk assessment process consist of identifying seismic hazard at the city level, through the determination of peak ground acceleration (PGA) which might occur in Bandung, presented as PGA contour, and assessment of secondary hazard such as landslide and liquefaction prone-areas and also fire prone areas. The vulnerability of the city was assessed based on its socio-economic condition and demographic situation, its building stocks, specific vulnerable areas such as dense dwelling areas, emergency response structure etc.

Several approaches have been used to develop the understanding of the seismic risk of the city, some are somewhat less successful, such as the use of micro-tremor survey. The development of risk index to describe risk level of each smaller parts of the city provides some insights into factors contributing to high seismic risk, which lead to identification of high-risk areas. The use of a damage scenario introduced by the RADIUS project provides more understanding of the risk level of the city, as it develops estimates on loss of property (buildings) and loss of live, including the damage level of various infrastructure, in case of an earthquake occurrence.

The most critical issue during the process is the lack of availability of accurate information. Because disaster mitigation is a relatively new concept for the participating organizations, the data in their possessions are not structured or recorded to support these kinds of analysis. Many assumptions and simplifications have to be made in data collecting processes, such as the survey method for building stock condition, based on sample survey.

A lot of coordination with the participating organizations and agencies were necessary to understand the information available and to request for specific information, while their time were mostly limited due to the daily routine jobs of the contact persons, which are not fully available for these projects. A lot of time was also needed to disseminate the understanding of the seismic risk of the city, once the risk assessment has provided enough information depicting the risk level of the city. Several workshops had to be run to explain the results to various stakeholders and still no actions were produced to follow up the process.

After the risk assessment process was conducted, then the next stage is to

implement a mitigation program as part of the city development process. This strategy is directed toward the safety improvement of the built environment in the city, by controlling the process of urban development at the macro and micro level. At the macro level, improvement was focused on the spatial planning and zoning process. The related activity to this strategy is the review of the Bandung Spatial Planning with regard to seismic safety and preparation of a technical guideline for spatial plan review. At the micro level, improvement is focused on the means to control building processes, which include review and improvement of the local building regulation and strengthening of the building monitoring system, which include building control staffs training. In collaboration with the RADIUS project, the IUDMP team developed a more comprehensive and longer - term strategy in the form of an action plan.

Based on the result of the survey, it was stated that the project has a positive effect on the participants. Participants agreed that each activity has produced specific benefit for their organization. The most important benefit is that besides opening their horizon and bringing new perspective and insight toward their work related to seismic risk, it also improves their capacity in coordination and collaboration and developing their network with other organizations. Other benefit of the project is that the participant's organization became more socialized to the public and to other agencies, thus providing a window of opportunity for the organization to work in collaboration with other organization on other projects.

The outstanding issues derived from the survey result are related to the less successful aspects of the project. The participants identified socialization as the key issue, where some participants felt that the project did not conduct adequate socialization process to other organizations and to the public in general. Socialization became an important issue because Bandung people's appreciation toward disaster mitigation, especially earthquake disaster is quite low as described in the beginning chapter of this report. The project still needs follow-on activities to really implement the result into operational practice and need socialization to reach more audience. This is actually an issue of disaster mitigation project sustainability that will be further detailed in the next chapter. Another issue is the priority list, where in the current Indonesian context, there are many other things in the priority list other than disaster mitigation, during the difficult economic and political transition period.

The survey participants also identified hindrance factors. Most participants identified coordination problems and lack of time as a hindrance factor. The difficulty in setting a firm time frame for the project and finding enough time to discuss the work and its progress shows again that mitigation related work is not in the first priority list of the participating organizations. The lack of accurate data and information is also another important hindrance factor that affects the accuracy and the applicability of the analysis. The lack of information is also caused by the lack of coordination between various stakeholders.

Factors that support the project implementation are good relationship and solid teamwork effort between the project management team and the participating organizations including the local government, which is based on mutual respect between the parties. Most participants stated that their project were a success in terms of the product that they have produced, such as an action plan or the number of attendance in the training held by the project. Other stated that although they have carried out the project as best they can, it would take time for the output to be really accepted and adopted by the city's stakeholder. Such as the development and implementation of building monitoring system for the Municipal Building Control Office, which was successfully conducted, but the city has not yet taken any action to follow on the recommendations.

8.2 Improvement of Disaster Management Institution

The risk mitigation strategy in improving disaster management institution was focused on improving the legal and institutional framework of the disaster management unit in Bandung City. Activities include the review of pertinent national policy framework and the improvement and strengthening of the local Disaster Management Coordination Board in the City through the improvement of its Standard Operating Procedure and support for the establishment of the local Emergency Operation Control Center (EOCC). A City Operational Emergency Plan for Earthquake Disaster was also prepared.

The survey participants identified several positive effect of the project. First, it generally develops and increase cooperation also coordination between related institutions, government agencies in the policy level and the community level, and experts in mitigation activities. Second, by carrying out the project, the participants increase the awareness and preparedness of the government and community toward earthquake disaster mitigation. Furthermore by implementing the project at the community level, the SATLAK PB (the City Disaster Management Coordinating Unit) felt that the organization became more empowered and recognized by the community.

At the macro level the project has developed a National Mitigation Policy draft (which still needs further works for acceptance at the national level). It is hoped that it would be beneficial for the country in reducing disaster risk in urban communities and provide a framework for urban development planning which integrates the principle of disaster mitigation within the process. At the micro level, the project succeeded in developing Standard Operating Procedure document and Emergency Operation Control Center development plan and documents. Other than that, the project also increases human resources capability at the national level (such as BAKORNAS PB- the National Coordinating Body for Disaster Management) and at the local level (SATLAK PB) through several awareness and socialization sessions (workshops), which is hoped to also in turn strengthen their capacities.

The outstanding issue of the project is the inherent constraint of the disaster management agency itself, be it in the national policy level (BAKORNAS PB) or in the local community level (SATLAK PB). The agencies above still put heavy emphasis on emergency response and less on prevention and mitigation side of disaster. Currently BAKORNAS PB is much preoccupied by the social conflict and complex emergency situation occurring in many parts of the country, and its' attendant problems, such as handling of internally displaced persons. For other types of disaster (earthquake, flood/flash flood, landslide, volcano, etc.) coordination effort seems to be intensified during disaster period only, for emergency response purpose.

The non-existence of a legal basis for disaster management in Indonesia is another outstanding issue. There is currently no law/act on disaster and disaster management, which could enhance the initiatives in mitigation and prevention of disasters. Other legal provisions related to disaster prevention can be found spreading in other acts, such as the Government Regulation on Regional Spatial Plan etc. In fact the BAKORNAS PB and SATLAK PB is an agency with no vertical authority at all. In general, the effectiveness of the agencies in disaster prevention and mitigation is difficult to be fully developed because of these inherent constraints.

Another outstanding issue is the slow decision-making process. The output of the project in the macro level such as the National Policy on Disaster Mitigation needs to be approved by the inter-ministerial deliberation, which would need more inter-ministerial working groups discussions. It is often that different person representing an organization assists at those meetings, which means that no continuity in the deliberation process.

The same experience was felt also at the local level, when the EOC (RPUPUSDALOPS) documents, i.e. the General Procedures and the Development Plan, Technical Guideline and Workbook and Orientation Guideline, which have been prepared, need the Mayor's approval. Thus up until now, the slow-decision making process has hampered the mitigation efforts conducted above. This of course is due to the lack of priority for disaster mitigation and lack of leadership, a current phenomenon in the culture where centralism is still predominant.

Several hindrance factors were identified as hindering the project implementation. The unavailability of time from resource persons, especially from related institutions became the first hindrance factor. Another hindrance factor is the lack of resources in terms of funds and personnel in the participating organizations, in particular at BAKORNAS PB and SATLAK PB. This made coordination of disaster mitigation and prevention activities became very limited, thus slowing down the project. The low awareness level of the Bandung people is another challenge to the project, as disaster mitigation tends to be ignored as an option for coping with disaster. At the community level there are only very little

awareness raising programs conducted in a coordinated and sustainable manner. The ignorance leads to the lack of priority for disaster mitigation, and usually it is not part of the priority list in agencies and institutions dealing with (urban) development issues and provision of services. In most cases, local authorities put disaster mitigation efforts on the lowest priority in their annual budget setting.

Supporting factor to the project is the high motivation of the IUDMP project participants in implementing the project. Although many obstacles came across, the team completed the project with products as proof of result. Relentless efforts from the team and project participants were required for achieving the project goal. The flexibility of the funding available from IUDMP, in term of procedure of allocation, is another supporting factor also. The local government provided in-kind supporting contribution in term of staff time and also some local funds to support the project.

8.3 Raising Public Awareness

The mitigation strategy in raising public awareness was achieved through various public campaign activities for disseminating information and public education program. The target groups for the information dissemination and networking activities are government and non-government organizations, including private participants such as investors, architects, engineers and other community groups as well as the general public.

Workshops are used as the main information dissemination media, covering different types of target groups such as decision-makers and practitioners, journalists, schoolteachers and school children. Other methods of dissemination include the use of mass media such as articles in newspaper and magazines, radio broadcasts and the use of web-site. Information is also disseminated through the distribution of small booklets, leaflets and posters on earthquake mitigation. A web site, www.kompak.or.id is established to provide easily accessible, interactive information media for those who are literate in IT.

According to the survey participants the public campaign activities have a positive effect for the project and target group. The project had enriched the perspective of the audience/ target group on what earthquake is, how it occurs and the mitigation effort that should be done. The target groups have a deeper understanding about the process of disaster occurrence.

A polling conducted by a local newspaper shows the needs for public awareness campaign. The local newspaper polling was done after the IUDMP team implemented the awareness raising campaign. The local newspaper research team, conducted polling via telephone to 500 Bandung people selected by random with 3 percents margin of error. The team called 244 male respondents and 256 females between the age of 17 to 56 years old. The goal of this polling is

to sound the level of understanding, view and preparedness of Bandung people in facing natural disaster, especially earthquake. From the polling result, 382 respondents (76.4%) realize that Bandung is vulnerable to disaster. About 118 respondents (23.6%) said that they did not know that their city had potential for disaster.

This awareness is almost the same in all levels of education. The awareness rates have a positive correlation with education level. But most of the respondents that realize the potential disaster, identify flood as the main threat of hazard (68.85%) and fire (15.18%) Only 7.59% respondents have experience in landslide, earthquake (7.07%) and volcanic eruption (1.04%). Even though earthquake rarely occurs, about 53.4% respondents thought that earthquake is a threat to the city. About 41% respondents thought that earthquake was not a threat and 5.6% respondent did not know what to answer. About 65.2% respondents stated that they knew how to save themselves if a disaster occurs.

Another effect of the project is the development of a positive interaction between researcher and the common people/public in an effort to increase the human resources quality in order to have a better and safer city. The project also widens the information access and cooperation between related organization, government agencies, the journalists and the common people. This means that the campaign decrease the information gap between the research institution and the public.

However, it was felt then that the implemented awareness raising initiative had limitations. Only a few target groups were reached during a very limited duration/ time frame, due to limitation of resources. Sustainability of the project was under question. The general feeling is that the project still needs follow-on activities to really implement the result into a more sustainable, operational practice and need continuous socialization to reach more audience and the general public. A big challenge for the project sustainability is the lack of response from the people and government officials on the earthquake hazard in Bandung, since the city has never experienced strong, damaging earthquake before. Earthquake is not a very interesting subject for the people, and it is not a priority hazard among the current hazard list.

Project participants identified several factors that hindered the project implementation, i.e. scheduling (coordination) problem due to lack of priority, lack of data such as school buildings under construction and limited number of available education materials related to earthquake mitigation for school children.

The supporting factor of the project is the enthusiasm shown by the target group when IUDMP team implemented the awareness campaign. There were such enthusiastic response from school children and schoolteacher participating in the school education campaign activity. Their presence in such activities and willingness to contribute their time out of the school's busy schedule was very

much appreciated by the IUDMP team. Another supporting factor is the good teamwork between IUDMP project team and other organizations, especially government agencies such as local office of education and culture. This has made implementation project run smoothly without much delay. As resources were limited, the team had to be more creative in developing materials and disseminating them to the targeted group.

The success of the project in raising public awareness cannot be measured by the number of products developed or the number of participants attending the workshops/ training. However the participants (targeted group) themselves stated in a survey conducted by the project team that the awareness raising activity was quite good and have given them insight. They also suggested to conduct public awareness raising activity continuously in the future, involving other target groups while improving the quality and the coverage of the dissemination topics/material.

9.0 Sustainability

The IUDMP Team defines sustainability of mitigation efforts as the continuous embedding of disaster mitigation principles and activities into the development processes in the country. The IUDMP approach has been to work at the local level with the Municipality of Bandung and to make use of training and networking to spread the mitigation principles. Thus, the sustainability relates directly to whether the project has been successful or not in changing the attitude of the organization and the community into a more proactive posture, adopting the new knowledge into their own hand to take the necessary measures.

In the current Indonesian context, where there are many other things in the priority list during the difficult economic and political transition period, the sustainability becomes a big challenge. A survey conducted by the IUDMP to the project participants, shows that project participants often question the sustainability of the project. Most of them stated that sustainability is a central issue e.g. the issue of how to carry on the work and what the focus of mitigation efforts was remaining significant. Embedding principles of mitigation at the city level has not been easy. However, there is a good sign that the partners who were working together in the IUDMP project are still in good contact and have a better understanding of the situation, so they would be very keen to collaborate again for the continuation of the works, provided that resources are available.

Not all of the project implemented under IUDMP could be sustainable as described above. The success of a project could not guarantee whether project will be sustainable or not. Thus, after careful considerations and evaluation from IUDMP core team, several projects component considered to have the sustainability should include the following:

- Center's Support

- National Policy Follow-up
- Networking
- Information and Education Campaign
- Training program

The creation of the Center is very important to continue to support. The Center will be able to continue to carry the banner for mitigation. The experience in Bandung has pointed up how the Center can be relevant to an increasing number of organizations.

National policy follow-up is a kind of opportunity to work with wider organizations such as BAKORNAS, the Ministry of Human Settlements, the Ministry of Home Affairs, and the Ministry of Scientific Research. It is contemplated that this might take the form of, besides participation in workshops and seminars as well as responding to request for assistance emanating from the national level, continuing the previous work on the national strategy for urban disaster mitigation in order to produce a nationally accepted policy.

Networking has been a major objective of the IUDMP and needs to continue to be emphasized. Since IUDMP has not yet built a viable network, the correct method needs to be found to make the community (individuals and organizations) interested in disaster management in Indonesia more cohesive. Collaboration with new networks to push the message out also helped the sustainability. Network building by using the Internet has not yet proven to be successful, in part, this is due to the constraint in the medium itself and in part to the techniques used to promote the network.

Information and education campaign for the public should be conducted in a sustainable manner. The activity focussed its attention on concerned schools preparedness, and raising public awareness through broadcasting program. Both were part of Phase II and appear to have been successful. The school preparedness program should be expanded not only in Bandung at the elementary school level, but also to other target groups in the country. Raising public awareness through broadcasting media should also become a part of sustainability. A series of talk shows and insert program on earthquake hazard would be beneficial for the community in other cities with high seismic risk. The value of both of these activities is that they will produce models that can be used in other places.

An institutionalized training program will provide an opportunity to disseminate disaster mitigation knowledge and experience to a wider audience in the country, thus promoting the concept to more cities and producing more mitigation advocates. A good tested training modules with appropriate institutional and financing scheme will promote the sustainability of the program itself.

10.0 Replicability

According to the understanding of the IUDMP team, replicability relates to the factors which contribute to the success of the implementation of similar projects in other cities or in a larger setting, such as at the national or regional level, in a sustainable manner. The sustainability criteria relates to the perceived needs of the city or the country, which create a sustainable demand of the project and allowing resources to be allocated for it, meaning that fund would be generated or found somewhere else for implementing the project.

Experience from implementing IUDMP reveals several factors as determinant to the success of the project:

- Availability of (human) resources capable of defining, managing and implementing a disaster mitigation project with perseverance, willing to co-operate and collaborate within project team
- Willingness of the city and/or the participating organizations to take risk to venture to the new area of disaster mitigation, where result is not guaranteed, at least in the short term vision
- Availability of strong leadership within the participating organizations, allowing actions to be taken within the organization to support the project, up to allocating resources
- Selection of realistic activities, within the capacity of the city or the organizations to carry out, and showing clear benefit related to the reduction of the disaster risk.
- Clear and continuous communication between the relevant parties and the public, to gain support from the community
- And last but not least, willingness to work hard to achieve best result

There must be many other factors contributing to the success or otherwise of the project which still need to be disclosed, but each new setting for the project, be it at city level or national level, will bring a new set of constraints and problems to be solved in a case by case basis. There is no general formula for a successful disaster mitigation project.

11.0 External Funds Support

The IUDMP project in Bandung has produced significant results for the city. In part this is due also to the organizations that have contributed funds to IUDMP, which showed their support and appreciation toward mitigation efforts. Funds came from various donors, international, national and local, other than IUDMP main donor i.e. ADPC. These funds support can be detailed as of the following:

- ***International Funds Support***
  The international organizations that supported the IUDMP program were the

RADIUS Project (Risk Assessment Tools for Diagnostic Urban Seismic Area against Seismic Disaster) and **UNESCO** (United Nations Educational Scientific and Cultural Organization).

Radius collaborated with IUDMP not only in the process of preparing the Bandung Action Plan for Earthquake Disaster Mitigation but also in socializing the products as shown in one of the IUDMP component, which is Workshop on Preparation of Action Plan for Urban Seismic Disaster Mitigation activity. The workshop was held in April 14 1999 at West Hall ITB. The fund provided was for the workshop itself. Total RADIUS fund from the UN-IDNDR Secretariat was US$ 20,000.

Other than Radius, an international organization that contributed in funding the IUDMP activities was UNESCO. This organization contributed to IUDMP project component which was information and education campaign for school children activity. The project objective was to increase awareness and preparedness of earthquake hazard for school children. The contribution was focussed on the development of Education Material i.e. booklet and poster which was disseminated during the implementation of the school education campaign program. The total fund was US$ 5,000.

- ***National***

  National level organizations in Indonesia that supported funds for IUDMP is BAKORNAS PB. BAKORNAS PB is the organization for disaster management coordination in Indonesia, chaired previously by the Coordinating Minister of Social Welfare and Poverty Alleviation, and now under the new structure is chaired by and responsible directly to the Vice President. BAKORNAS PB was involved in the implementation of the Development of National Policy activity: the Workshop on National Policy for urban disaster mitigation held in 18 April 2000 at Hotel Millennium Jakarta by sharing the workshop cost.

- ***Local Funds***

  The municipality of Bandung supported IUDMP activities by contributing local funds ± Rp. 20.000.000. The funds were allocated into several IUDMP activities, which are of the following:

  1. Review of Bandung Spatial Planning with regard to Seismic Safety and Preparation of Technical Guideline for Implementation by the Municipal Urban Planning Office activity.
  2. SOP (Standard Operation Procedures) Socialization Workshop activity for SATLAK members and Preparation of Socialization Material activity. The workshop was held on March 29, 1999 at Bale Pakuan Convention Center Bandung.

- ***In-kind Contribution***

  Several organizations contribute in-kind support to the project. The Institut Teknologi Bandung contributed with resources (personnel, office space, services like electricity, water etc.) and also donated part of the overhead expenses, amounting to 12% of project grant value. The municipality of Bandung supported IUDMP activities by providing staffs time and also office space and related facilities.

Project Contacts

For further information about the Indonesian Urban Disaster Mitigation Project, please contact:

1. Dr. Krishna Pribadi
Project Manager
Indonesian Urban Disaster Mitigation Project
Dept. of Civil Engineering, ITB
Jalan Ganesha 10
Bandung 40132
INDONESIA

Tel: (62-22) 251-0718
Fax: (62-22) 251-0718
Email: <iudmp@melsa.net.id>

2. Ir. Andi Oetomo, MPI
Centre for Urban and Regional Development Studies (CURDS)
Institute of Technology Bandung
Jln. Ganesha, No. 10
Bandung
INDONESIA

Tel: (62-22) 250-4735
Fax: (62-22) 250-4735
Email: <aoetomo@pl.itb.ac.id>

3. Dr. Kamalia Purbani, MPI
Regional Development Planning Board
Municipality of Bandung (BAPPEDA Kota Bandung)
Jln. Wastukencana No. 2
Bandung
INDONESIA

Tel: (62-22) 431-929
Fax: (62-22) 431-929
Email: <bappeda@melsa.net.id>

4. Ms. Suthira Suwanarpa
Asian Disaster Preparedness Center
P.O. Box 4 , Klong Luang
Pathumthani 12120
THAILAND

Tel: (66-2) 524-5354
Fax: (66-2) 524-5360
Email: <suthira@ait.ac.th>

The **Asian Urban Disaster Mitigation Program (AUDMP)**, launched in 1995, is the largest regional program of ADPC. The program, with core funding from the Office of Foreign Disaster Assistance of the United States Agency for International Development, will ultimately work in ten or more countries of the region. The program was designed to make cities safer from disasters. The goal of the AUDMP is to reduce the disaster vulnerability of urban populations, infrastructure, critical facilities and shelter in targeted cities in Asia, and to promote replication and adaptation of successful mitigation measures throughout the region. Towards this end, the program develops and supports national demonstration projects, information dissemination and networking activities, and policy seminars and professional training in the target countries of Bangladesh, Cambodia, India, Indonesia, Lao PDR, Nepal, Philippines, Sri Lanka, Thailand and Vietnam.

The **Asian Disaster Preparedness Center (ADPC)** is a regional resource center dedicated to disaster reduction for safer communities and sustainable development in Asia and the Pacific. Established in 1986 in Bangkok, Thailand, ADPC is recognized as an important focal point for promoting disaster awareness and developing capabilities to foster institutionalized disaster management and mitigation policies.

For more information, please get in touch with us at the following address:

Asian Disaster Preparedness Center (ADPC)
P.O. Box 4, Klong Luang, Pathumthani 12120, Thailand
Tel.: (66-2) 524-5354
Fax: (66-2) 524-5360
E-mail: adpc@ait.ac.th
Website: www.adpc.ait.ac.th