



**Earthquakes and
Megacities Initiative**

**The Cross-Cutting Capacity Development Program
“3cd Program”**

Program Definition and Implementation Plan

(Version 3-2 – February 25, 2004)

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I. INTRODUCTION

The *Cross-Cutting Capacity Development Program – 3cd Program* -- is conceived as a long-term (6 years or more) inter-disciplinary program to address disaster risk management¹ and urban vulnerability reduction concerns in complex urban environments (i.e., megacities). The Program is intended to fill the void created by the lack of a set of accepted standards and practices that can be successfully applied to megacities as well as the limitations of current urban disaster reduction initiatives in addressing megacities’ special challenges and opportunities. The key goal of the 3cd Program is to shift the current disaster management processes of local governments in developing countries from response-oriented to mitigation-oriented. Unless mitigation is implemented at the local level, the negative effects of urbanization will continue to overshadow progress in sustainable development and poverty reduction in megacities. EMI will implement the 3cd Program in partnership with EMI’s Cluster Cities partners, mainly its city partners in Asia and East Asia, and selected institutions partnering with EMI in its disaster reduction agenda.

This document defines the 3cd Program’s scope, objectives and implementation framework. It is intended to serve as a planning guide for developing program activities, establishing partnership agreements, and developing funding proposals. EMI is continually engaged in developing a consensus agenda on the program suggested herein through consultation with EMI partner cities and various respected organizations and institutions engaged in disaster reduction.

¹ The notion of disaster risk management is taken here as representing disaster risk assessment, prevention, mitigation, preparedness, response and recovery.

The Program's first phase focuses on assessing the current practice of disaster management in megacities and identifying gaps and users' needs. Based on this assessment, a specialized disaster risk management capacity building program for megacities will be developed and delivered in selected cities to prepare them for implementing a comprehensive *disaster risk management master plan (DRMMP)*. The concept and components of DRMMP are explained in Appendix A of this document.

II. BACKGROUND

The Earthquakes and Megacities Initiative (EMI) is an international not-for-profit scientific non-governmental organization dedicated to the acceleration of earthquake preparedness, mitigation and recovery of large urban areas (i.e. megacities). EMI serves as a catalyst for the delivery of scientific and technical knowledge to end-users. EMI focuses its efforts on developing capacity in megacities of the developing world where the effects of earthquakes and other disasters could be devastating to the people, their economy, their culture, and their environment. EMI was officially launched in 1998 and is now a registered non-profit organization in the Philippines.

EMI's programs emphasize the development of approaches that can be put in place by local governments with the support of local researchers and practitioners. The goal is to instill a culture of prevention and to engage communities and their governing bodies in the process of disaster mitigation. Within its program, EMI promotes the establishment of comprehensive city-wide disaster risk management systems (i.e., DRMMP), and the development of tools for disaster assessment and disaster management such as information and communication technology (ICT), that enable megacities to understand their risk and take actions to reduce their exposure to disasters. The knowledge of hazards and risks builds institutional strength, increases accountability and triggers pro-active intervention.

Working with its city partners, EMI has accumulated a body of knowledge and experience pertaining to the dynamics of policy making at the local level, the institutional constraints that influence the setting of priorities by local governments, and the impediments for disaster risk reduction initiatives. EMI's interaction with local institutions has also provided an understanding of the current practice of disaster risk management in large cities. Institutionalization of disaster mitigation at the local level remains however a distant goal, as many megacities have presently little if any capacity for disaster reduction. At the same time, the risk from earthquakes and other disasters keeps increasing, particularly in developing countries, due to the upsurge of urban population, aging infrastructure, inadequate socio-political structures, and weakness of institutions. Much more effort and resources are needed from governments, international inter-governmental agencies, humanitarian agencies, the research and professional community, and other stakeholders to bring focus towards the vulnerability of megacities.

Disaster management practice in megacities is further hindered by the lack of competent standards and methods for sound practice. The body of knowledge and experience specific to megacities is meager compared to the needs associated with the complex management environment of megacities. The fragmented conventional mono-discipline approach to the

development of knowledge does not lend itself to practical methods in a field that requires integration of knowledge from several disciplines. The current mechanisms for transfer of knowledge into practice are inefficient due to weaknesses in institutions and lack of training and capacity building programs. As a result, knowledge is often limited to a few experts or remains in documentation (such as building codes) and, as a result, is not systematically understood and implemented by practitioners. Furthermore, currently there is no knowledge base of current practice that can serve as a reference in the field, nor are there any guidebooks or manuals that could guide researchers and practitioners on implementation.

These observations have served as a foundation for the design of the 3cd Program, which is based on four premises:

1. It will undertake practical applications in partnership with local governments in order to serve their needs.
2. It envisions a long term and sustained effort to impact institutions and practices.
3. It provides the opportunity for the local researchers and practitioners to undertake the bulk of the investigative and analysis work in order to develop local capacity, and build the synergism between the research community, the local authorities and local community.
4. It is open to the participation of any organization or institution that has an interest and a commitment to urban disaster vulnerability reduction.

III. OBJECTIVES

The 3cd Program is a mechanism for capacity building in support of disaster risk reduction in complex urban environments (i.e., megacities). The key goal of the 3cd Program is to shift the current disaster management processes of local governments in developing countries from response-oriented to mitigation-oriented. This objective is achieved by influence government policies in favor of disaster reduction and providing the capacity for a sustained implementation effort. The 3cd Program intends to develop and implement - in collaboration with city authorities and local practitioners and researchers - an ensemble of action plans that together constitute a city-level *disaster risk management master plan (DRMMP)*.

EMI has identified the lack of sound methods and tools appropriate to megacities as a critical gap that must be filled to help local governments and local institutions undertake this critical transformation from a response orientation to an integrated approach to risk management. In many developing countries, policy-makers have developed an appreciation of mitigation but do not know how to implement it. There are few models and methods and no comprehensive knowledge base pertinent to megacities. Mitigation requires an integration of knowledge from different disciplines and a consensus among stakeholders on a common agenda. These conditions create an environment that impedes implementation of a public policy agenda promoting mitigation. The objective of EMI's 3cd Program is precisely to address this fundamental problem. Through 3cd implementation, EMI will strengthen its coalition with its partners, create implementation mechanisms at the local level, and improve the practice of disaster risk management pertaining to megacities.

IV. SCOPE

Overall, the 3cd Program is comprised of four integrated components that converge towards the implementation of a DRMMP in each participating city. The four components of the 3cd Program are indicated in Table 1. The components of the 3cd Program have two separate but complementary sets of activities: those related to research and development (R&D) and those focused on implementation of knowledge and improved practice through the DRMMP. The R&D activities support the implementation of the DRMMP by providing the methods and tools in specific areas of practice. The R&D activities are listed in Table 2 and further detailed in Appendix C.

Table 1: 3cd Program Components

<i>Program Components</i>	<i>Definition</i>
Component 1.	Analysis of Knowledge and Practice
Component 2.	Training and Institutional Strengthening
Component 3.	Disaster Risk Assessment
Component 4.	Development of City-Wide DRMMP

Component 1: Analysis of Knowledge and Practice

This component develops an evaluation methodology and collects, synthesizes, and assesses current disaster risk management practice and gaps in knowledge and practice in as many as ten megacities that currently partner with EMI in its Cluster Cities Project. The study will include both field investigation and extensive literature search to identify gaps, needs and impediments to risk reduction in the cities and to define strategies for implementation based on local realities. The work will draw on EMI's strong relationships with the authorities, researchers, practitioners and disaster risk management specialists of these megacities. The research methodology will be developed by a team of international experts with participation from local officials and policy makers. Data collection and synthesis will be undertaken by local researchers working with international experts. Several workshops are planned, including at least one workshop in each city to engage the city's authorities and managers in the process and to connect with other stakeholders including central authorities.

The component will establish the foundation for 3cd Program implementation and produce the following outcomes to meet 3cd Program objectives:

- Understanding of the structures of local institutions involved in disaster risk management functions (i.e., urban planning, public works, housing, public health, social welfare, and emergency management), their role and their inter-relationships with local and central governmental agencies in charge of disaster risk management.
- Understanding of the organizational and institutional strengths and weaknesses, and identification of the gaps in the planning and delivery of disaster risk management functions within local governments and local institutions. Documentation of the role of NGO's, CBO's and other stakeholders in local disaster risk management efforts.
- Development of an electronic *Knowledge Base* that compiles current initiatives, case studies and methods that encompass the practice in disaster risk management in major metropolises. This Knowledge Base is intended to serve as a reference source in the field.
- Development of a *Manual of Sound Practice* that can be used as a guide for assessing, managing and reducing risk in complex urban areas, and a related strategy for implementation.
- Development of an *Implementation Strategy Manual* that reflects the complexity of the social, political, and cultural structures of megacities and that defines an approach for improving current practice in megacities in developing countries to be used in future intervention.
- Dissemination of developed documentation to practitioners, researchers, and public officials.

Component 2: Training and Institutional Strengthening

This component consists of developing and beta testing a specialized training program in urban disaster risk management to support the development and implementation of a Disaster Risk Management Master Plan for large metropolises in developing countries. The training will target local officials and professionals involved in earthquake risk reduction, including urban planners, building code officials, construction professionals, public works engineers, emergency managers, health safety specialists and social workers. The program will be administered in cooperation with EMI's city partners and partnering institutions currently participating in EMI's Cluster Cities Project. First the training curriculum will be tested in one megacity (selected from among EMI city partners); then the final training material will be prepared for implementation in several megacities in subsequent phases of the program.

The aim of this component is to ensure knowledge building, capacity development, institutional strengthening and sustainability in relation to implementation of the city's DRMMP.

Key outcomes and deliverables of this component include:

- Training documentation including a training manual and associated training delivery material (e.g. visuals, multi-media material, brochures, case studies, field trip agendas).

- An *Implementation Strategy Guidebook*, including a work plan for implementation of the training program in subsequent phases of the 3cd Program, developed in consultation with end-users.
- Summary report on existing urban disaster risk reduction training programs, gaps and needs, and the goals and objectives of proposed training.
- A specialized curriculum for training local officials as well as local professionals and practitioners in disaster risk management, including techniques for disaster assessment, scenario analyses, disaster and emergency management, disaster preparedness and disaster risk reduction. The methodology will be designed to apply to all disasters but the application will focus on the earthquake peril.

Component 3: Disaster Risk Assessment

Cities cannot effectively manage disasters if they do not have an institutional understanding of the potential impact of earthquakes and other perils that threaten their population, infrastructure and economy. Disaster risk assessment constitutes the first step in disaster risk management and provides the technical foundation for the development of the DRMMP. This component includes providing state-of-the-art disaster risk assessment technology (see Study Area 2), and technical support to local authorities in assessing their exposure to risk and quantifying their risk profile. In particular, it will identify appropriate scenarios, develop the necessary data, run the scenarios, and structure the results for various users. It also provides support in the interpretation and validation of results and follow-up advice in the development of risk reduction strategies.

The disaster risk assessment technology will be installed within appropriate city departments. City personnel will be trained and supported in the use of the technology. In addition to serving as a disaster risk assessment tool, the technology serves as a data consolidation and communication tool. Results from this disaster risk assessment process can be shared with various stakeholders and used in support of risk communication and risk reduction actions. The implementation of the disaster risk assessment component will be supported by the training developed in Component 2, which will include modules on the practice of disaster risk assessment and hands-on sessions for users to prepare, run and assess the results of their disaster risk assessment scenarios.

Component 4: Development of the DRMMP

This component centers on providing the technical and logistical support to participating cities for developing the city DRMMP. It starts with analyzing the results of the disaster risk assessment and then working with the city policy-makers to identify and select a city-specific complement of disaster risk reduction strategies for its DRMMP. The strategies will comprise such elements as:

- Understanding the social and physical risk parameters (disaster risk assessment) of the city
- Developing preparedness, response and recovery plans
- Education and capacity-building programs

- Developing approaches for risk mitigation involving urban land-use planning practices, code implementation and enforcement practices, and institutional strengthening.

Component 4 will also include determining a realistic implementation strategy for the DRMMP through ongoing outreach to stakeholders throughout civil society.

Research and Development Studies

There are large gaps in standards and methods for disaster risk management practice in megacities. Hence, a significant research and development (R&D) effort is needed to support the implementation activities of the DRMMP. Many of the R&D studies are already taking place in universities and research institutions in both developed and developing countries. The 3cd Program provides opportunities for researchers from these institutions to participate in the development of sciences and technology to support the implementation of DRMMPs. The 3cd Program is designed as a mechanism for integration of researchers and practitioners, principally those from developing countries, into an effort aimed at transferring knowledge into practice through a partnership with EMI and the partner cities and other organizations participating in the 3cd Program. In particular, four research and development areas have been identified as critical to support the implementation of the 3cd Program. These research areas are listed in Table 2 below and described in Appendix C.

Table 2. R&D Study Areas Incorporated in the 3cd Program

<i>R&D Study Areas</i>
Study Area 1. Methodological Framework to Support Component 1 (Analysis of Knowledge and Practice)
Study Area 2: Development of Disaster Risk Assessment Tools and Methods
Study Area 3. Development of Methods to Improve Standards and Practice for Building Construction and Land-Use
Study Area 4. Development of Methods to Build a Culture of Prevention

V. IMPLEMENTATION STRATEGY

The 3cd Program is structured as a partnership endeavor to be led and coordinated by EMI and implemented in collaboration with EMI’s partnering institutions and partnering cities. The role and responsibilities of each partnering institution are defined in a Memorandum of Cooperation (MoC) executed between EMI and the institution.

The mechanism for delivery of the 3cd Program is EMI’s Cluster Cities Project (CCP). The CCP groups cities in a regional setting under a framework for cooperation that is developed by the participating cities and is brokered, supported, and facilitated by EMI. The participating cities engage to: (1) share their experience in earthquake risk assessment and preparedness

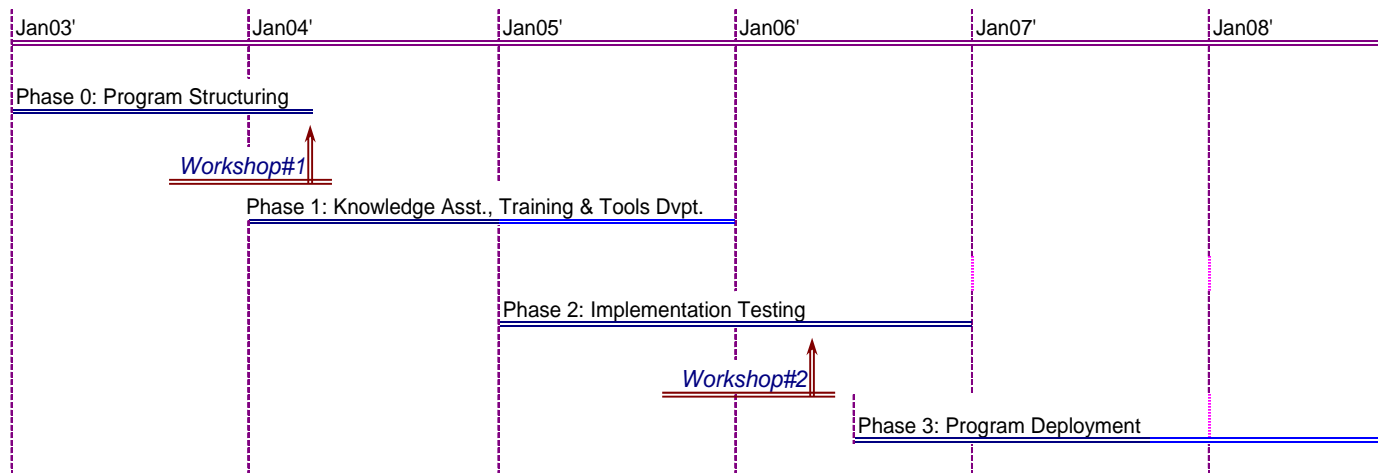
methods, (2) cooperate in disaster planning activities, and (3) assist each other in the undertaking of preparedness and mitigation projects.

The Cluster Cities Project offers a unique and well-suited environment for the implementation of the 3cd Program because it serves local governments and local institutions. The project currently encompasses a network of about 20 of the largest cities in the world in partnership with EMI. In addition to the cities' administration, the network includes academia, professional organizations, businesses and representatives of civil society. These organizations and institutions will thus constitute both the resources for and the recipients of the 3cd products.

VI. IMPLEMENTATION SCHEDULE AND APPROACH

The 3cd Program is intended to be implemented in four phases as shown in Figure 1:

Fig. 1: Program Implementation Schedule



Phase 0: Program Structuring (2003 – early 2004)

Phase 0 of the 3cd Program consists of structuring, organizing and establishing the framework for implementation. Key tasks include:

- Assembling the Program Team (See Organization Chart in next section)
- Consulting with potential partners and partner cities, defining roles and the working relationship between EMI and its partners
- Identifying funding agencies and securing funding for the program
- Holding a Program Organizational Workshop with program partners, program team, end-users (i.e., partner city) and funding agencies, to collect input and develop consensus on the work plans and implementation strategy

The key deliverable of Phase 0 is a comprehensive Program Implementation Plan that is understood and accepted by all the program partners. This phase is scheduled to be completed on March 31, 2004.

Phase 1: Assessment of Knowledge and Practice and Tools Development (2004 - 2005)

Phase 1 undertakes several tasks related to Components 1, 2 and 3 of the 3cd Program, as described above. Appendix B lists the detailed activities for Components 1 and 2 in Phase 1. In regard to Component 3, it is anticipated that Phase 1 will include an evaluation of information technology needs and selection and adaptation of a disaster risk assessment technology.

The key outputs and deliverables of Phase 1 include:

- Statement of current efforts and gaps in knowledge and practice pertaining to *disaster risk management master plans (DRMMPs)* for megacities.
- Methodological framework to assess sound practice.
- Training modules designed around specific objectives for arming large cities with *disaster risk management master plans (DRMMPs)*.
- An electronic knowledge base; the development of a sound practice manual, and the development of an implementation strategy manual to guide implementation in subsequent phases.
- Progress reports at specified intervals.

Phase 2: Proof of Concept: Pilot Program in Two Cities (2005 – 2006)

Before fully deploying the program, EMI will undertake a proof of concept phase in two cities selected based on the findings of Phase 1. In cooperation with these cities, a DRMMP will be developed that is specific to their conditions. The DRMMP will include a risk assessment component performed by the city staff with support from the 3cd program team; a preparedness and response plan; an education and capacity-building plan; and a mitigation plan focused on improved standards and practices for construction and urban planning.

The expected outputs of this phase are the development of components of two cities' DRMMP as determined jointly with the cities and initial steps toward their implementation.

Phase 3: Program Deployment – Multi-Cities Implementation (2006 and beyond)

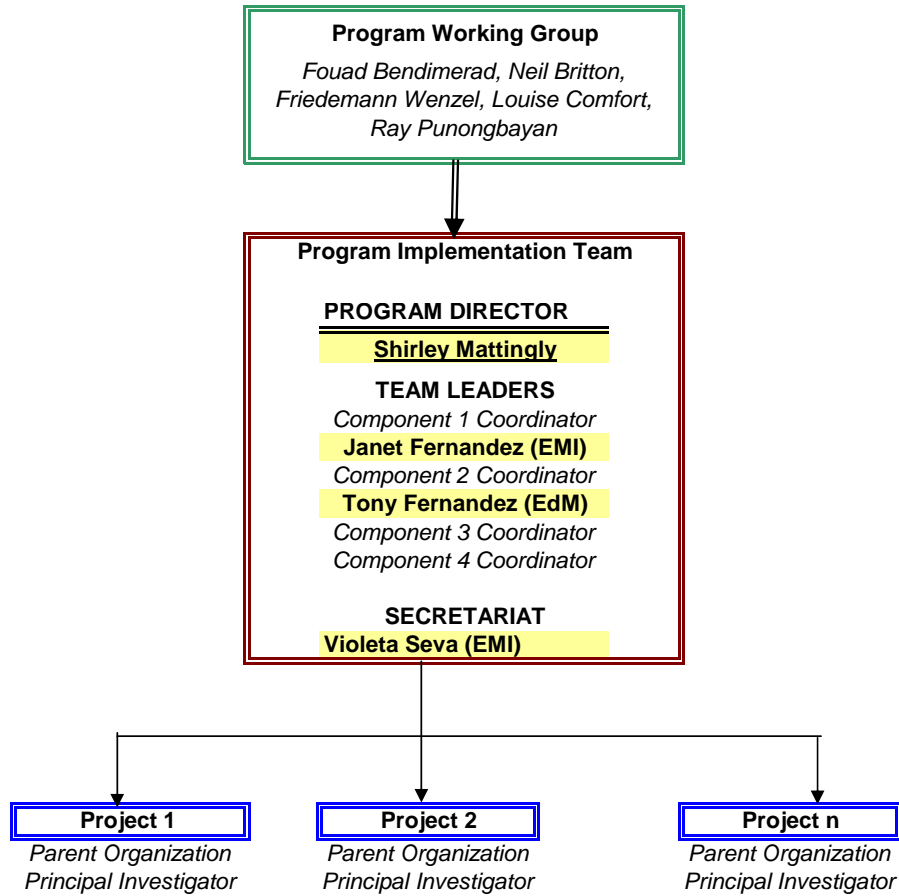
In the third phase of the program, adjustments will be made from lessons learned in Phase 2 and the program will be deployed in several other cities. Program adjustments may include corrections to the tools and methods, as well as to the approach for implementing the DRMMP components. Prior to full deployment of the program, a workshop will be held to provide an opportunity for learning, for dissemination of the knowledge base accumulated in previous phases, and for collecting input and feedback. The workshop will also serve as an orientation session for the new cities that would be engaged into the program.

The expected outputs of this phase are the development of components of several cities' DRMMP and initial steps toward their implementation.

VII. PROGRAM ORGANIZATION

The program organization chart is shown in Figure 2 below.

Figure 2. Program Organization Chart



The roles and responsibilities of the Program participants are as follows:

- *Program Working Group (PWG)* - management oversight and performance measurement
- *Program Director (PD)* - management and implementation of all aspects and day-to-day activities of the program. The PD will be named by the EMI Board of Trustees in consultation with program partners
- *Secretariat* - supports the *Program Director*
- *Component Coordinator* – leads the development and implementation of each of the four program components of the 3cd Program
- *Program Implementation Team* - integrates the outputs of the activities and projects

Activities will be carried out through self-sufficient yet complementary projects, each of which will have a Parent Organization and a Principal Investigator.

- *Parent Organization* - funds and supports the management and implementation of a project, which is part of component.
- *Principal Investigator (PI)* - in charge of a project. A PI can serve as a Component Coordinator.

VIII. BUDGET AND FUNDING

A preliminary budget estimate and expenditure schedule for the program is shown below. The total program cost is estimated, for planning purposes, at \$5.6 million, not including some in-kind costs that will be absorbed by parent organizations. Each partnering institution is expected to contribute to the funding of the program by taking direct funding responsibility of one or several projects in which it has an interest. This funding can be internal (i.e., the parent organizations directly finances the cost of labor, material and expenses related to the project) or external (i.e., the parent organization provides funds to EMI which will staff and undertake the project on behalf of the parent organization).

Parent organizations also participate in the funding of program management costs and program expenses in proportion to their participation. The percent of participation is expected to follow a sliding scale where a higher “overhead” rate is charged to smaller projects. In proportion, smaller projects will have a greater benefit from the collective contribution of the partners than larger ones. To reduce the financial burden on its partners, EMI will seek separate sources of funding to support some of the project management activities. Partners are expected to join in identifying external sources of funding and in developing joint proposals to ensure viability and long-term financial sustainability of the 3cd Program.

Table 1. Estimated Total Budget by Activity

COMPONENT 1 - Analysis of Knowledge and Practice		\$ 800,000
COMPONENT 2 - Training and Institutional Strengthening	Phase 1	\$ 400,000
	Phases 2 & 3	\$ 600,000
COMPONENT 3 - Disaster Risk Assessment	Phase 1	\$ 300,000
	Phases 2 & 3	\$ 400,000
COMPONENT 4 - Development of DRMMP		\$ 1,400,000
Research and Development Studies		\$ 1,000,000
Program Management and Integration Costs		\$ 500,000
Program Expenses		\$ 200,000
Total Estimated Budget		\$ 5,600,000

Note: More detailed cost estimates, totaling US\$831,250 and US\$450,000, have been developed for Phase 1 Components 1 and 2, respectively. See Appendix B.

Table 2. Estimated Distribution of Program Budget by Phase

PHASE 0	Organizational Phase	\$ 100,000
PHASE 1	Practice Assessment Study and Tools Development	\$ 1,900,000
PHASE 2	Program Implementation Testing	\$ 1,400,000
PHASE 3	Program Deployment	\$ 2,200,000
Total		\$ 5,600,000

Table 3. Expected Yearly Expenditures

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
\$ 700,000	\$ 800,000	\$ 1,200,000	\$ 1,300,000	\$ 900,000	\$ 700,000	\$ 5,600,000

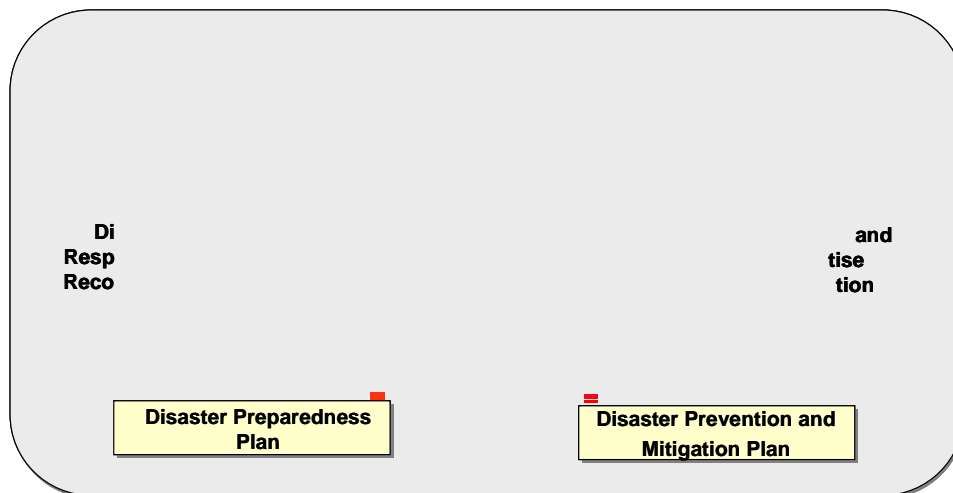
APPENDIX A

The DRMMP Concept

The *disaster risk management master plan* (DRMMP) incorporates components of disaster risk assessment, prevention and risk reduction, preparedness, response, recovery and knowledge acquisition into a comprehensive disaster risk management plan as shown in Figure 1. The DRMMP offers an integrated and comprehensive way for local governments to plan and manage risk. Megacities are familiar with the master plan (or comprehensive plan) process, which they use in particular in urban development and transportation planning, etc. Master plans are also used to understand budget requirements and to develop financial strategies and allocate resources for funding public capital projects. Hence, the DRMMP can lead to institutionalization of disaster risk management in local government practices. The DRMMP is the key deliverable around which the 3cd Program is organized.

The DRMMP will consist of components, each including a complementary set of activities that together constitute a comprehensive package of interventions. This “menu” type approach provides flexibility in selecting activities that are applicable and feasible at the local level, and in identifying other activities that would require involvement from the regional or central governments. This flexibility is important because several disaster risk management matters are not under the jurisdiction of local governments and need to be dealt with in cooperation with central government institutions. Local governments can design the most appropriate DRMMP based on their own conditions and in recognition of their own constraints. The 3cd Program provides the guidance and the structure for implementing a sustainable disaster risk management agenda at the local level.

Figure 1: Components of a Disaster Risk Management Master Plan (DRMMP)



APPENDIX B

Detailed Tasks and Budget for Phase 1 (Components 1 and 2)

Component 1. Assessment of Current Knowledge and Practice

This component consists of undertaking an assessment of the current practice of disaster risk management in complex urban areas (i.e., megacities) of developing countries and identifying gaps and users' needs. Documentation developed in this project will be widely distributed among practitioners, researchers, and policy makers in developing countries. This component provides the basis for EMI to implement its 3cd Program, a long-term capacity and vulnerability reduction program for megacities in the developing world.

Objectives and Deliverables

This component will achieve the following specific objectives of the 3cd Program

- Understand the structures of local institutions involved in disaster risk management functions (i.e., urban planning, public works, housing, public health, social welfare, and emergency management), their role and their inter-relationships with local and central governmental agencies in charge of disaster risk management.
- Understand the organizational and institutional strengths and weaknesses, and identify the gaps in the planning and delivery of disaster risk management functions within local governments and local institutions. Document the role of NGO's, CBO's and other stakeholders in local disaster management efforts.
- Develop an electronic *Knowledge Base* that compiles current initiatives, case studies and methods that encompass the practice of disaster risk management in major metropolises. This Knowledge Base is intended to serve as a reference source in the field.
- Develop a *Manual of Sound Practices* that can be used as a guide for assessing, managing and reducing risk to complex urban areas, and a related strategy for implementation.
- Develop an *Implementation Strategy Manual* that defines an approach for improving current practice in megacities in developing countries and that can be used in future intervention.
- Disseminate developed documentation to practitioners, researchers, and public officials.

Scope of Work

The scope of Component 1 will include the following tasks:

1. Selection of the megacities and initial consultation with local investigators, local government officials and identification of other stakeholders. Development of a Project Team composed of a program director, component leaders, local investigators (one in each of the five cities), and Project Review Group (PRG) consisting of experts in the field. Members of the PRG are drawn from EMI's Scientific Advisory Board and other partner institutions.

2. Literature search to collect information published in previous studies, conferences, seminars, including work done by governmental and non-governmental organizations.
3. Research and analytical work to develop a procedure for collecting and cataloguing information, identify case studies, determine organizations to be contacted, stakeholders, and developing a method for evaluation and analysis. Hold a project launch and orientation workshop. Hold a field workshop in each of the cities involved the study to engage city leadership and city managers in the study. This workshop will also identify stakeholders that need to be consulted.
4. Undertake field work with local and central government offices and departments associated with disaster management practice (e.g., emergency management, urban planning, social welfare, public works, etc.), and consult with other stakeholders.
5. Perform evaluation, synthesize and integration of data. Develop draft Knowledge Base and draft Disaster Management Sound Practice Manual.
6. Undertake review by Project Review Group.
7. Complete version 1 of Knowledge Base and of Sound Practice Manual and of Implementation Strategy Manual. Disseminate documentation.

Cost Estimate

- The total cost of Component 1, Phase 1 of the 3cd Program is estimated at \$US831,250 (as detailed in Table C.1 below).

Table C. 1. Cost Details (in \$US) for Component 1, Phase 1

ID	Item	Required
1	Funding for a maximum of 10 subject specialists from developing countries, one from each of 10 cities to serve as principal investigators in undertaking investigation in their own countries	\$150,000
2	Funding for Component Coordinator who will supervise the investigation for a period of 15 months	\$100,000
3.	Funding for Program Director who will coordinate all activities and be responsible for program management and program performance for a period of 15 months	\$60,000
4.	Funding for two researchers who will assist Component Coordinator for a period of 15 months	\$30,000
5.	Compensation for Program Working Group (5 people)	\$50,000
6.	Cost for running workshops (5 city workshop and 2 program coordination workshops)	\$175,000
7	Cost for holding working sessions with PGW (2 sessions)	\$60,000
8	Hardware and software costs, including computers, laptops, and other material used for presentations as well as communication media	\$10,000

9	Publication and dissemination costs	\$30,000
	Total Direct Cost	\$665,000
10	Secretarial and administrative costs (15% of direct cost)	\$99,750
11	Overhead (10% of direct cost)	\$66,500
	Total Component Cost	\$831,250

Implementation Approach

In this first phase of the 3cd Program, an investigation is undertaken to collect, synthesize and assess current disaster risk management practice, and establish the gaps in knowledge and practice in as many as ten megacities that currently partner with EMI in its Cluster Cities Project (Refer to EMI website for more information on Cluster Cities Project). This investigation is performed by working directly with the authorities of these megacities. EMI has worked with leadership of more than a dozen megacities from around the world for many years. It also has strong relationships with researchers, practitioners and disaster risk management specialists in these cities. The methodology for undertaking these investigations will be developed by a team of international experts with participation from city policy makers. Data collection and synthesis will be undertaken by a local researcher, who will be working with an implementation team. Several workshops are planned, including at least one workshop by each city to engage the city's authorities and managers into the process of information gathering and synthesis, and to connect with other stakeholders that participate in the disaster risk management practice for the city. It is also expected that representatives from the central authorities will be participating in these workshops.

Component 2. Training and Institutional Strengthening

This component consists of developing and beta testing a specialized training program in urban disaster risk management for local officials and local professionals and practitioners involved in disaster risk reduction, including urban planners, building code officials, construction professionals, public works engineers, emergency managers, health safety specialists and social workers. The training will support the development and implementation of a Disaster Risk Management Master Plan for large metropolises in developing countries.

Objectives and Deliverables

This component will aim to achieve the following specific objectives of Phase 1 of the 3cd Program:

- Develop and test a specialized training program for the management of disaster risk associated with megacities.
- Build institutional capacity and improve current practice in disaster risk management in developing countries.
- Prepare cities for the implementation of Disaster Risk Management Master Plan.

- Enable EMI to implement its 3cd Program, which is a long term mechanism for building capacity and reducing vulnerability of megacities in developing countries to earthquakes and other disasters.

The deliverables of this component include:

1. Draft training material including a training manual and associated training delivery materials.
2. An *Implementation Strategy Guidebook*, including a work plan for implementation of the training program in subsequent phases of the 3cd Program.
3. Report summarizing existing urban vulnerability training programs and goals and objectives of proposed training.

Scope

The scope of this component includes the following tasks:

- Investigate and catalog existing disaster risk management training programs aimed at urban disaster risk reduction. Identify gaps and needs.
- Develop a specialized curriculum for training local officials as well as local professionals and practitioners in disaster risk management, including techniques for disaster risk assessment, scenario analyses, disaster and emergency management, disaster preparedness and disaster risk reduction. The methodology will be designed to apply to all disasters but the application would focus on the earthquake peril, which is the natural hazard that provides the most challenges for management and mitigation.
- Prepare training documentation including a training manual and related visuals, multi-media material, brochures, case studies, and field trip agenda.
- Engage a training resource group to help in the development, review and implementation of the training curriculum.
- Develop a strategy guidebook for the implementation of the training programs. This task will include identification and consultation with end-users.
- Test the training agenda in one megacity (the city will be selected among EMI city partners.)
- Prepare final training delivery material for implementation in several megacities in subsequent phases of the program.

Cost Estimate

- The total cost of Component 2 in Phase 1 is estimated at \$450,000 (as detailed in Table C.2 below).

Table C2. Cost Details

ID	Item	Required
1.	Funding for Component Coordinator who will supervise and lead the component and develop training materials for a period of 16 months	\$120,000
2.	Funding for Program Director who will coordinate all activities and be responsible for program integration, management and performance for a period of 15 months	\$40,000
3.	Research and field work including part time funding for one researcher who will assist Component Coordinator for a period of 15 months	\$50,000
4.	Compensation for Training Resource Group (3 people)	\$30,000
5.	Development of draft training material including manuals, visuals, multi-media, etc.	\$40,000
6.	Cost for Review Workshop	\$30,000
6.	Hardware and software costs, including computers, laptops, and other material used for presentations as well as communication media	\$10,000
7.	Testing of training program in one city including travel costs	\$40,000
	Total Direct Cost	\$360,000
8.	Secretarial and administrative costs (15% of direct cost)	\$54,000
9.	Overhead (10% of direct cost)	\$36,000
	Total Component Cost, Phase 1	\$450,000

Implementation Approach

The training will be administered in cooperation with EMI's city partners and partnering institutions in developing countries and currently participating in EMI's Cluster Cities Project (Refer to the Cluster Cities Project documentation on EMI's website). Other cities could also participate.

APPENDIX C

Research and Development Studies to Support the 3cd Program

Research Area 1: Methodological Framework to Support Component 1 (Analysis of Knowledge and Practice)

The methodological framework being proposed for Component 1 is based on recent research on the analysis of disaster risk. Several approaches are being considered. One combines Morphological Analysis with Analytic Hierarchy Process to integrate quantitative technical and economic factors within the broader context of social, political, organizational, and ethical considerations. This approach is used by the Swedish Defence Research Academy. A second approach is the Information and Indicators Project for Disaster Risk Management that is being supported by the Inter-American Development Bank, with participation and support from the World Bank and the United Nations Development Programme. This approach combines nonlinear analysis of disaster risk over time, measuring the rate of change in disaster risk over time, using a range of economic, social, organizational, and cultural indicators, as well as assessment of the built infrastructure in regions exposed to risk. Both methods will be considered in terms of the validity and robustness of disaster risk information they produce for practicing managers. The method most appropriate to the types of risk exposure and access to information available at the local level will be fitted to the context of each megacity included in the study. The method selected will include computational modeling of disaster risk to provide graphic display of changing risk under different economic, social, engineered, and seismological conditions.

Research Area 2: Development of Tools and Methods for Disaster Risk Assessment

This research area consists of developing a public domain, open-architecture disaster risk assessment technology that can be used at the level of each participating partner city in the design and implementation of scenario studies. The technology would be GIS-based and would allow participating cities to collect and consolidate their databases on buildings, infrastructure, critical facilities, population, and geophysical conditions. The disaster risk assessment technology will be used by city governments to run scenarios and to understand the physical and institutional vulnerabilities associated with their cities. The methods behind the technology will be based on the sound practice in disaster assessment and will be fully documented. These methods include hazard analysis, vulnerability analysis, damage and loss analysis, and functional loss analysis. Included in this research area is the development of a standardized methodology for assessing vulnerability parameters of buildings and infrastructure and for evaluating the fragility of socio-institutional systems.

Research Area 3: Methods for Improving Standards and Practices for Construction and Land-Use Planning

This research area centers on developing tools and methods for improving two key components of mitigation. The first relates to the investigation and development of the schemes of implementation of competent construction standards that improve performance of buildings

(both new and existing); the second relates to the investigation and development of mechanisms for risk-based urban planning. The goal is to develop a set of international standards for sound practices in the field. It includes investigating approaches for risk reduction regarding vernacular construction that is typically built without a permit or involvement from construction design specialists. Both institutional and non-institutional construction should be addressed. Defining mechanisms for building code implementation, professional skills enhancement, and community involvement in urban planning is an important component of this activity. The methods developed will be incorporated in the design of each city's DRMMP.

Research Area 4: Development of Methods to Build a Culture of Prevention

This research area addresses the socio-political aspects of urban vulnerability reduction. It involves investigating attitudes towards risk, lack of community planning, lack of citizen's input, and non-involvement of community and stakeholders in disaster mitigation processes. A large component of this research is related to collecting, analyzing and synthesizing past and on-going experiences and understanding the transferability of these experiences depending on cultural backgrounds, historical context, and societal structures. These experiences include school education programs, community involvement programs, business involvement programs and professional involvement programs. This study area also includes investigations of coalition building processes and the effectiveness of coalitions that involve community-based organization (CBO's), NGO's and governmental organizations. These investigations will seek to identify effective roles for CBO's, NGO's, and the research community, as well as understand the role of the media in education and awareness rising. They will also assess public perceptions of risk, design mechanisms for community involvement, and identify what works and what does not. Methods will be designed to build a culture of prevention in the context of complex urban structures. These methods will help to define standards for sound practices and a body of knowledge that would serve as a reference in the field. The knowledge and findings from this study will feed into elements of each city's DRMMP.