

Transfer of Disaster Risk Reduction Lessons: Disaster Risk Management Master Planning in Asian Megacities

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Abstract

This paper introduces a successful planning model and methodology for mainstreaming disaster risk management in megacities that has been under development since 2000 by the Earthquakes and Megacities Initiative (EMI) with global and city partners. Metro Manila, Philippines, with a population of 10 million, is the first city to initiate implementation of the *Disaster Risk Management Master Plan* model through the collaboration of the Metropolitan Manila Development Authority, the Philippine Institute of Volcanology and Seismology as the Local Investigator, and the cities of Quezon, Makati, and Marikina in partnership with EMI's international Implementation Team and sponsors.

The main objective of the Earthquake and Megacities Initiative is to empower local governments, local institutions, and local communities to implement disaster risk reduction. For this purpose, EMI has developed the *Cross-Cutting Capacity Development Program* as a methodology for implementation of disaster risk reduction at the local level. The 3rd Program's four components are: 1) Analysis of Knowledge and Practice; 2) Assessment of Disaster Risk; 3) Development of a citywide, consensus *Disaster Risk Management Master Plan*; and 4) Training and Institutional Strengthening. As part of the implementation methodology, EMI and its partners have created a comprehensive package of related and relevant training tools and products, known as MEGA-Learn.

The planning model, implementation methodology, and training tools have been developed for implementation by disaster researchers, city administrators, and local stakeholders in megacities and urban centers at risk in order to sustain disaster risk management implementation in megacities.

Keywords: *Disaster Risk Management, Urban Risk, Megacity, Disaster Planning, Earthquakes*

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1. Introduction

This paper introduces the *Disaster Risk Management Master Plan* model and the *Cross-Cutting Capacity Development Program* implementation methodology to mainstream disaster risk management in megacities. The 2007 United Nations *Global Platform for Disaster Reduction* has recognized urban risk management as an issue that requires immediate attention from governments and international institutions [1].

The planning model and methodology have been under development since 2000 by the Earthquakes and Megacities Initiative (EMI), Manila, Philippines, an international not-for-profit scientific organization, with global and city partners, and has been applied in Metro Manila, Philippines, a city of 10 million, 2004 – 2007. Successful prototypes are also underway with stakeholders and local investigators in Kathmandu, Nepal, 2005-2007 and Amman, Jordan, 2007-2008. As part of the implementation methodology, EMI and its partners have created a comprehensive package of related and relevant training tools and products, known as MEGA-Learn [2]. The planning model, implementation methodology, and training tools have been developed for implementation by disaster researchers, city administrators, and local stakeholders in megacities and urban centers at risk in order to sustain disaster risk management implementation in megacities.

2. The Cross-Cutting Capacity Development Program and Its Four Components

The main objective of the Earthquake and Megacities Initiative is to empower local governments, local institutions, and local communities to implement disaster risk reduction. For this purpose, EMI has developed the *Cross-Cutting Capacity Development Program (3cd Program)* [3] as a model for implementation of disaster risk reduction at the local level. The 3cd Program's four components are:

1. **Component 1: Analysis of Knowledge and Practice.** Create a Disaster Risk Management City Profile and document Sound Practices in order to understand the specific city context;
2. **Component 2: Assessment of Disaster Risk** in order to communicate risk to city stakeholders;
3. **Component 3: Development of a citywide, consensus *Disaster Risk Management Master Plan*** as the framework for managing risk; and
4. **Component 4: Training and Institutional Strengthening.** Develop training tools and products for city managers to ensure knowledge building, capacity development, institutional strengthening, and sustainability to support the implementation of a *Disaster Risk Management Master Plan*.

Each of the four 3cd Program components has a coordinator. Together, these component coordinators comprise the *3cd Program Implementation Team* to manage all the corresponding activities and work for accomplishing specific goals.

3. Top Ten Concerns for Risk Reduction in Megacities as Basis for Model

Between May and August 2004, the 3cd Program Implementation Team carried out a two-part survey related to disaster risk management organization and delivery in 20 megacities around the world [4]. The input from megacity administrators has led to the development of the *Disaster Risk Management Master Plan* model. City administrators identified the following ten common issues that need to be addressed to improve risk reduction in megacities in the developing world:

1. Requirement to reverse the rapid expansion of haphazard and illegal construction associated with the growing number of informal settlements;
2. Lack of institutional coordination at the local level, within civil society, and with central government authorities;
3. Weak legal frameworks within megacities to implement and enforce risk reduction measures;
4. Need to improve emergency response mechanisms and institutions;
5. Need to focus on prevention and mitigation efforts in addition to response;
6. Lack of modern building codes and enforcement regulations leading to the current state of vulnerable urban environments;
7. Need to implement disaster risk management rooted at the local level;
8. Lack of risk transfer mechanisms such as insurance;
9. Lack of funding and resource allocations to develop risk reduction mechanisms; and
10. Requirement for improved education, information, and risk communication.

4. Lesson Learned from the Megacity Planning Experience

In addition to megacity feedback surveyed above, the lesson learned from the EMI megacity implementation experience in Metro Manila is that politically willing local governments feel that – “*YES, disaster risk reduction is important*” but, “*What it it and how do I do it?*” Most often local governments do not understand their city-specific disaster risk management “*options*”, nor do they comprehend the “*process*” for successfully implementing these options. The bottom line is that across the spectrum of local government duties, disaster risk management is not very well understood, is difficult to implement, and is sometimes a risky proposition for local governments. However, we have no choice but to work with local governments and at the local government level because disaster risk management is a local issue.

5. 3cd Program Component 1: Analysis of Knowledge and Practice to Create a Disaster Risk Management City Profile

Figure 1 identifies resource characteristics present in most megacities that should be embraced to mainstream disaster risk management planning. These resources and relationships are revealed through conduct of Component 1, above, through interviews and input to complete a Disaster Risk Management City Profile and to collect Sound Practices [5]. Megacities are unique from smaller cities in that most megacities house the central (national) government and corresponding resources in terms of legal and institutional framework, national policy and regulations, as well as resources and oversight for disaster risk management. At the same time, necessary and complimentary components of civil society are often located in megacities, such as academic institutions, non-governmental organizations, and community-based organizations, as well as businesses, professional organizations, and the major media outlets. The central authority and civil society resources are available to supplement local authorities tasked with carrying out disaster risk reduction functions of response, mitigation, preparedness, and recovery.

6. 3cd Program Component 2: Disaster Risk Assessment & Risk Communication

Concurrent with development of the Metro Manila City Profile [6], the Project Implementation Team has utilized the available comprehensive earthquake risk

assessment from the *Metro Manila Earthquake Impact Reduction Study*, conducted by the Japan International Cooperation Agency, 2002-2004 [7]. The Pacific Disaster Center, in partnership with the Program Implementation Team, has developed and implemented the Metro Manila Internet Map Viewer which interactively displays earthquake scenarios from the risk assessment, above, with citywide GIS data via the Internet for land use decision making to support risk reduction [8].

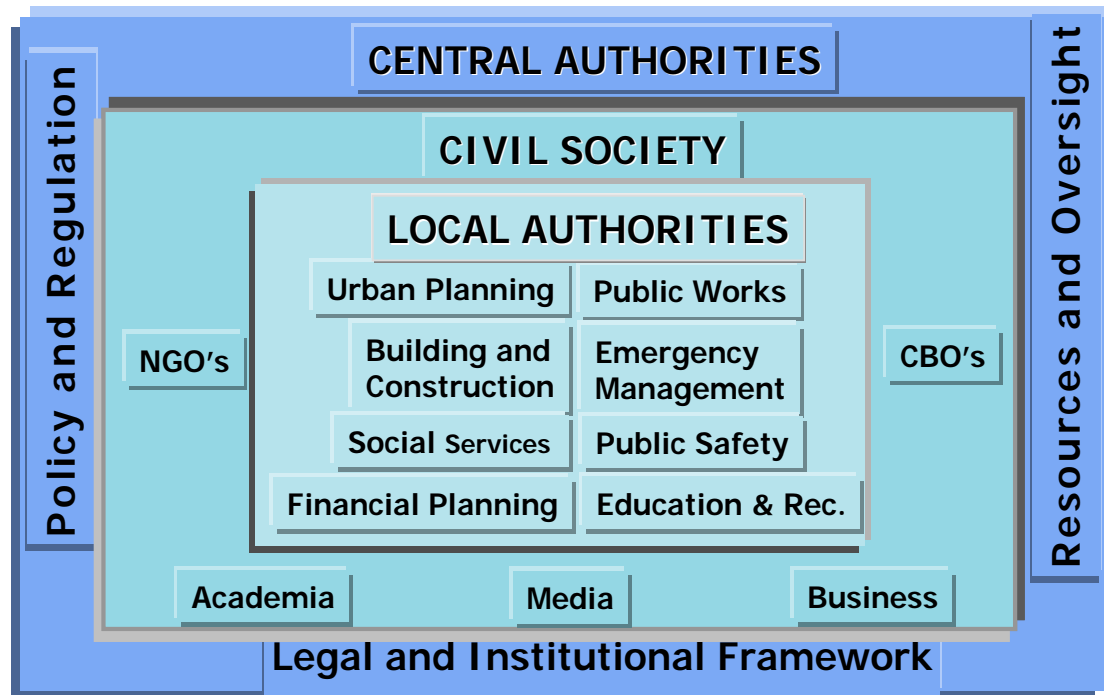


Figure 1. Megacity resources usually available for disaster risk reduction planning. The *Disaster Risk Management Master Plan* model takes advantage of central authority and civil society resources to augment local authorities in order to mainstream disaster risk reduction.

7. 3cd Program Component 3: *Disaster Risk Management Master Plan Model*

The Earthquakes and Megacities Initiative, has developed an implementation model for megacity disaster risk management through a *Disaster Risk Management Master Plan* model and has partnered with several organization to implement it as part of EMI's 3cd Program. These include: the Pacific Disaster Center, Hawaii, USA, Research Center for Urban Safety and Security, Kobe University, Japan, the Earthquake Disaster Mitigation Research Center, Kobe, Japan, the United Nations Development Program, Geneva, the World Bank Institute, Washington, D. C., and Provention Consortium, Geneva.

The overall objective of this *Disaster Risk Management Master Plan* model and implementation process is to achieve a sound institutional and legal framework for an effective disaster risk management system, and the full integration of disaster risk management into the ongoing governance, business, and economic processes in the city. Empowering and institutionalizing disaster risk management into complex urban environments is a very difficult, complex, and ambitious challenge!

Figure 2 describes the plan components of the *Disaster Risk Management Master Plan* as well as integrates the four implementation strategies of *Knowledge and Resources, Action Plans, Institutional Commitment and Social Participation* leading

to *Sustained Action*. This model is based on successful master planning and lessons learned from the Istanbul, Turkey experience, 2000-2006, following the devastating 1999 Izmit, Turkey earthquake, magnitude 7.4, that killed over 17,000 people in cities east of Istanbul and leaving nearly 500,000 people homeless [9].



Figure 2. Disaster Risk Management Master Plan Model. The model incorporates disaster risk management plan components with implementation process elements. EMI's model has been adopted by United Nations Development Programme and promoted by the United Nations International Strategy for Disaster Reduction as an effective tool for advancing disaster risk reduction.

8. 3cd Program Component 4: Training and Institutional Strengthening at the Local Level

The Disaster Risk Management Master Plan components, in Figure 2 above, encompass disaster risk management functions as well as education and capacity building programs through a series of established training program modules that lead to city certified disaster managers. EMI has published and conducts these training programs, known as the MEGA-Learn program, both on-site and on-line in partnership with the World Bank Institute [10].

9. Implementation Methodology: 3cd Program Structure in Metro Manila

The four Master Plan Components in Figure 2, above, are implemented through 1) an *Action Plan* developed by and for the local stakeholder institutions based on 2) *Knowledge and Resources* from the risk assessment and City Profile, 3) *Institutional Commitment* by the central and local authorities, and 4) *Social Participation* coordinated and led by the Local Investigator.

Metro Manila, Philippines is the first city to initiate implementation of its *Disaster Risk Management Master Plan* through the collaboration of the Metropolitan Manila Development Authority, the Philippine Institute of Volcanology and Seismology as the Local Investigator for the Program Implementation Team, and the cities of Quezon, Makati and Marikina with EMI's 3cd Program Implementation Team and partners and sponsors, listed above in Section 7.

A Local Investigator represents the core of the 3cd Program in the city. The Local Investigator is responsible for coordinating all local activities of the project and serves as the liaison between the city and its stakeholders and the Program Implementation Team and helps to manage execution of a mutually agreeable scope of work.

A multidisciplinary group of city stakeholders serves as a Local Advisory Group, to assist the Local Investigator in some of the following areas: a) hazard evaluation and risk assessment, b) Social sciences, c) economy and finance, d) urban planning, and e) management.

To approach megacity complexities, the 3cd Program has defined a pilot city approach. Three cities out of seventeen comprising Metro Manila have joined the program in an effort that permits understanding the inter-city linkages, a range of common issues and sound practices. Six Stakeholder Working Groups have been established to accomplish specific tasks and products from a consensus 10-point Action Plan defined by the Master Plan. The organization for this partnership approach is shown in **Figure 3**. Manila governmental and nongovernmental resource organizations, identified in Figure 1 and described in Component 1, above, have been incorporated into the planning process through Stakeholder Working Groups defined to focus on accomplishing specific action plans for 1) Information and Communications Technology, 2) Land-use Planning, 3) Professional and Construction Industry, 4) Training Needs, 5) Legal and Institutional Framework, and 6) Manila Risk Indicators.

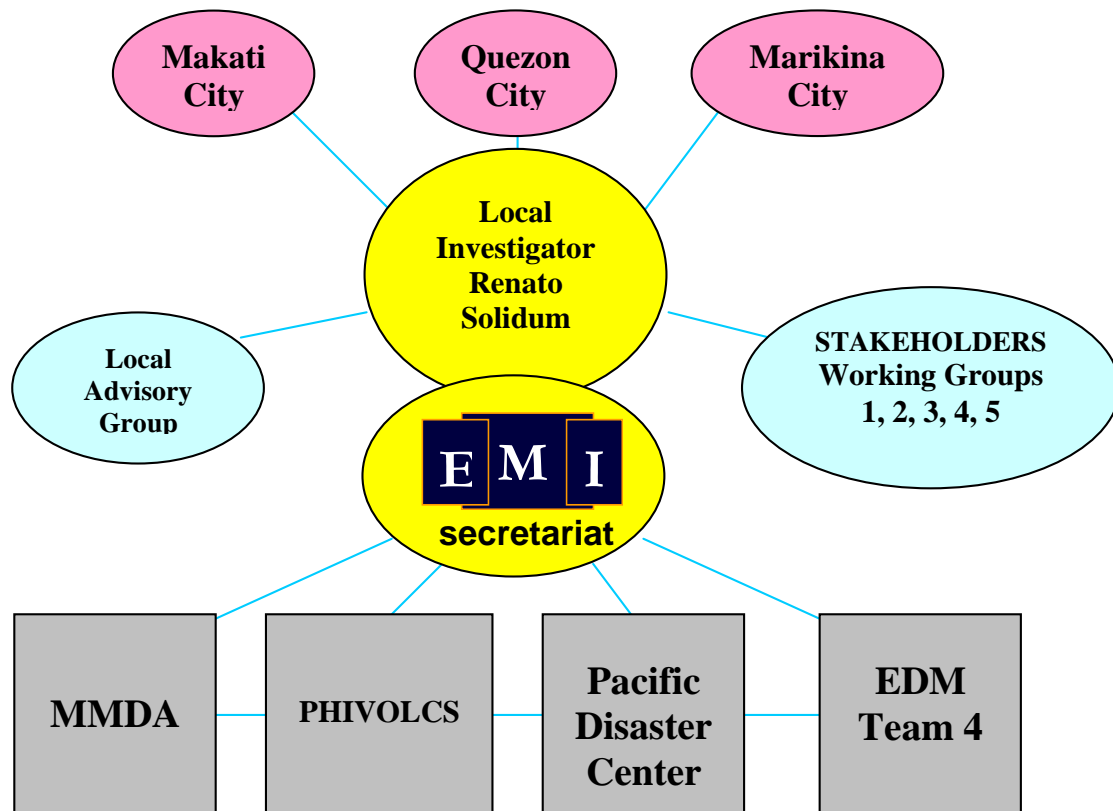


Figure 3. Project Organization for the Disaster Risk Management Master Plan Implementation in Metro Manila, Philippines, 2004-2007.

The model has been implemented in Metro Manila and tested in Kathmandu by the 3cd Program Implementation Team, local investigator, pilot cities, and stakeholder working groups through the following steps:

1. Perform a diagnosis of the current disaster risk management organization and assessing gaps and needs.
2. Identify key local players and designating a Local Investigator.

3. Select pilot cities to better realize megacity complexities.
4. Engage city-wide stakeholders' participation to build consensus around a strategy to advance risk reduction.
5. Produce a set of action items to progressively implement the strategy outlined in the *Disaster Risk Management Master Plan*.
6. Establish Stakeholder Working Groups to carry out specific prioritized activities, provide cross-sectoral support, and promote ownership by the local organizations.
7. Conduct trainings, workshops, seminars and small group discussions to build capacity and generate a support base.
8. Develop an online *Megacities Disaster Risk Management Knowledgebase* providing access to global megacity experiences [11].
9. Implement an internet-accessible map viewer for the entire Metro Manila area to aid and to motivate risk reduction action [8]
10. Design a set of risk indicators to measure progress and facilitate communication with local authorities and stakeholders [12].
11. Complete and disseminate products and training tools with the intent of replicating successful disaster risk management planning processes in megacities.

Based on the findings and lessons learned from Manila's initial implementation process, this leading team is expected to take an active role to progressively promote the necessary changes in the culture, organization and management of earthquakes and other natural and manmade risks.

10. Results and Conclusions

The *Disaster Risk Management Master Plan* and implementation methodology provides an initial experiment for a comprehensive, yet strategic, approach to implementing disaster risk reduction in megacities. A stakeholders' evaluation of the Metro Manila prototype experience [13, 14] has indicated a keen interest and involvement from the stakeholders, creating a positive dynamic to engage stakeholders and commit institutions to the goal of changing practices and influencing policy. With the *Disaster Risk Management Master Plan* approach validated, the next phase is to change practices with a focus on land-use planning and policy, building code implementation, and capacity development to sustain these positive changes.

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Local Investigator: Dr. Renato Solidum, Jr., Philippines Institute of Volcanology and Seismology, and Metropolitan Manila Development Agency.

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