State-of-the-Practice Report on Urban Disaster Risk Management

EMI Open-File Report
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Many thanks to all those who provided their input and comments. Additional comments to the author are most welcome.

For related materials on urban DRM, please visit the EMI website at www.emi-megacities.org.
1.0 FUNDAMENTALS OF DISASTER RISK MANAGEMENT

Disaster risk management (DRM) is a set of processes, planning actions, policies and legal and institutional arrangements aimed at managing, and eventually reducing the effects of hazardous events (natural or man-made) on the human and physical assets of a community, and minimizing the impacts of these hazards on the delivery of essential services to the population. These policies and actions take place at various levels often at the community level (e.g., neighborhoods, associations, etc) to escalating levels of government (district, municipal, provincial, and central). They can be formal or informal, public or private; however, their effectiveness is highly correlated to the level of coordination that takes place during the course of implementation. DRM should also be recognized as a professional practice, requiring its own processes, trained professionals, experience and culture. In developing countries, DRM can be considered as an emerging practice, often in need of experience, investment and maturity which will take time to be operational and effective.

The protection of assets (human, institutional and material) and services establishes the link between DRM and development. As a community takes measures to make its built environment and its processes for management of resources and delivery of services (i.e., transportation, sanitation, energy, health, education, etc) resilient to external damaging hazards, it is accomplishing disaster risk reduction (DRR). The ensemble of policy and actions adopted by that community and its governing institutions (public or private) define its DRM practice. Thus, in its concept, DRM practice is pro-active (i.e., ex-ante) as opposed to disaster response and rehabilitation/reconstruction, which are passive or response-oriented (i.e., post-ante). A simple schematic representation of DRM is shown in Figure 1 above. The figure indicates that most local authorities have yet to make the shift from post-event response to pro-active disaster risk reduction. It also indicates that response planning should be integrated as another key activity of DRM.

Mainstreaming DRR into formal development processes

The formal course of development of a country is regulated by policy and planning processes such as development planning, land-use planning, natural resource management planning, poverty reduction planning, etc. This formal course of development is an integral part of the governance structure of a country. The private sector oftentimes recognizes its interests within the formal process and directly or indirectly exerts its influence. Institutions (public or private) often react to the present and future needs of individuals and households to make necessary adjustments in their institutional development processes. However, the formal process of development is not often effective or capable to respond to the demand. The rapid urbanization that has taken place in most developing countries within the last several decades has often overwhelmed the formal processes of development, especially in and around cities, and is considered to be one of the main causes of increasing vulnerabilities of urban areas to extreme hazards. While the process of urban development is quite complex and sometimes resorts to ad-hoc action, the link of DRM to development cannot be incidental. Independently of where it takes place (community, local, provincial or national), DRM practices are more sustainable and more efficient in the long term when they are explicitly integrated with formal development and institutional
processes. DRM practices should aim at strengthening the formal course of development and not to further weaken it in order to reduce human, physical and institutional vulnerability to natural hazards. The introduction of DRM as an integrated element of the core functions and operations of government establishes the critical link to governance. The aim of reaching the integration of DRM in institutional planning, development, functional and operational processes is referred to as “mainstreaming”. Advances in disaster risk reduction (DRR) are directly linked to the ability of institution to mainstream DRR concepts and practices.

Developmental processes and program of government typically get implemented at the local level. One must thus recognize the key role of local government and local institutions in accomplishing the mainstreaming process. A country cannot reach an effective level of disaster risk reduction if its local processes and capacities for integrating DRM within its developmental processes are weak or uncoordinated. Decentralization of planning, decision making and resources are strong indicators of the potential for mainstreaming.

There are strong complementarities between humanitarian action and DRM. Both recognize the need to influence governance; importance of participatory processes and social mobilization. Humanitarian action’s primary goal is the protection and enhancement of livelihoods and the betterment of the daily living conditions of individuals and communities. On the other hand, DRM’s main goal is the protection of assets (human and physical) and services from major external shocks such as natural hazards. Humanitarian strategies have a strong base in community-based actions and have influenced DRM practice. As a result, a significant percentage of the investment in DRM has been in community based approaches.

Following the adoption of the Hyogo Framework for Action (HFA), a stronger emphasis in institutionally based approaches at the policy making level has emerged. In particular, HFA’s five action-oriented axes are indicated as strategies to guide governments in terms of mainstreaming DRM in their development processes. However, coming on the two-year anniversary of the HFA, the general consensus is that the integration of DRM in formal and informal developmental processes has been slow. One of the reasons is that the processes of development are complex and vary from country to country. Hence, the current tools and methods are not very efficient in accomplishing the process of mainstreaming. For example, participatory processes (such as community-based approaches) are seldom anchored in formal institutional arrangements, policies, laws, regulations and practices that control development. As a result their long term influence on development is debatable. In contrast, the experience from the environmental field can be very relevant, as in most countries, environmental protection and adaptation is accepted as an important component of developmental planning.

Post-event disaster response, recovery and reconstruction offer opportunities for improving DRM practices. However, that by itself is insufficient to effectively mainstream DRM. Waiting for a disaster to strike before undertaking DRM has long been recognized as a flawed policy.

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1 Most funding organizations still have their DRM functions within their humanitarian department.
It remains that an understanding of the linkages and differences between DRM and humanitarian practices and DRM and disaster response planning could lead to more effective strategies in mainstreaming DRM within governance functions. Further, DRM practice is in need of strategies, planning processes and implementation methodologies that are more explicitly correlated to developmental processes.

2.0 HOW IS DRR ACCOMPLISHED?

DRR is an overlap between three broad actions:

1. An analysis of the risk elements. This starts with an assessment of the risks as they relate to the various assets and services that underlie the socio-economic conditions of a community (e.g., transportation, or health care delivery, or education, etc.). Risk in itself is a convolution of the hazards that could affect a particular community, the vulnerability (or fragility) of the exposed assets (including human, material and institutional) to these hazards, and the capacity of the community to plan, cope and recover from any unforeseen shock. Several techniques exist and are used in the identification, assessment and analysis of risk. They encompass simple empirical techniques to very complex analytical scientific and engineering approaches.

2. The existence and effectiveness of the policies, strategies and planning processes for the management of the risks and the inter-coordination mechanisms for the implementation of these policies and their resulting programs.

3. The communication and understanding of risk and risk management practices to the public and to various institutions that serve the public.

This is represented schematically in Figure 1. Understanding of risk constitutes the first step of and builds the foundation for risk management. The risk analysis step consists of translating risk assessment parameters into an understanding of the impacts on population, infrastructure, essential services, and other essential functions and operations that enable urban life to function. It also includes the assessment of the capacities of communities and institutions to cope, respond and recover, and the resulting gaps and needs. It further deals with the development of indicators and other disaster management tools.

Fig. 2 Schematic Diagram showing sequencing and overlap of elements resulting in risk reduction
The risk management function consists of the planning actions and policies necessary to manage risk while the risk communication function encompasses education, awareness, advocacy and empowerment of stakeholders necessary in developing the social capital of the community.

DRR is a dynamic process, not a product that takes time and experience to implement. It likewise depends on the specific conditions present at a particular time. As any process, it must be evaluated and adjusted accordingly. Undertaking one single element alone does not necessarily result in disaster risk reduction. It is the overlap of the undertaking of all three that results in mainstreaming DRM practices and in achieving the goal of reducing disaster risk. The notion of "integrated" disaster risk management can be seen through this schematic description, the outcome of which is embodied in mainstreaming.

3.0 URBAN GOVERNANCE STRUCTURES

An urban setting is often recognized through the administrative unit of a “city”, which is managed by a City Council under the leadership of a Mayor. The City Council approves the budget and policies of the City on behalf of its population and provides oversight over the executive branch. The Executive governs through a series of laws, ordinances, decrees, and executive orders that have been adopted by the City Council and which are in conformity with the laws and regulation of the Country.

A city has several administrative departments that render services to the population such as Public Works, Urban Development, Sanitation and Waste Management, Social Services, etc. Depending on the type of governance, a City may have jurisdiction over land use, health care, and education. The City itself can be subdivided into smaller geo-political areas (districts, wards, burroughs), which can have their own administrative/political authority. Urban sprawl and unplanned urbanization have also resulted in areas of less formal boundaries and or transient population (e.g., migrant workers) that may move in and out of a city seeking work opportunities. These communities are often at high risk, but at
the same pose specific challenges in DRM planning as they tend to fall outside the formal processes of urban governance.

As the size of its population increases, a City typically become an agglomerate of several adjoining cities, which brings the need for a metropolitan authority to manage shared services such as transportation, land use, public works, utilities, and to act as a coordinator and power broker. Thus, in a metropolitan environment there could be as much as three levels of local government structures (i.e., district, city and municipality), notwithstanding the Provincial government, which is typically another executive branch that represent the “State” executive authority in a geographical region composed of several cities.

Thus, the urban administrative structure could be quite complex in the way mandates, responsibility, authority, policy and decision-making take place. This is especially true for megacities and other large urban conglomerations. When one looks at the analysis of DRM practice, it is critical to recognize and understand this context. It is particularly important to understand how the governance structure of the country assigns responsibility over development planning, resource management planning, land-use planning, emergency management, public works and the delivery of services and utilities. In general, a decentralized governance structure that locates planning and decision-making at the local level is much more amenable to mainstreaming DRM than a centralized governance structure because mainstreaming relies on integration, collaborative decision-making, and inter-sectoral coordination—practices which decentralization fosters in local governments.

**Threat to development and social progress**

Large cities and megacities are often the centers of political and economic development, wielding tremendous regional influence. Urban risk, especially risk to large metropolises, threatens the entire economic, political and social life of countries, thus placing the well-being of a region and the country at stake. Disasters disrupt business and commerce, waste resources of all kinds, set back development, and sabotage efforts to alleviate poverty, generate wealth, and improve the living standards of a community.

**Compounding effect on the poor and the more vulnerable**

The ‘every-day risk’ of the urban poor from malnutrition, inadequate health care, substandard housing, unemployment, and illiteracy is compounded by disaster risk which makes them highly vulnerable to disasters. In the process of rampant urbanization, the world has seen a runaway growth of marginal settlements or slums, characterized by overcrowding, poor or informal housing, inadequate access to safe water and sanitation, and insecurity of land and property tenure. UN researchers estimate that there were at least 921 million slum dwellers in 2001 and more than 1 billion in 2005, with slum populations growing by a staggering 25 million per year. Slums are magnets for migrants who come to cities aspiring for a better future and are often located in hazardous areas.

**4.0 VULNERABILITY OF THE URBAN ENVIRONMENT**
Several elements contribute to urban vulnerability. It is their compounding and correlated effects that make urban disaster risk reduction a challenge. These elements can be grouped into the following vulnerability attributes:

**Unplanned urbanization is having increasingly devastating effects**

Rapidly exploding growth of cities is overwhelming government institutions with the pressures of urbanization. Much of the growth is haphazard, far exceeding the cities’ capacity to adequately plan and control development. As a result, uncontrolled urbanization often feeds the growth of slums, reinforces poverty, and diminishes cities’ ability to deal with disasters.

Faced with these challenges, cities developed housing infrastructures and offered basic social services haphazardly and often without any formal land use and urban planning process. When these elements exist, they are typically oriented towards optimization of land, and seldom incorporate any disaster risk management parameters. Migration aggravates the problem by creating large scale informal construction. Migrants also face significant challenges in adapting their past experience and coping strategies to the new risk environment in cities.

**Continuing social and physical degradation**

New migrants and the underprivileged move into inner city neighborhoods where buildings are old and in poor maintenance conditions; access roads are narrow and service delivery is difficult. These old buildings and the aging infrastructures pose a constant threat to their occupants from hazards such as fires, floods and earthquakes. A significant proportion of urban dwellers resides and/or works in these highly vulnerable buildings where they are at high risk from multiple hazards and where access for emergency vehicles is often difficult and can be completely obstructed by building debris, in case of a hazard event. Solutions to reduce social and physical vulnerabilities are socially, politically and financially difficult to devise and implement. Reducing the social and physical vulnerability of these neighborhoods remains a formidable challenge to the authorities.

**Urban risk has been neglected**

To a large extent, local authorities have been ignoring urban risk from extreme hazards. And worse, national governments and international organizations have been neglecting cities in setting DRR priorities and providing funding support, respectively. The premise has been that cities, especially megacities, have the capacity to address risk on their own; however, it is now clear that most cities, particularly in the developing world, are not effectively managing their risk. The validity of such a premise needs to be revisited as it is challenged by the ever increasing evidence of social and physical urban vulnerabilities. Schools, hospitals, essential facilities, housing, commercial and institutional property are poorly constructed and designed without satisfying minimum safety standards. Structural vulnerability studies undertaken in large cities around the world indicate a high vulnerability of existing built environment to natural hazards. Urban disasters, particularly earthquakes, have over and over
demonstrated the precarious conditions of the built environment in cities. Hence, physical vulnerability of existing environment constitutes one of the biggest threats to urban dwellers.

**Damages from climate change will accelerate, as the world gets warmer**

The consequences of climate change will become disproportionately more damaging with increased warming. Higher temperatures will increase the chance of triggering abrupt and large-scale changes that lead to regional disruption, migration and conflict. Warming may induce sudden shifts in regional weather patterns such as the monsoon rains in South Asia or the El Niño phenomenon. Climate change is aggravating the impact of climate-related hazards particularly those related to temperature and precipitation changes, which, in turn, bring forth environmental health risks.

The impacts of climate change are particularly worrying for urban regions and are likely to compound their existing vulnerabilities. 1.2 billion people are living along low lying coastal areas, many of which can be found in the world’s booming megacities. Climate change presents very serious global risks with profound long-term implications as sea level rises to at least 50 centimeters increase by 2050 which could well bring with it increased storm and flood damage, increased coastal erosion, and salination of surface and ground waters. The impacts are felt as a number of cities face serious water shortage while others are being flooded to an unprecedented rate.

**Fig. 2. (left) Projected Climate Change (from 4th Assessment Report of Intergovernmental Panel on Climate Change) and (right) its impacts (from Stern Review on the economics of climate change)**
Weak institutional arrangements

In most developing countries, legislative and institutional arrangements inhibit rather than enable local action. While it is recognized that disasters are initially local events, accountability, authority and resources are not sufficiently decentralized to enable local governments to assume ownership and take actions to manage disaster risk effectively.

Lack of political feasibility

Politicians, administrators, and community leaders all face conflicting priorities, and DRR almost invariably takes the back seat to other needs which may be considered more pressing or easier to solve. Risk is not managed preemptively, but thought of in terms of something to be dealt with when disaster strikes through emergency response and humanitarian assistance. Further, the inadequate of experience, methodology and standards for benchmarking make DRR an unattractive proposition for local officials.

Insufficient knowledge, experience and capacity

Disaster risk reduction is complex, and few administrators have experienced implementing DRR initiatives. It takes time, effort, tools, and training to assimilate disaster risk reduction in city functions and ongoing operations. Significant deficiencies remain throughout cities and megacities in terms of inter-institutional coordination, warning systems, incident command and control, resources for response, relief, recovery, and rehabilitation practice.

An additional weakness relates to the project planning processes of government. While concepts are often understood and policies are in place, carrying these policies and concepts to practice is a major hurdle for government at all level. Even among cities which have shown competency in establishing planning processes to control their physical development, carrying these planning processes into project planning and execution remains a challenging step.

Lack of Acceptable Standards of Practice

DRM is a professional practice that still lacks its own set of acceptable standards of practice. This results in a dispersion of effort and an ineffective use of resources. It also erodes the political support for local level action on DRR. Providing tools to enable translating national policies into mainstreaming planning processes at the local level would help cities in understanding the options that are available to them for managing risks and for planning and implementing urban DRM.
5.0 TRENDS IN LOCAL-LEVEL DRM PRACTICE

The list of initiatives and projects aimed at urban disaster risk reduction is too long to be reproduced here; the author cannot possibly be aware of or knowledgeable about all the on-going efforts. Nonetheless, projects and initiatives are taking place at many levels.

At the international level, U.N. organizations have launched several urban disaster risk reduction programs. Some of these programs have a global reach, such as the Global Risk Identification Program (GRIP). While GRIP does not singularly target urban DRR, it seeks to improve information on risks and disaster losses.

Similarly, the Global Facility for Disaster Risk Reduction (GFDRR) has funded several projects globally aimed at urban DRR (e.g., Metro Manila, and Quito). Some of this funding are channeled through the World Bank country offices or through implementing partners. Similarly, with the support of its Bureau for Crisis Prevention and Recovery (BCPR), UNDP has developed many projects aimed at urban DRR (e.g., Kathmandu, Metro Manila, Amman, Quito, Aqaba, Kerman and others). It has also supported programs on community-based disaster preparedness and risk reduction through participation of communities and local governments (India), as well as several urban agglomerations at the regional level such as the Regional Strengthening and Disaster Risk Reduction in Major Cities in the Andean Communities. This initiative focuses on risk reduction efforts for the capital cities of five Andean countries (Bolivia, Ecuador, Venezuela, Peru and Colombia). Most notably, the Secretariat of the UN-ISDR has established two regional task forces for Urban Risk Reduction (one in Latin American and the Caribbean and the other one in Asia-Pacific). The Task Forces are already playing an important role in terms of coordinating urban DRR efforts and providing guidance and structure to the multitude of regional initiatives.

Many governments have recognized disaster risks in their cities and initiated risk assessment, preparedness and in some cases, mitigation programs. In particular, countries such as Turkey, Jordan, Indonesia, Philippines, India, Uzbekistan, Ecuador and Colombia can be credited for having active national urban DRR programs.

Local governments are increasingly more aware of the consequences of risks from natural and man-made hazards on their cities and localities and are actively improving their capacity to deal with such risks. Many cities have developed a comprehensive understanding of their exposure to hazards and have taken steps to improve their capabilities to respond and reduce disaster risks. Among the most dedicated cities are Istanbul, Bogota, Tehran, Quito, Metro Manila, La Paz, Kathmandu, Mumbai and several others.

Local government organizations are also taking a more active role in promoting urban DRR as part of sound governance practices among their members and associates. The Global Forum for Urban Disaster Reduction, which was launched at the First Global Platform (June 2007) as a broad forum of UN-
Organizations, ISDR Secretariat, Local Government Organizations, Cities, ProVention Consortium and several other agencies and organizations is moving forward with awareness, capacity building and political actions from mayors and local authorities to indicate a commitment to urban DRR and to mobilize the engagement of local officials and professionals in DRR activities.

To energize the Global Forum through specific advocacy, coordination and capacity building activities, UCLG (United Cities and Local Governments), METROPOLIS, CITYNET, ICLEI Local Governments for Sustainability, ProVention Consortium and Earthquakes and Megacities Initiative (EMI) recently formed the Partnership for Urban Risk Reduction (or PURR). The ISDR Secretariat has spearheaded a similar initiative under the Alliance for Local Government.

This flurry of activities is certainly raising the attention on urban DRR. It is however too early to state what has been their global impact and efficiency. The lack of a systematic compilation and evaluation of these activities coupled with inefficiency in the mechanisms for sharing and coordinating impair an objective and comprehensive evaluation of DRR projects/initiatives.

While progress has been accomplished and many cities are taking steps in terms of reducing their risks, the overwhelming majority of cities have not even reached the initial stage of recognizing their risk. Hence, most of the initiatives have been focused in improving emergency response capabilities.

6.0 LIMITATIONS, ISSUES, AND IMPEDIMENTD OF URBAN DRM PRACTICE

The Hyogo Framework for Action (HFA) and its related implementation guide “Putting Words into Action” offer a set of principles and suggested actions for countries to undertake in order to implement sound DRM practices and progressively achieve DRR. The HFA is presented as de-facto standards for government, as its credibility is established by 168 countries that have adopted and ratified it. However, the HFA is directed towards central governments. Thus, crafting and implementing DRR initiatives in the field has been a challenge for local governments. At this time, there are no substitutes for HFA that are designed specifically for local level implementation.

There is no lack of tools, approaches, methodologies in DRR. However, none of these can be considered to be a “standard” of practice. The lack of a credible and accepted set of standards makes it difficult to have an objective identification and assessment of various initiatives taking place in urban DRR. At the same time, there is a lack of coherency and complementarities of the on-going urban DRM initiatives. Further, there are no adequate means to measure their effectiveness in terms of development outcomes and impacts. Undoubtedly, taken together, these initiatives are advancing the cause of urban DRR, but to which level each one of them is mainstreaming DRR remains difficult to establish. To illustrate this point, two widely used DRR practices are discussed:
Hazard, vulnerability and risk identification

There are several initiatives aimed at identifying and mapping hazard, vulnerability and risk. However, risk information oftentimes are not integrated into a formal land use planning process, construction code, or actual physical strengthening of infrastructure or services. For example, a number of agencies and academic institutions generate significant amount of knowledge on risk. Local and central governments also commission hazard, vulnerability and risk studies. It becomes a problem when this body of knowledge remains in the hands of a few experts and does not find its way into urban development planning and land use planning, for example. Similarly, national societies of the Red Cross/Red Crescent Movement are promoting Vulnerability and Capacity Analysis (VCA).

At the same time, communities are encouraged to establish alert systems to watch river flood levels and protect themselves against potential floods. Clearly, hazard and risk studies, VCA and community-level emergency and warning systems (EWs) are all aimed at vulnerability reduction. However, it is difficult to measure the effectiveness of these investments. The mechanisms to integrate risk information into development planning processes are limited by poor of coordination and lack of opportunities to share knowledge.

School awareness programs

School awareness programs have been undertaken for more than two decades and have now been put in place in many countries. Teaching children about disasters and training them in terms of what to do before, during and after an earthquake is an essential awareness raising and preparedness activity for a community and the country, as a whole. But evidence shows that in most cases, these awareness programs do not include efforts to identify the physical risks to the school facilities and to develop programs for structural reduction of risks when present. Recent disaster experiences show that in many countries, the earthquake vulnerability of schools is alarming. The same question arises: would school awareness programs be considered to be a DRR activity if they are not linked to a physical safety plan?

The lack of standards coupled with the lack of a universally accepted definition of DRR result in an inefficient use of resources, inadequate strategies and poor coordination. A set of DRM standard can provide a more efficient approach to guide governments, public, private and community-based organizations in framing their hazard, vulnerability and risk assessment actions within the context of development.

Conceptual limitations

Sound practice in DRM is recognized as an integrated inter-sectoral and inter-institutional activity. It is widely accepted that one of the principal impediments in implementing DRR resides in the difficulty for bureaucracies to negotiate, devise and incorporate inter-sectoral arrangements and their related inter-institutional communication protocols. Government agencies typically struggle putting in place mechanisms for integrating DRR in development processes. This is mainly because development activities are structured to take place at various levels of government and are strongly influenced by private sector intervention and individual and household consumerism behavior.
The principle for inter-sectoral integration is well accepted. However, in practice, DRM approaches are often broken down into sectoral activities with little thought in terms of how these components should be integrated.

As an example, DRM is often described in the context of the so-called “Disaster Cycle.” This approach stresses a “sequential” concept from pre-disaster to post-disaster measures and not an integrated concept for DRR. The disaster cycle assumes that the integration takes place “naturally.” This assumption is flawed as demonstrated in practice. Mainstreaming requires a strategy that moves from an event-focused approach to process-oriented and decision-making thinking.

The same limitation is found in HFA which again segregates DRM practice into five separate planning actions: a) Legal and Institutional; b) Risk Knowledge; c) Education and Awareness; d) Risk Reduction, and e) Response Planning. While HFA does emphasize that these five items should be considered in an overall integrated national strategy, the actual practice shows that such integration is difficult to accomplish under such un-integrated concepts.

These conceptual contradictions need to be recognized in order to devise a conceptual approach that inherently leads to mainstreaming. This can be done by developing an integrated model right at the conceptual level.

7.0 FRAMEWORK FOR SOUND DRM PRACTICE

The challenge facing the implementation of DRR is that it is an emerging practice that is not understood by governments and is often trivialized in terms of putting it in practice. As discussed above, urban vulnerabilities stem from many causes and the impediments to implementing DRR are often daunting. One must thus undertake the process of developing a DRM practice as a long term and well-planned endeavor. In the following section, a mainstreaming framework is proposed as a means to mainstream DRM practice in cities. It is hinged on three elements: Local Implementation plus Central Coordination plus Participation. It recognizes the role of communities, and their governing institutions and calls for a participatory process in order to build knowledge, ownership and sustainability.

Mainstreaming framework

Recognizing that DRM implementation is essentially a local function can serve as a start for developing an integrated model for mainstreaming DRM. Local government typically has authority over a number of key services and functions that need to be made resilient to disturbing external hazard events in order to reduce urban vulnerability. These services include transportation, water and sanitation, engineering and public works, housing and building construction, land use and urban development, and social services. These are the base functions where mainstreaming needs to take place locally. However, local implementation cannot be done in isolation from the central agencies of the government, which have legal and institutional mandates and are in charge of oversight and resources.
The role of the national government to provide the legal and institutional basis for DRM as well as to provide the resources and to ensure compliance is fundamental. However, it must recognize the importance of local implementation and should be supportive of the concept of decentralized action.

The dual effect of local implementation and central coordination is not sufficient by itself to achieve mainstreaming. These institutions must mobilize the social human and institutional resources of the communities though the participation of various stakeholders. These include the academia, private sector, trade and workers unions, professional organizations, media, community leaders and representatives, volunteers, networks and alliances, and other representatives of civil society. Community-based approaches are effective in developing ownership, raising awareness, and creating an informed citizenry that works coherently with its leadership. All these efforts contribute to the socio-cultural and institutional transformations necessary for mainstreaming DRM. It links the top-down approach with the bottom up approach.

This model shown graphically by the three boxes of Figure 3 was devised by the author and has been used by EMI (Earthquakes and Megacities Initiative) in guiding its DRM work with its city partners. The model however is not unique, and others can be devised. It merits discussion. It is however different in its concept from the sectoral approach of HFA or the cyclical approach behind the so-called “Disaster Cycle” model.

![Fig. 3 – An Example of Mainstreaming Model for Local-Level DRM (Local Implementation – Central Coordination – Participation)](source: Earthquakes and Megacities Initiative  EMI (www.emi-megacities.org))

### Need for a participatory process

The participatory approach is at the core of mainstreaming DRM practice. By nature, it facilitates the communication of risk, the development of ownership, and the inter-sectoral coordination among stakeholders. It also enables consensus building and social mobilization when conflicts and disagreements need to be resolved. It must be emphasized though that mainstreaming will not create new governmental structures. It will rather enable existing institutions in understanding and integrating DRR within their operations and functions. Thus, these institutions must be part of the discussions, strategic planning, and action planning processes. School safety programs will not be successful without
the active and meaningful participation of students, teachers, educators, parents, physical planners, social workers and community leaders. Difficult issues such as informal housing cannot be effectively resolved without the participation of the affected populations, the local policy makers, city planners, and community advocates. Adopting a structured participatory process is essential in mainstreaming DRM at various levels.

Need for acceptable standards of practice

As stated earlier in this paper, the lack of international standards of practice for urban DRM is a significant impediment in mainstreaming DRM. It negatively affects many aspects of policy, planning and implementation of DRR. The development of a globally accepted and credible set of standards would make urban DRM a much more acceptable proposition for policy makers, since their policies would be measured with respect to these standards. The standards will also provide institutions with a set of risk-sensitive planning concepts and procedures aligned with formal and established institutional planning processes. They would also help in mobilizing resources and provide guidance on capacity and competency development. Further, standards of practice would provide a framework for discussion and debate that would be much more efficient, systematic, and constructive than the current environment.

Indicators for mainstreaming

A set of benchmark indicators should measure progress on the implementation of the standards of practice. Indicators have an important role in facilitating risk communication, enabling decision-making and allocating resources. There are several efforts related to developing DRM indicators. Figure 4 provides a partial set of mainstreaming indicators that could be attached to local level implementation of DRM. They are based on the concept of mainstreaming explained above. This set of indicators is not unique nor comprehensive or ideal. However, it is consistent with the concept of mainstreaming DRM at the local level.

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consultation and recognition with central and national strategies for DRR.

Source: Earthquakes and Megacities Initiative (EMI) (www.emi-megacities.org)

8.0 Turning challenges into opportunities

Here are some alternatives on how to turn the challenges into opportunities for effective mainstreaming of DRM. They can be segregated into short and long term strategies.

Attaining more favorable legal and institutional arrangements

Decentralization can build more capable cities and local institutions. Many local governments have not had the necessary legal mandate and authority to play a major part in implementing policies and practices in meeting their cities’ immediate and long-term disaster risk reduction goals. Success requires balance, so that cities acquire not only responsibility and accountability for disaster risk reduction but also the authority and resources to effectively carry it out. Reversing the “pyramid” of resources is the key to improved local governance and mainstreaming DRR policies and practices in government activities.

Integrating DRR in land use planning and urban development

The difficulties of implementing urban disaster risk reduction will become less challenging if its elements are directly integrated in the development planning process of cities. Cities typically have established formal processes for land use planning, physical planning and urban development. Integrating DRM into these processes provide some of the most efficient mainstreaming strategies, and deserves more attention and investments. Providing skills and competency to urban planners in risk-sensitive land-use planning and incorporating these tools into zoning and other land-use regulation is an achievable short term strategy.

Improving the project planning and project execution capabilities of local government

Crossing the step from planning to project execution and review is a major hurdle for city governments. Investing in supporting local authorities in carrying their plans into project planning, execution and management would help reach positive accomplishments in DRR. Weak project planning, execution and management is typically a systemic issue in local governance especially in developing countries. For newly introduced activities such as DRM this process is even harder. Project execution and review is often underestimated and requires multi-disciplinary skills and long term assistance in terms of technical and financial resources. The standard for performance should not be in terms of how much plans have been developed but how many activities of these plans have actually been successfully implemented.
Promoting urban redevelopment as a powerful tool to reduce urban risk

Reducing the vulnerability of existing building stock is considered one of the most complex urban risk reduction issues. Urban renovation and urban rejuvenation can increase the economic and social potential of older neighborhoods while reducing their risk. This is done by introducing both structural and non-structural mitigation measures. Risk-sensitive urban planning and development tools can provide more viable options to the political leaders, the residents and the business community to make informed decisions. The legal, social, political and economic factors associated with urban renovation can be quite challenging and will require compromises and good leadership to resolve. Pilot studies can build experience and a competent community of practice in undertaking such projects.

Example of an urban renovation project

Marikina City, Philippines. The city’s flood mitigation program has dramatically decreased the exposure of residences, businesses, and essential facilities to flood. Continuously funded by local government, the project began in 1992 and has reduced the actual flooded area from 27.52% in 1992 to 19.04% in 2004 with 30% savings on the projected budget. In addition, to ensuring safer living conditions, the project provides for more open space and a cleaner environment as well as greater benefit to the business community. Source: Mega-Know www.emi-megacities.org/megaknow.

Enforcing life-safety construction standards for every new building

The knowledge for building earthquake-resistant structures exists for more than 40 years. Yet, we continue to build thousands and thousands of buildings each year that constitute a life safety threat to their otherwise unaware occupants. Studies show that the cost of making buildings safe from earthquakes is no more than 5-10% of the construction cost. For instance, all new construction in Mumbai can be made earthquake resistant with a recurring additional investment of under US$10 million per year, representing no more than 5% of a buildings construction cost. Competent building codes and more importantly enforceable implementation processes have proven to be challenges to having disaster-resistant construction. However, many cities and countries are tackling this problem with success, and the issue is increasingly better understood by policy makers. Reducing human losses in the most exposed cities from preventable building collapses is a long term strategy that requires training, education and practice-proven legislative processes.

Keeping schools safe from earthquakes

The enormous loss of life in collapsed schools around China’s quake-stricken Sichuan Province in May 2008 could have been significantly reduced using known methods for designing or retrofitting structures in earthquake zones. In recent years, there have been deadly school collapses after earthquakes in Italy, Algeria, Morocco and Turkey. Most notably, in Pakistan on Oct. 8, 2005, at least 17,000 children died as more than 7,000 schools collapsed. A 2004 OECD study estimated for 10 risk-prone countries that 180 million people, including 40 million school-age children, face an earthquake risk equal to that of northern Pakistan.
Raising the standard of care and work ethics

Local institutions can be strengthened by training and improving the skills of city practitioners and elevating their value in society. Professional and trade organizations can play an important role in improving the standards of practice by putting in place, say for example, professional certification mechanisms. This short term strategy would build local ownership and can take place through better trained professionals and managers.

Developing a culture of prevention

The community’s well-being and self-reliance can be strengthened through education and preparedness. A balanced program of community and institutional education and preparedness enhances welfare, safety, preparedness, stability, robustness, and self-reliance. Disaster preparedness should be fostered as an integral part of mobilizing social participation for the planning and implementation of development programs and poverty reduction initiatives. Vulnerable communities are often those that are the most disenfranchised from local governance processes. Linking community-based DRM initiatives to local developmental processes will empower communities in terms of participating in and influencing the development process and will improve governance by improving accountability and transparency and reducing opportunism and corruption. As argued previously, these linkages must be explicit and part of an overall mainstreaming strategy.

Improving international and regional cooperation

An effective strategy to DRR will require a more intensive and extensive international cooperation and multi-stakeholder orientation. The private sector should be engaged and challenged by governments and civil society to contribute to DRR through public policy debate and public-private partnerships. It also requires partnership between cities, through international frameworks that support action for the achievement of shared goals.

Generating resources and incentives

Inadequate resources and incentives compromise disaster risk reduction action. Disaster risk reduction is a long-term, low-visibility process, with little guarantee of tangible rewards in the short term, either for politicians in affected cities or for donors. However, inaction brings further complication of the problem and further accumulation of risk, creating the need for future investments that are significantly costlier than those needed now. Development projects should have budgetary allocations for hazard and vulnerability studies that are geared towards long term sustainability. Sound practices should be compiled and studies undertaken to demonstrate that the benefits of strong, early action outweigh the costs. Sound DRM applications that have improved the economic and social capital of communities should be well documented and used as examples of strong evidences of change for other cities and communities. It is likewise recommended that donors and funding agencies adopt a policy of allocating a portion of the emergency relief and reconstruction budget to long-term risk reduction investments.
The need to establish an urban DRR practice goes beyond the noble humanitarian goal of saving lives. It defines the future of our cities in terms of the protection of their assets and the efficiency and capabilities of their services and governing structures. The most tangible incentives reside in mobilizing the human resources of communities and institutions. We must invest in developing the human potential for DRR through training of practitioners, competency buildings of professionals and decision makers, peer-to-peer sharing, and knowledge accessibility and valorisation of the human potential through recognition and dissemination of sound practices. Developing the human potential will enable communities and institutions to push the DRM practice forward. It would turn liability into assets and challenge into opportunity.

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