

DEVELOPING A FRAMEWORK FOR IDENTIFYING DISASTER RISK MANAGEMENT SOUND PRACTICES IN MEGACITIES

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SUMMARY

The practice of applying the term ‘megacity’ to any large (over 8 million inhabitants) population centre¹ does not adequately capture characteristics that are important for developing sound disaster risk management (DRM) practices. In our attempt to identify effective and replicable systems or routines we are coming to the view that there are areas specific to megacities which have not been taken into consideration when actors instigate vulnerability reduction measures they believe to be sound practices. Moreover, what works for megacities may be different from other urban areas, although there is little research to substantiate this speculation. This has prompted us to reflect on the need to develop a hierarchy of sound practice attributes that start with some basic needs of a megacity *qua* megacity. In attempting this, we are trying to find a way to encourage stakeholders within a megacity to see themselves and their specific jurisdictions as vital *inter-dependent components* of a *self-healing system*. Such a system will, in effect, be a *learning system* that gains insights from and builds on the experiences of all its parts, and in particular has the capability of transferring solutions from one part of its urban setting to another as part of its normal *modus operandi*.

INTRODUCTION

EdM researchers have been collaborating with colleagues in research and practice arenas on a program exploring aspects of disaster risk management in the context of megacities. An area we are focusing on is the identification of systems or routines that might be thought of as a ‘sound practice’ which, if adopted or followed in other parts of the same megacity or in another megacity would result in an overall reduction of natural hazard vulnerability. In this context, we describe *disaster risk management* as ‘a systematic process that produces a range of measures associated with hazard mitigation, emergency preparedness, impact response and disaster recovery, and which contributes to the safety and well being of communities and the environment; and at the same time parallels risk management and good management practices’. We define *sound practice* as ‘any proven idea, program, technique, mechanism, method, practice or procedure for assessing, managing and reducing risk in complex urban areas’. These may be in areas related to legislation, land use practice, education, building practices, enforcement, response management, risk reduction, hazard assessment, any combination of these or similar actions. By *vulnerability*, we mean a society’s susceptibility to experience damage and loss when exposed to a potentially damaging physical event and as a measure of the difficulties it confronts in regaining an acceptable social equilibrium. In this venture (the Cross-Cutting Capacity Development [3CD] Program²), we have directed our attention to

megacities in the developing world and, more specifically, within Asia and have been working with two case studies (Mumbai in India, and Manila in The Philippines). Our working definition of *megacity* is ‘a densely developed cluster of nested administrative units occupied by a population of several million people’³.

RATIONALE FOR A SOUND PRACTICE HIERARCHY

This working definition highlights some special features of a megacity that, for disaster management purposes in particular, are of crucial importance. Probably the most significant characteristic of the megacity is that it is typically comprised of contiguous politically discrete entities – literally cities within cities –characterized by isolation between sectors and fragmented program initiatives. The capital of the Philippines, Metropolitan Manila (also called the National Capital Region), is a case in point: this area comprises 17 politically autonomous cities and municipalities within which live, officially at least, 10 million people, and comprises 12% of the nation’s total. Local government units are strong in the Philippines and a considerable share of public national resources, amounting to 40% of internal revenue collections is allocated to local government to fund devolved functions. To offset the effects of autonomous governance and to assist the smooth operation of essential services a metropolitan development authority was created in 1994 as a special development and administrative region responsible for planning, supervising and coordinating certain basic services including disaster management. However, the Metropolitan Manila Development Authority can only pursue tasks ‘without prejudice to the autonomy of the affected local government units’.

Another characteristic of modern urban life in general and megacities in particular is that at the individual level city-dwellers tend to behave and operate from a sense of localness and boundedness. By this we mean that megacity inhabitants tend to define and identify themselves in terms of their immediate locality – they perceive the local area where they live as an enclave and psychologically separate this physical space from the much wider urban complex. An enclave is territory surrounded by foreign territory, and this captures the idea nicely. Such an enclave in the sense proposed here has sometimes been described as a ‘community’⁴. It might also be portrayed as an ‘urban village’. Both terms offer a sense of self-containment.

The concept of enclave highlights another characteristic that is less harmonious in many of the world’s largest cities: large cities are often differentiated ethnically, linguistically, religiously, politically, social organizationally and economically. These characteristics are often exploited by dominant social groups so that undesirable hazardous activities tend to be concentrated in some locations. This might also mean that disaster risk management efforts developed within a distinct social/cultural enclave may not be readily transferable⁵.

These characteristics highlight a major disaster risk management challenge for a megacity: how does one coordinate the discrete parts without losing the identification that is so essential for cooperation? Coordination and cooperation are important aspects of

effective disaster management, irrespective of the size of a city. This is particularly important for megacities because of the fracturing of the administrative system that seems to be an intrinsic characteristic. At the same time, natural or technological disaster impacts are unlikely to have equal effect over an entire megacity: depending on the hazard agent it is more realistic to assume that heavily impacted areas will be limited and other parts of a megacity will become filter or fringe areas⁶ that channel needed resources. Under these conditions, effective response implementation depends in large part on how well the various discrete parts can come together: inter-city and inter-agency memoranda of understanding, mutual aid agreements and similar cooperative mechanisms play an important part in this. This is equally important in hazard mitigation and other risk reduction measures, where merging programs and developing cross-boundary projects can enhance efficiency and overall effectiveness. These arrangements uphold the first component (the need for coordination) while maintaining the second condition (the need for cooperation).

From a disaster risk management perspective coordination and cooperation relate to various system levels. At one level, they relate to decision-making between local governments so that, for instance, local regulations enacted in one jurisdiction dovetail with those in a contiguous authority. At another level they relate to coordination and cooperation between similar agencies between different local bodies so that, for example, mitigation practices conducted in one complements or even encourages similar actions in a neighbouring local body agency. Coordination and cooperation also relate to the interdependency of utility lifelines, the links between them, and the critical nature they perform in distributing essential functions and resources. It is not unusual in the Asian city context for many lifelines to be publicly owned and operated. Moreover, many pass through more than one local jurisdiction. Coordinated management programs are therefore essential, and while this is often the reason for creating an umbrella authority to serve this function (such as the Metropolitan Manila Development Authority mentioned earlier), coordination and cooperation amongst all participating bodies are nevertheless essential.

Another level requiring coordination and cooperation is local enclave (or community/village) initiatives. These citizen-oriented activities direct attention to what residents can do by themselves for themselves as local self-help actions. They are often triggered by a particular local event or local inhabitants reacting to an issue that higher-level authorities (especially local government) have failed to deal with in a satisfactory manner. An external initiator seeking to find a local setting in which to pursue a specific set of outputs may also generate similar actions. However, within a megacity context, there is a tendency for activities like these to remain local; they tend not to be seen as a prototype to be picked up and emulated throughout the entire megacity. We speculate here that one of the reasons why this does not occur is in part because of localness and boundedness – basically locals are looking after themselves, not others in the megacity. We speculate further that this is compounded by a lack of integration between local authorities brought about by a weak overarching governance system.

These issues make us believe that there are areas that might be specific to the megacity and which have not been taken into consideration when actors instigate vulnerability reduction measures they believe to be sound practice. Our point is that what might be a sound practice for a city of 300,000 people with a single administrative system, for example, may not be sufficient for a megacity. This has prompted us to reflect on the need to develop a hierarchy of sound practice attributes that start with some basic needs of a megacity *qua* megacity before leading to specific practices, techniques and/or outcomes. In thinking about this approach, we are trying to find a way to encourage stakeholders within a megacity to see themselves and their specific jurisdictions as vital *inter-dependent components* of a *self-healing system*. Such a system will, in effect, be a *learning system* that gains insights from and builds on the experiences of all its parts, and in particular has the capability of transferring solutions from one part of its urban setting to another as part of its normal *modus operandi*. Our assertion is that without this type of sound practice, it is unlikely a megacity will be able to successfully integrate all the highly appropriate individual actions that are taking place within its constituent parts. If it fails to achieve this integration, a megacity will not be any better off and will continue to be one of the world's most hazardous and dangerous places to live. The remainder of this paper will explore our thinking to date on what the components and linkages of a sound practice hierarchy for megacities might be.

COMPONENTS OF A MEGACITY SOUND PRACTICE HIERARCHY

Figure 1 outlines a four-layer hierarchy we propose working through for sound practice issues in megacities. The first layer is a set of *principles* specific to the megacity and comprises six values that are discussed in detail in Table 1. We believe these are important starting points because they need to be taken into account when the significance of any particular practice or technique is being considered. Failure to do so might result in a specific practice or technique developed or adopted in a particular enclave not being transferable to a significant proportion of enclaves throughout the megacity – something that would not reduce the overall level of vulnerability of the megacity as a whole.

Figure 1: A Hierarchy of Sound Practice Components for Megacities

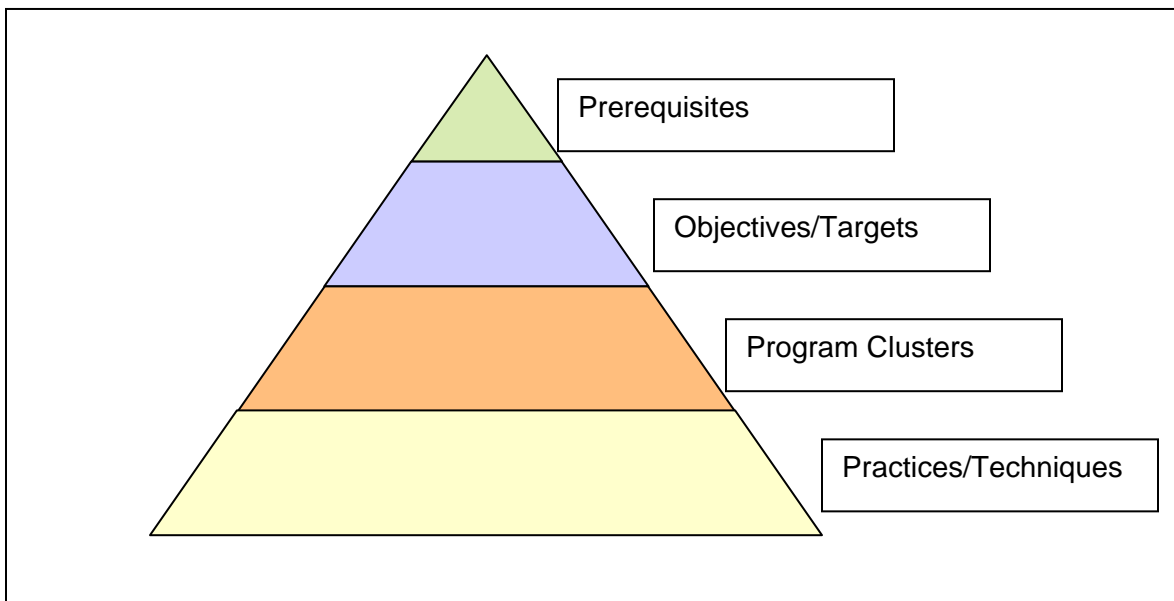


Table 1: Prerequisites for Sound Practices (SP) in a Megacity Context

Criteria	Key Issue	Comment
1. Universality / Transferability	<i>Can the SP developed in one megacity be applied in other megacities?</i>	Is the SP hampered from becoming a universal tool because it is locality-bound (including area and cultural specificity), or heavily resource-dependent? If the SP is locality-bound, what specific component/s hinders its universal application, and can it/they be substituted? If it is resource-dependent, what are the specific restrictions and how/when might they be overcome?
2. Applicability	<i>Is the application appropriate for the relevant parts of a megacity's multiple-city governance structure?</i>	Many megacities comprise contiguous cities with their own governance systems, often overlain by an 'umbrella' coordinating structure. To benefit a megacity as a whole, SPs should have application for as many relevant components as possible in a multipart governance composition.
3. Expandability	<i>Can the small-scale activity/ies that typify SPs be expanded, or replicated, throughout the same sectors / sections of a megacity?</i>	Many SPs appear to be conducted on a small scale in a particular sector of a city, and/or with a specific section of a community). There is little current evidence that these small-scale activities are exported elsewhere in a megacity. What is inhibiting this from happening?
4. Orientation / Focus	<i>Is the SPs focused toward reducing the overall level of risk within a megacity.</i>	The notion of DRM is to help megacity officials build on their existing, predominantly response-focused, activities by broadening the efforts into a more holistic risk reduction program that integrates hazard mitigation practices.
5. Assimilation / Integratability	<i>Is the SP able to incorporate, or to be assimilated into, other risk reduction practices?</i>	An effective SP should be instrumental in bringing components together, or in some way amalgamate discrete actions that enable and/or enhance a holistic DRM outcome.
6. Impact / Effectiveness	<i>What effect does the SP have on actually reducing megacity-level risk?</i>	Unless a practice contributes to risk reduction in a real sense, its utility for the megacity is probably questionable. One way to assess a contribution is to have performance criteria that are measurable .

The next layer, *objectives and targets*, is taken directly from the ISDR's 'Living With Risk'. The compilers suggest that 'objectives and targets for disaster risk reduction should be SMART, in order to develop and assess effective strategies'⁷. By SMART, they imply the following:

- Sustainable over time

- Measurable, with defined criteria for success and specific benchmarks
- Achievable within the timeframes that governments set.
- Relevant, to satisfy varied situations related to hazards, vulnerabilities and capacities and set within governmental structures.
- Timely, related to carefully framed tasks, with clear short and long-term goals.⁸

We believe these five attributes are important for any level, and hence they serve as useful yardsticks for vulnerability reduction activities in the megacity context.

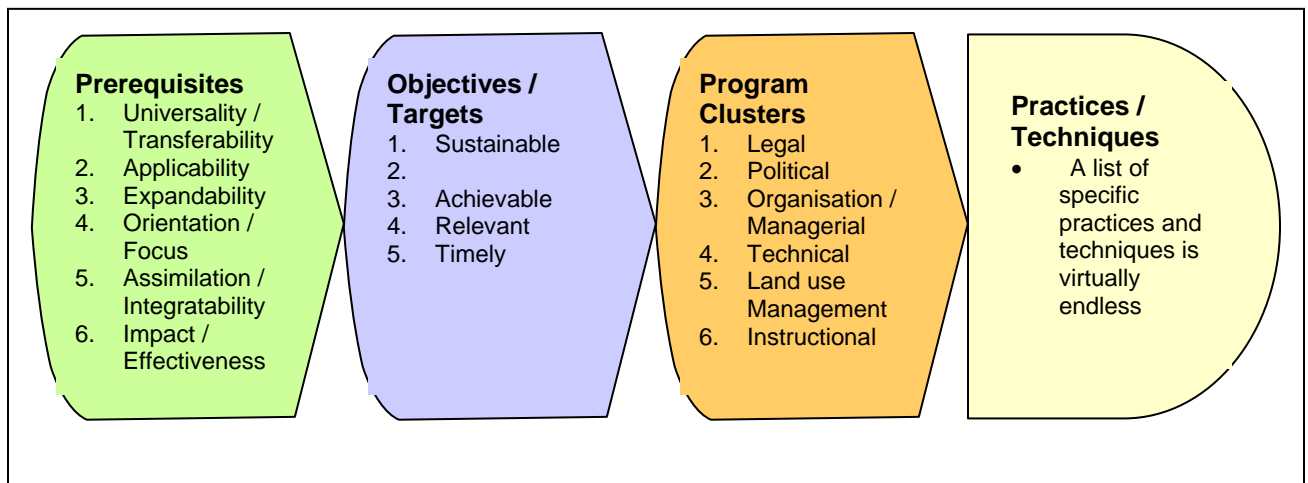
The third layer consists of *program clusters*, which refer to groups of activities that have a central theme. We have identified six clusters that seem to capture most types of activities:

- Legal (incorporating laws, regulations and other enactments)
- Political (which includes jurisdictional matters, compliance and enforcement, economic and other incentives and disincentives)
- Organizational-managerial (encompassing emergency management practices, agency procedures and processes, inter-agency coordination, etc.)
- Technical (covering structural mitigation measures, information technology, risk management tools, hazard-specific mitigation actions)
- Land-use management (bringing together planning practices, development planning, environmental management practices)
- Instructional (comprising public awareness, education programs and so on).

Ideally, we suggest a megacity should be pursuing specific *practices and techniques* (the final layer) from several, if not all the above clusters.

We suggest these four layers are linked in the following manner:

Figure 2: Megacity Sound Practice Linking Framework



We are currently testing this model against the practices submitted by Cluster City Partner participants within the Earthquake and Megacities Initiative's (EMI) Cross-Cutting Capacity Development (3CD) Project, and which EdM is a research partner. Practices that have been submitted to date include:

- Single source public emergency telephone number ('dial 108') feeding into a multi-agent alert/call-out system that electronically records event details and signals a dispatcher follow-up requirement (Mumbai).
- Program of Enhancement of Emergency Response (PEER) a standardized emergency response system linked to the Municipal Government, Fire, Police and hospital systems (Mumbai).
- Canal maintenance flood prevention scheme by city departments and local citizen groups (Manila, Mumbai)
- New building codes and enforcement mechanisms (State of Maharashtra).
- Private enterprise Mutual Aid Scheme in the hazardous materials sector (Mumbai).
- Multi-agency coordinated emergency management medical services (Manila).
- Health services network among Department of Health and local government units (Manila).
- Urban Search and Rescue Practical Exercise (USARPE) to improve response capacities in communications, logistics and institutional coordination (Bogota).
- Senior Citizen Retrofit Program, a non-structural mitigation measure to prevent damage and injuries to single family residents (Los Angeles).
- Building earthquake damage evaluation – 2058 high-risk city blocks surveyed and details recorded that within 1 hour following an earthquake can ascertain the general condition of every building located in the zone (Mexico City).
- Earthquake Master Plan – an inter-disciplinary framework incorporating technical, social, institutional, legal and financial parameters of an earthquake mitigation program that includes action plans, processes and a partial implementation strategy (Istanbul).

By using real-world megacity practices *in situ*, the utility of the sound practice framework offered here can be validated.

CONCLUSIONS

If megacities are somehow different from other urban forms in terms of 'what works' and 'what does not work', then approaches to disaster risk management may also require being different. Less speculatively, sound practices need to be adaptable and flexible if they are to be effective. In the megacity context, these attributes seem to be significant if insights and experiences are to be transferred from one location to another.

Successful adaptation to changing circumstances can be enhanced through the availability of options, and learning to live with uncertainty through managing natural hazards can be assisted by combining one's own societal practices with others. In this way the absorptive capacity of a social system can become greater.

The framework we are developing is designed to encourage megacity stakeholders, especially those tasked with developing public safety programs or those working with community groups, to be alert to the experiences of others and to learn from and adapt the options other megacities are pursuing. By exploring the relevance of the principles we have identified by working with real world examples, we hope to identify processes that can point the way by which city officials and interested researchers can identify, encourage and replicate sound disaster risk management practices that are relevant to the world's largest urban social systems.

REFERENCES AND ACKNOWLEDGEMENTS

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¹ According to Beaverstock et al., the concept of 'megacity' epitomizes a demographic tradition that is largely interested in the sizes of cities and explores the human and ecological implications of contemporary and future population concentrations.

² A companion paper by Shirley Mattingly and colleagues provides further details on the 3CD Program.

³ We are grateful to Ken Mitchell (Rutgers University) for helping us revise our original definition.

⁴ The JICA Metro Manila Earthquake Impact Reduction Study defined community as 'a certain unit in which people can share their interests and feel the sense of unity. P.8-25 Vol.3. Main Report #2. Another description is that 'community is defined as a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together – DW McMillan and DW Chavis (1986), *Sense of Community: A Definition and Theory. Journal of Community Psychology*, 14. pp6-23. Cited in UNCRD, 2003. *Sustainability in Grass-Roots Initiatives. Focus on Community Based Disaster Management*. Disaster Management Planning Office. Hyogo. Japan.

⁵ We are grateful to Tony Oliver-Smith (University of Florida) for reminding us of this fact.

⁶ Following AFC Wallace (1956), *Tornado in Worcester*. National Academy of Sciences/National Research Center. Washington DC.

⁷ ISDR, 2004. *Living With Risk: A Global Review of Disaster Reduction Initiatives*. 2004 Version. Geneva. Page 395-6.

⁸ The unit of analysis for the ISDR is the nation-state; we have removed all reference to 'national'.