



## Research article

# Institutional framework for preparedness and response of disaster management institutions from national to local level in India with focus on Delhi



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## ABSTRACT

Delhi has experienced six major floods in the past with the most recent one being in June 2013. Flood related risks are compounded by increasing vulnerability due to rapid urbanisation and growing population. This increase is an indication of the need for enhancing the preparedness and response of institutions dealing with floods. The study is based on personal interviews and discussions with officials engaged in managing disasters from national to local level. Study attempts to identify the key issues and challenges faced by institutions engaged in disaster management in Delhi in order to reduce the potential impact from future disasters. Results reflect that a number of factors such as awareness and perception, financial resources, technical resources, policy, institutional arrangements, leadership and human resources prevent effective and timely institutional preparedness and response to disasters. Wide variations exist in awareness and perception of disasters among the officials engaged in managing disasters from national to local level. Thus, local institutions and the community being at the forefront, need to develop direct linkages with institutions at different levels by following a participatory approach for preparedness.

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## 1. Introduction

Urbanisation coupled with growing population and urban concentration has contributed to an increase in the frequency, severity and magnitude of disasters. This increase has resulted in impacts all across the globe exposing the poor and marginalised people to higher risks and vulnerabilities. Asia faces the greatest exposure in terms of population and assets [18] since the underlying natural risks when combined with the region's large population, inadequate infrastructure, and socioeconomic conditions result in high vulnerability to disaster impacts. Centre for Research on the Epidemiology of Disasters (CRED) recognises China, United States, Indonesia, Philippines and India as the top five countries frequently hit by natural disasters between 2002 and 2012. Disasters will continue to occur at an unprecedented scale if steps are not taken in advance [6] with the poorest households getting the most affected by natural disasters [23].

With many developing countries within Asia-Pacific region, floods account for the largest number of people affected, as well as the largest number of people killed by disasters [32]. Urban flooding results from high density of settlements, habitation in

flood plains, impenetrable surfaces, poor drainage and waste management [13]. Latest report on Impacts, Adaptation and Vulnerability points out that Delhi is among the three of world's megacities at high risk of floods [15]. This is evident through the occurrence of early floods in June as compared to floods in the past which occurred in August. In addition, there has been an increase in the number events where water level of river Yamuna went beyond the danger level of 204.83 m. Thus, disasters will continue to occur in the near future due to people settling in hazard prone areas [14,16] resulting in damage and loss from future disasters.

### 1.1. Floods in megacities

With changing climate, rapid urbanisation, high population growth and widening territorial boundaries, most of the urban growth has concentrated in hazard prone low lying coastal areas and other hazardous topographies. For example, huge cities of Asia have been growing at over 4 percent every year including Dhaka, Delhi, Karachi, Jakarta and Bangkok (Chen and Heligman, 1994). In many of such big cities of Asia, urban population growth and spatial expansion to a large extent has been unplanned with massive changes in the city's land use. This poor and unplanned development has resulted in socio-economic and environmental consequences [12,7]. Dhaka with a population of slightly more

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than 14.5 million faces similar challenges.

In the context of disasters, coastal cities such as Lagos, Mumbai and Dhaka are at risk of flooding due to poor drainage (Awuor et al., 2008; Adelekan, 2010) and riverine and coastal storm surge respectively (Mehrotra et al., 2011a). Megacities such as Shanghai and Bangkok have been bearing the brunt of floods due to subsidence caused by high levels of groundwater extraction [5]. This was reflected during floods of 2011 in Bangkok which impacted not just the local economy but also disrupted the global scale industrial supply chains [20]. Construction of cities within floodplain of rivers reduces their storage and blocks floodway whereas in low lying cities in coastal areas, drainage becomes difficult without pumping. Delhi is no exception to this fact with some variations in its topography. Although Delhi is not close to any coast yet modifications in the existing land use land cover pattern has resulted in floods within Delhi which can result in rapid loss of development gains and failure of emergency responses even in the most resource-endowed societies (Mitchell, 1996).

Clearly, all these point to a future where disasters seriously threaten a country's population, national security, economy and its sustainable development. Increasing risk from disasters calls for immediate preparedness and mitigation measures to safeguard people from huge damage and loss from future disasters. According to Nadian et al. [25], disaster preparedness refers to initiative intended to increase the readiness and knowledge among the staff and community towards a disaster that is likely to happen in a particular area. Existing research on preparedness highlights the need for engaging the communities in risk and mitigation activities, rather than just expecting them to respond to passive information sources (Eriksen and Prior, 2011). In order to engage communities in preparedness activities, institutional structure for disaster management especially at the local level needs to be made explicit, particularly about their roles and responsibilities. Further, with existence of a complex administrative structure and differential system of command and control, accountability becomes a challenge. Moreover, some aspects of flood response are pursued just as a voluntary activity and not mandated by law to be followed by all concerned institutions.

### 1.2. Role of local institutions in disaster management

Although the existing literature stresses on the important role played by local government in introducing, managing and implementing disaster risk reduction initiatives (Kusumasari, 2012, [22]), however local level institutions have still been understudied in the developing countries. In present day, attention is being paid to local governments in managing disasters [21] since they play an active role in disaster related activities by implementing them [29].

Overlooking the local context and the complexity of the social interplay between the local communities and the institutions, can hamper the initiatives undertaken for reducing disaster impacts. It is the local communities and not the national authorities which are always the first to respond to any kind of a disaster [1,3,35]. In similar manner, Waugh and Streib [34] emphasise on the significant role played by communities and agencies in the context of metropolitan areas since emergency and disaster management rely on local capacity. Thus, institutions' survival in disaster depends on effective and efficient preparation well in advance for prompt response and strategic recovery. To achieve this, Cheong [10] suggests that central and local institutions should work together to develop a comprehensive disaster management framework for reducing the vulnerability towards disasters. Taking all the above into account, this exploratory study attempts to identify the key issues and challenges faced by the institutions engaged in disaster management in Delhi in order to reduce the potential

impact from future disasters. It is an in-depth study which contributes to a better understanding of the strengths and shortcomings of the institutions engaged in managing disasters from national to local level.

## 2. Disaster management framework in India

As per the National Disaster Management Authority of India, floods on an average every year, contribute to loss of 1600 lives affecting 7.5 million hectare of land with overall economic loss of 18.05 billion, rupees. According to CRED records, floods of 2012 brought havoc to states of Assam, Uttarakhand and Himachal Pradesh claiming many lives and causing huge damage to property and infrastructure. Disaster impacts are experienced not only on a local scale but also at the community level depending on the hazard and individual social context [30,33]. This points to the need to bring the community and government to effectively plan and work together for improved preparedness and response [26].

In India, disaster management has evolved from being reactive to proactive with a focus on mainstreaming disaster management into development planning. Following the Orissa Super Cyclone of 1999 and Gujarat Earthquake of 2001, Government of India (GoI) enacted the Disaster Management Act in 2005 with the aim of providing comprehensive institutional, legal, financial and co-ordination mechanisms following a hierarchical structure extending from national to local level but it has failed to clearly specify the roles and responsibilities of local level bodies and the community during a disaster situation. The institutional framework of disaster management in India with linkages with different institutions is shown in Fig. 1.

Disaster management in India extends from national to local level involving multiple stakeholders. In this structure, each preceding level guides the activities and decision making at the next level in a hierarchical manner. The relationship amongst various institutional stakeholders at different levels is important since they are interlinked with each other in terms of their roles and functions as shown in Fig. 1. DM Act of 2005 and National Policy on Disaster Management, 2009 define the functions to be performed by stakeholders involved in managing disasters at all the levels. In a crisis situation, these institutions are assisted by various other departments and line ministries to undertake Emergency Support Functions (ESF).

At the national level, National Disaster Management Authority (NDMA) headed by the Prime Minister is the apex body for co-ordinating and implementing preparedness and response activities. Followed by, State Disaster Management Authority (SDMA) headed by the Chief Minister, which lays down plans and policies for disaster management in accordance with the guidelines issued by NDMA and ensures that guidelines are followed by district authorities, line ministries and departments handling disasters. District Disaster Management Authority (DDMA) is headed by the District Magistrate/Collector who plays the role of directing, supervising and monitoring relief measures for disaster prevention and response. Authorities which rest at the bottom of the disaster management framework are the local authorities such as urban local bodies (ULB) like municipalities, panchayati raj institutions (PRI), district board, cantonment board, town planning authority or Zila Parishad. They are assigned the responsibility of training their officers and employees for disaster management and for carrying out relief, rehabilitation and reconstruction activities in the affected areas in accordance with the state and district plans. Further, they have been assigned the responsibility to ensure the maintenance of the existing resources for availability during disaster situation.

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