
# URBANISATION AND NATURAL DISASTER: IMPLICATIONS OF EVIDENCE FOR SOUTH ASIA

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## CONTEXTUALISATION-NEPAL

The ten studies investigating the intersection of urbanisation and disaster in Nepal were selected from the EPPI-Reviewer database, coded and analysed to produce this brief synthesis. With eight out of the ten studies, education and training emerged as the strongest theme in the studies. Improving preparedness for disasters was the next strongest theme with seven of the studies underscoring the importance of preparedness. Five of the articles found that the strength of governance mechanisms such as support and management by government agencies were important determinants of disaster impact. The role of the community and a sense of community were also found to be an important process in four of the studies. Local knowledge as a coping mechanism that can reduce vulnerability to disasters was a key theme in three of the studies.

### EDUCATION

Education is the most important theme emerging from the Nepal disaster literature. It is used as a blanket theme to cover a wide range of learning and information sharing which is deemed necessary for effective disaster risk reduction. Dewan (2015) implores the need for policymakers to understand local knowledge in order to adequately prepare for floods. Education also includes the need to educate people on the risks of natural disasters where they live (typically landslides, floods, and earthquakes) and how to prepare for them (Aryal, 2014). There is also a focus on the need to educate local people in first aid and disaster search and rescue (as the current reliance on foreign aid and USAR workers is not adequate) (Peleg, 2015). Furthermore, education encompasses the need for widespread and uniform methods of assessing the structural integrity of buildings in urban areas in the wake of natural disasters (focusing on a government funded education of specific individuals to carry out this job) (Thakur and Saito, 2008). Lastly, adequate education and understanding of seismic risk in order to use appropriate building materials in construction is integral to effective disaster risk reduction (Chaulagain et al., 2015).

### PREPAREDNESS

Preparedness is also an important theme in the Nepal disaster literature. Studies demonstrate that with effective preparedness strategies in place, Nepal can take measures to lessen the overall impact of a disaster. Preparedness is particularly important for disasters that can be completely avoided (Dewan, 2015). Preparedness efforts must be adapted continuously and involve an understanding of what factors produce risk (Carpenter and Grünewald, 2015). As such, preparedness cannot be considered in a vacuum. Aryal (2015) utilizes a number of case studies to represent the negative effects of a lack of preparedness for disasters. Aryal (2012) and Chaulagain et al., (2015) also look at the history of disaster incidents and seismic risk in Nepal in order to map out future disasters. Thakur and Saito (2008) suggest a framework to assess the integrity of buildings prior and post earthquakes in order to mitigate earthquake damage as well as damage from buildings in the aftermath of an earthquake.

## GOVERNANCE

The role of governance in Nepal has also been found to be a contributing mechanism for more effective disaster risk reduction. There has been a formal governmental policy aimed at dealing with disasters in Nepal since 1982 (Aryal, 2014). The literature had some slightly varied perspectives of the government. Aryal (2014) utilised case studies to exhibit the lack of government support in relieving vulnerability, particularly in displaced communities. Other studies (Aryal, 2014; Carpenter and Grünewald, 2015; Dewan, 2015) collectively state that governmental efforts need to be combined with local knowledge from the community in order to be effective. It appears unanimous that disaster risk reduction should not be a top-down endeavour in Nepal. However, it is clear that whilst a top-down approach is inappropriate, the role of the government is still imperative in mobilising community relief efforts, rather than the community relying completely on self-reliance (Jones et al., 2013).

## COMMUNITY

A strong sense of community is an important disaster management theme within the Nepal literature. Bhandari et al. (2011) identifies the key role that urban ritual events play in building resilience and preparedness to disasters. This study also calls for possible collaboration between ritual organisers and community based disaster risk management teams in order to effectively mitigate disaster risk at a local level. Jones et al. (2013) argue that bottom-up disaster policies and increased community involvement are the most effective option for resilience building. However, local governance is no substitute for the broad policies needed to create conditions that will reduce inequality, poverty, and social exclusion in Nepal (Jones et al., 2013). Furthermore, Peleg (2015) states that there needs to be a shift from reliance on professional USAR teams to promoting a prepared community. This is effective as local residents will be close to the scene and highly motivated to respond. By enlisting community volunteers and utilizing locally available equipment, it would be possible to teach basic SAR techniques to large numbers of people (Peleg, 2015).

## LOCAL KNOWLEDGE

Local knowledge was a central theme across three of the Nepal articles. Aryal (2014) acknowledges the importance of local knowledge being shared with displaced individuals in order to reduce their vulnerability. In Nepal, it was evident that there is a lack of local knowledge within displaced communities and a general absence of knowledge sharing between locals and displaced communities. The formation and strengthening of bonds between communities and the relocated will assist in community disaster risk reduction. Bhandari et al. (2011) examined the local knowledge gained from rituals and religious events in heightening individual resilience and lowering vulnerability through access to support and resources. Dewan (2015) establishes the importance of local knowledge being integrated with outside support in order to cope effectively during natural disasters , arguing that local knowledge is the most valuable aspect of any disaster management plan. Particularly in urban areas, it is crucial that new scientific processes and policies incorporate traditional and local knowledge (Dewan, 2015).

## CONTEXTUALISATION – BANGLADESH

The 23 studies investigating the intersection of urbanisation and disaster in Bangladesh were selected from the EPPI-Reviewer database, coded and analysed to produce this brief synthesis. With 19 out of the 23 studies, governance emerged as the strongest theme in the studies. The economic effects of disasters were the next strongest theme with 18 of the studies examining the complex consequences to the economy. Sixteen of the articles found that poverty and slums are important determinants of disaster impact and vulnerability. Climate change is also an important emerging theme with 15 of the studies acknowledging the effects it will undoubtedly have on Bangladesh. Lastly, scientific knowledge and the use of early warning systems was another theme underscoring 13 of the studies.

### GOVERNANCE

Governance was the most prevalent theme in the Bangladesh studies with 19 studies addressing it. Governance is key to effective mitigation of water-related natural disasters (Adikari et al., 2013). Good governance is imperative in areas such as Bangladesh where disasters are predictable and a recurring feature of the area (i.e. floods) (Adikari et al., 2013). Effective governance drives preparedness and adequate responses to disasters, which reduces loss of life (Adikari et al., 2013). Post-disaster, the government and NGOs provide free food to the local shelters (Braun and Aßheuer, 2011). However, women are given very limited support from the government (Alam and Rahman, 2014). The majority of people affected by floods receive financial help and loans from non-governmental/institutional sources such as family and friends (Jahan, 2000). This points to an institutional failure in disaster relief as many slum residents claimed the government assistance was insufficient (Rashid, 2000).

Alam and Rabbani (2007) looked at the measures the government has taken in Dhaka toward flood mitigation. Poor governmental management of urbanisation and population growth has exacerbated disaster risk in Bangladesh (Adikari et al., 2010). Urban governments in Dhaka appear to lack the initiative for adequate disaster mitigation and are fundamentally unaware of how climate change will likely impact the city (Ahammad, 2011). It is imperative that climate change risks are factored in to future urban planning for the city (Ahammad, 2011). Traditional and indigenous knowledge should also be integrated with governmental initiatives for a holistic approach to disaster risk reduction (Dewan, 2015).

### ECONOMIC EFFECTS

The economic consequences of disasters were another theme in the Bangladesh papers (n=18). In recent times, loss of life is decreasing but the number of disasters, the people affected and the economic loss are increasing exponentially (Adikari et al., 2010). Dhaka has faced three major floods in the last 20 years, causing huge economic loss and lasting damage to the economy (Alam and Rabbani, 2007). Key sectors of industry, trade and commerce in Bangladesh are highly vulnerable to floods (Alam and Rabbani, 2007). The industries and factories are generally forced to shut down operations during floods as the floodwater disrupts physical and mechanical functionality (Alam and Rabbani, 2007). Furthermore, the high economic cost of adequate flood mitigation measures has impeded their implementation (Ahmed et al., 2015). If an earthquake were to hit in the Dhaka area,

it would have an unprecedented and devastating impact on the economy (Paul and Bhuiyan, 2010). More importantly, the economic and political dominance of Dhaka would ensure that the effects of any earthquake would be extremely far reaching (Paul and Bhuiyan, 2010). Bangladesh loses an estimated US$175 million annually due to water-related disasters (Masuya et al., 2015). This is severely suppressing its economic progress. Disaster preparedness can avoid extensive economic losses (Ahmed, 2015).

## SLUMS/POVERTY

Slums and poverty are another theme in the Bangladesh papers (n=16). Rapid urbanisation and an increasing population is causing a dramatic rise in slums and overall poverty in Bangladesh (Adikari et al., 2010). Unplanned urbanisation in Bangladesh has resulted in 3.4 million slum dwellers, compared to only 1.5 million in 1996 (Dewan et al., 2012). As disaster resilience depends heavily on socioeconomic capacity, it is unanimous amongst the literature that those living in slums will be the worst affected by natural disasters. Many slums are at high risk during flooding due to their locations on low-lying land, riverbanks, and on the outskirts of cities (Adikari et al., 2010; Braun and Aßheuer, 2011). The majority of the slums have poor sewage and drainage and inadequate water supplies (Rashid, 2000). This is clearly problematic in a flood prone country like Bangladesh. However, slum dwellers are surprisingly resilient during disasters and tend to recover relatively quickly (Braun and Aßheuer, 2011).

## CLIMATE CHANGE

Climate change is an important emerging theme in regards to Bangladesh in particular. This is primarily due to the fact that climate change will affect Bangladesh disproportionately greater than that of many other more developed countries, despite Bangladesh's extremely limited greenhouse gas emissions (Haque, 1997). The poorest nations in the world will be the hardest hit by the effects of climate change (Tanner et al., 2007). Furthermore, it is almost unanimous throughout the literature that climate change will increase the severity and frequency of natural disasters in Bangladesh. Rapid, unplanned urbanisation combined with climate change is increasing vulnerability in Bangladesh (Ahammad, 2011). Climate change also acts to further exacerbate disaster risk in urban settings (Ahammad, 2011). There has been worryingly little research on the likely impacts of climate change in Bangladesh and subsequently very little information for adaptation available to the government (Ahammad, 2011).

Climate change is likely to cause more frequent and intense flooding (Braun and Aßheuer, 2011). The impacts of climate change will also disproportionately affect vulnerable populations such as women, children and low socioeconomic populations (Dhakal and Mahmood, 2014; Alam and Rahman, 2014). The current flood mitigation plans in Dhaka were formulated under the assumption of a static climate. As such, climate change will render these mitigation efforts obsolete (Masuya et al., 2015). Adaptation to climate change ought to be an integral aspect of all development plans in Bangladesh (Ahmed et al., 2015). Integrated climate change action is needed across all sectors in Bangladesh, as its effects will be felt across all areas (Ahammad, 2011).

## SCIENTIFIC KNOWLEDGE/EARLY WARNING SYSTEMS

The importance of scientific knowledge and early warning systems was also a contributing theme in the Bangladesh papers (n=13). Knowledge sharing of scientific process between developed and developing countries is helpful in strengthening disaster risk reduction (Adikari et al., 2013). Remote sensing applications are important to developing countries due to the limited feasibility of traditional methods (Dewan et al., 2007). Jahan (2000) suggests a cooperative network between Bangladesh and developed countries would be particularly useful for mapping and modelling. However, many methods used in developed countries may not be possible in Bangladesh due to lack of initial data and limited access to data sources (Dewan et al., 2007). Early warning systems can be complex and their success often depends on the responses of the people (Haque, 1997). As such, early warning systems should be understood as a facet of a broader disaster preparedness plan (Haque, 1997).