The Role of Government, NGOs and Developers in Revolutionizing Technology for Increasing Resilience to Natural Disaster in Bangladesh.

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Due to the geographical location and geology, Bangladesh is a disaster-prone, low-lying country which lies on the Ganges delta in Southeast Asia. The country is highly vulnerable to natural hazards such as flood, cyclone, drought and earthquake and issues like climate change and high population density can worsen their impacts. The buildings in the urban areas, such as the capital city of Dhaka, are vulnerable to earthquake as the building codes were not followed by most developers and owners during the time of development. At 2016, Bangladesh already experienced two large earthquakes with an intensity of 6.9 on the Richter scale and it is estimated that around 60% to 80% of buildings will be destroyed in Dhaka if the intensity is 8. Bangladesh, as a developing nation, faces a huge challenge in managing natural disaster due to a dense population and a weak economy. But It is evident that Bangladesh has done considerably well in increasing resilience and improving relief when impacted by major cyclones as the number of deaths due to the recent major cyclones Sidr (2007) and Aila (2009) were reduced by 99.2% from the number of deaths from the devastating cyclones of 1970 and 1991. This is a great example of how rapidly and effectively the government and communities of a nation can adapt with natural disasters and move forward for a sustainable development.

The resilience of the country to natural disaster is an essential part of sustainable development and after the outset of the Sustainable Development Goals; Bangladesh has been improving the use of technology for disaster management. In this study, we examined how the government, NGOs and Developers are using different technologies to govern disaster management in Bangladesh for increasing resilience. Unstructured interviews were taken from representatives of different government bodies such as the ministry, departments and government developers as well as NGOs and private developers to get the information about the use of different types of technologies in tackling different types of natural hazards.

The results showed that the use of modern IT, ICT and simulation based technology have been revolutionized and increased in the recent years by the government and NGOs in Bangladesh which is functional to provide early warnings for cyclones and floods. Furthermore, the purchase of high technology equipments is also considered in this year's budget of the government for search and rescue operations on earthquakes and other disasters and the fire and civil service workers will be trained to use them. The technology already being used widely is Geographical Information System (GIS) for creating flood hazard maps, earthquake maps, flood vulnerable analysis, etc. The unstructured interviews with the developers reflected that the government is using research technologies to recreate earthquake tolerable building codes and making the laws stricter for effective implementation, though it will be a great challenge due to the lack of knowledge and awareness of developers and land owners. Bangladesh

Meteorological Department has also increased and improved the use of technology in recent years, which will help in tracking climate change.

Though there is a gradual increase in the use of technology for disaster management in Bangladesh, it is not sufficient in regards of the population and hazard risks. It is important to increase the budget for this purpose and international donations are needed. Furthermore, there is a shortage of skilled IT and other technology professionals in the country as well as training centers and therefore more training are needed to work with the equipments and IT technology for disaster management.