

Innovation in Research on Disaster and Global Sustainability: The Role of Geospatial Technology and Participatory Capacity Building in India

R.B. Singh

*Head, Department of Geography, Delhi School of Economics, University of Delhi, Delhi – 110007
(INDIA); e-mail: rbsgeo@hotmail.com*

Abstract

Disasters are threat to the development process and sustainability of future earth particularly in developing world. Global Economic losses from natural disasters have increased nine-fold over the last 40 years and produced \$192 billion in 2013. The four dimensions of Sustainable Development viz. economic efficiency, social equity, environmental protection and institutional effectiveness, all four of which contribute to, and are affected by natural disasters. Traditionally, disaster management consisted primarily of relief based reactive mechanisms. However, the past few years witnessed a gradual shift towards a more proactive, mitigation-based approach. The advancement in geospatial technology has helped in mitigating the risk of natural as well as man made disasters. Innovative geospatial techniques like Hazard zonation, mapping and vulnerability analysis in a multi-hazard framework has been carried out utilizing Geographic Information System (GIS) for mitigating risks and achieving sustainability. India is vulnerable, in varying degrees, to a large number of disasters. Over 40 million hectares (12 per cent of land) is prone to floods and river erosion; of the 7,516 km long coastline, close to 5,700 km is prone to cyclones and tsunamis; 68 per cent of the cultivable area is vulnerable to drought and hilly areas are at risk from landslides and avalanches. With urbanization and concentration of population in metropolitan cities, more and more people are becoming vulnerable to region specific disasters. The recent innovation in research for Himalayan ecosystem has identified many Glacial Lake Outburst Flood events through use of geospatial technology in Himachal Pradesh. The climate variability and shift in climatic belts has been assessed, along with change in aridity in desert area of India. The drought vulnerability assessment in arid regions of India through use of GIS helps in prioritization of planning. The innovative geospatial technology has also helped in identifying the existing and potential hotspots of Urban Heat Island in mega cities of India. Environmental considerations and developmental efforts need to go hand in hand for ensuring sustainability. Restoration of ecological balance in Himalayan regions and raising shelterbelt plantations in desert areas has been suggested to be incorporated in Disaster Management Plan for capacity building. Major factors that play significant role to protect from disasters are prediction, insurance and structural reinforcement. The impact of recent Phailin cyclone in Orissa was reduced successfully through combined efforts of Geoscience and Good Governance. The impact was mitigated by containing death toll to 44 by evacuating 1,154,725 people. National Institute for Disaster Management (NIDM) has empowered local authorities through

District and Village disaster management plans. The Government of India has incorporated participatory mapping of resources, risk and vulnerability, and safe routes in community based disaster management. The programmes like MNREGA with prime objective of providing employment has also been effective in disaster proofing through water body restoration, afforestation and land reclamation activities. The recently approved Food Security Bill aims to reduce the socio-economic vulnerability by ensuring food supply even in stress conditions. During 2003-2004, India took a pioneering step of starting disaster management education as part of social sciences at school level for capacity building. The knowledge management initiative of Government of India involves a web portal to facilitate the knowledge collaboration between the network members. The portal provides tools to capture or acquire and organize knowledge. It also provides facility to find and share knowledge through the portal. The Eleventh Five Year Plan (2007-2012) has stated that development process needs to be sensitive towards disaster prevention, preparedness and mitigation. Disaster management has therefore emerged as a high priority for sustainability of the world in general and Developing Countries in particular, which need to be achieved through innovative research using geospatial technology. The future research initiatives for sustainability need to be appropriate, indigenous and solution-orientated. It should be accessible with effective interdisciplinary collaboration. The future research should also focus on increasing capacity building through participation of local level policy-makers, academicians, industrial establishment and other sectors of civil society in science, technology and innovation, especially in developing countries.