

Climate change will pose new challenges to disaster management

Natural hazards are purely natural but climate change may exacerbate it. Anthropogenic interventions convert hazards into disasters. Climate change and natural disasters should be dealt with mutually and not in isolation. Disaster mitigation and preparedness are necessary for a sustainable growth of any society. It has also been observed that the numbers of people killed due to disaster are more in the places where human development is low. Hydrometeorological disasters cause more damage than those which are of geophysical in nature. Climate change is one of the most important global environmental challenges faced by humanity. The Intergovernmental Panel on Climate Change (IPCC) in its fourth assessment report (AR4) released during February 2007, has mentioned that eleven of the last twelve years (1995–2006) rank among the 12 warmest years in the instrumental record of global surface temperature. Global average sea level rose at an average rate of 1.8 mm/yr over 1961–2003. Even if the concentrations of all greenhouse gases and aerosols had been kept constant at year 2000 levels, a further warming of about 0.1°C per decade would be expected. In case of temperature rise, the best estimate for a low scenario is 1.8°C and the best estimate for a high scenario is 4°C. It is expected that the earth will be confronted with frequent warm spells, heat waves and heavy rainfall. This unprecedented increase is expected to have severe impact on the global hydrological system (receding glaciers, erratic monsoon), ecosystems, sea level, crop production and related processes. The impact would be particularly severe in tropical areas mainly consisting of developing countries, including India. With rapid development of

coastal areas, industrialization and urbanization, more populations are becoming vulnerable to climate-associated calamities and many have no choice but to move to safer places. It is estimated that approximately 142 million people may inhabit coastal India in 2050 and India's total number of flood zone refugees alone could be anywhere between 20 and 60 million, with 30 million taken here as a conservative working figure¹.

Climate change is a global problem and India will also feel the heat. Nearly 700 million rural people in India directly depend on climate-sensitive sectors (agriculture, forests and fisheries) and natural resources (water, biodiversity, mangroves, coastal zones and grasslands) for their subsistence and livelihood. Under changing climate, food security of the country might come under threat. In addition, the adaptive capacity of dry-land farmers, forest and coastal communities is low. Climate change is likely to impact all the natural ecosystems as well as health (e.g. malaria) and socio-economic systems, as shown by the India's initial national communication to the UNFCCC (United Nations Framework Convention on Climate Change). To manage these climate change-induced disasters, the country needs to have improved scientific understanding, capacity building, networking and broad consultation processes across every section of the society.

Further, human activities that contribute to deforestation, land degradation and climate change not only result in huge losses to the environment, but also increase the vulnerability of the environment to disasters and alter the resilience of the natural environment by reducing its ability to recover effectively from damage.

Disaster and climate change are increasingly being considered as a development constraint; hence, mainstreaming them into the development policy is all the more pertinent in the current context. Researchers and policy makers across the world understood the importance of this. The Hyogo Framework of Action: Building the Resilience of Nations and Communities to Disasters 2005–15 is the result of that realization which recommends (para 32(e)) 'to integrate disaster risk reduction (DRR) considerations into development assistance frameworks...'. DRR should become a normal practice and become a basic development agenda for our country. A systematic approach towards disaster mitigation is the need of the day. Since disasters are a human phenomenon, we can change our ways to reduce our risks. Shifting of focus from hazards to risk management could make our life safer. There is a need to have a paradigm shift in disaster management especially under changing climate. Initiatives such as adaptation to changes, disaster auditing, cross-sectoral risk analysis, regulatory authority (legal framework), knowledge management (community awareness), training and capacity building, training of media personnel, coastal zone management, private-public partnership (PPP), research and development, and last but not the least, establishing rewards or incentives for good management could be undertaken.

1. Myers, N., *Bioscience*, 1993, **43**, December.

SUDIP MITRA

*M.S. Swaminathan Research Foundation,
Chennai 600 113, India
e-mail: sudipmitra@yahoo.com*

Need for a comprehensive eco-friendly approach for development

In India, vast stretches of land are lying barren. These could be brought into use by an eco-friendly approach. The land-use ratio of forest, agriculture, industry, commerce, housing, etc. should be such that it is in perfect harmony with nature. In this connection, the following points

may be noted. (i) Some of the land may be earmarked for forests. In fact, every human settlement (i.e. village or township) should be accompanied by the 'Deorai' (i.e. forest comprising of trees of different species). Planting trees of different species would help in combating

the so-called global warming by releasing oxygen from the enhanced carbon dioxide. They provide raw material for the manufacture of medicines. They also help counter degradation and/or desertification of the land and keep biodiversity intact. (ii) Some portion of the