COURSE : DISASTER MANAGEMENT (MA/MSc PART I)
Paper : I
Prepared by : Prof. B. K. Mishra, Course coordinator
Topic : Disaster Impacts Model

Disaster impacts model

The basic framework of disaster research can be summarized in Figure 2, which indicates that the effects of a disaster are determined by three pre-impact conditions – hazard exposure, physical vulnerability and social vulnerability. There also are three event-specific conditions – hazard event characteristics, improvised disaster responses and improvised disaster recovery. Two of the event-specific conditions, hazard event characteristics and improvised disaster responses, combine with pre-impact conditions to produce a disaster's physical impacts.

Physical impacts, in turn, combine with recovery actions to produce a disaster's social impacts. Communities can engage in three types of emergency management interventions to ameliorate disaster impacts. Physical impacts can be reduced by hazard mitigation practices and emergency preparedness practices, whereas social impacts can be reduced by recovery preparedness practices.

Of the three pre-impact conditions, hazard exposure arises from people's occupancy of geographical areas where they could be affected by specific types of events that threaten their lives or property. Physical vulnerability includes human vulnerability, agricultural vulnerability and structural vulnerability. Human vulnerability arises from humans' susceptibilityto environmental extremes of temperature, pressure and chemical exposures that can causedeath, injury and illness. Agricultural vulnerability exists because, like humans, plants and animals are also vulnerable to environmental extremes.

Structural vulnerability arises when buildings are constructed using designs and materials that are incapable of resisting extreme stresses (e.g. high wind, hydraulic pressures of water, seismic shaking) or that allow hazardous materials to infiltrate into a building where people are sheltering. The concept of social vulnerability (e.g. Wisner et al., 2004) represents an important extension of previous theories of hazard vulnerability (Burton et al., 1978). Whereas people's physical vulnerability refers to their susceptibility to biological changes (i.e. impacts on anatomical structures and physiological functioning), their social vulnerability refers to limitations in their physical assets (buildings, furnishings, vehicles) and psychological (knowledge, skills and abilities), social (community integration), economic (financial savings) and political (public policy influence) resources.

Of the three event-specific conditions, hazard event characteristics can be defined in terms of six attributes – speed of onset, availability of perceptual cues (such as wind, rain, or ground movement), the intensity, scope and duration of impact, and the probability of occurrence (CDRSS, 2006; Kreps, 1984). These characteristics determine people's ability to detect hazard onset, the amount of time they have to respond, the number of affected social units and – thus – the event's casualties, damage and socioeconomic disruption. The other two event-specificconditions, improvised disaster response and improvised disaster recovery, are addressed later on.