Paper name: Environmental Geography and Disaster Management

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Topic: Risk Analysis

Concept and Definition

Disaster/Hazard risk is defined as likely adverse impacts of a particular hazard on different aspects, such as social, economic, political, medical, psychological, etc., of human society.

According to **C. J. Barrow (2005)**, "*A risk (of hazard) is the probability that a hazard will happen or, more precisely, the likelihood that an event will coincide with the elements which can be affected*".

UNDP defines risk as "*the probability of harmful consequences- casualties, damaged property, lost livelihoods, disrupted economic activity, and damage to the environment- resulting from interactions between natural or human-induced hazards and vulnerable conditions*". Risk assessment is a process to determine the nature and extent of such risk, by analyzing hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend. A comprehensive risk assessment not only evaluates the magnitude and likelihood of potential losses but also provides full understanding of the causes and impact of those losses. Risk assessment, therefore, is an integral part of decision and policy-making processes and requires close collaboration among various parts of society.

Since hazard/disaster risk is a probability of likely adverse impacts of a particular hazard on society, it is full of uncertainties in terms of magnitude and severity of a hazard, speed, quantum of likely damage, duration of persistence of disaster etc.

Disaster risk has different connotations and definitions in different disciplines, for example, environmental science, ecology, economics, engineering and technology, toxicology, etc. A few examples are given below:

According to common connotation disaster risk is defined as:

(H) hazard x vulnerability (V)

Or

According to emgineers and technocrats, disaster risk becomes the product of the following:

(P) probability (of occurrence of a hazard) x (C) consequences (of a hazard)

or

P x C

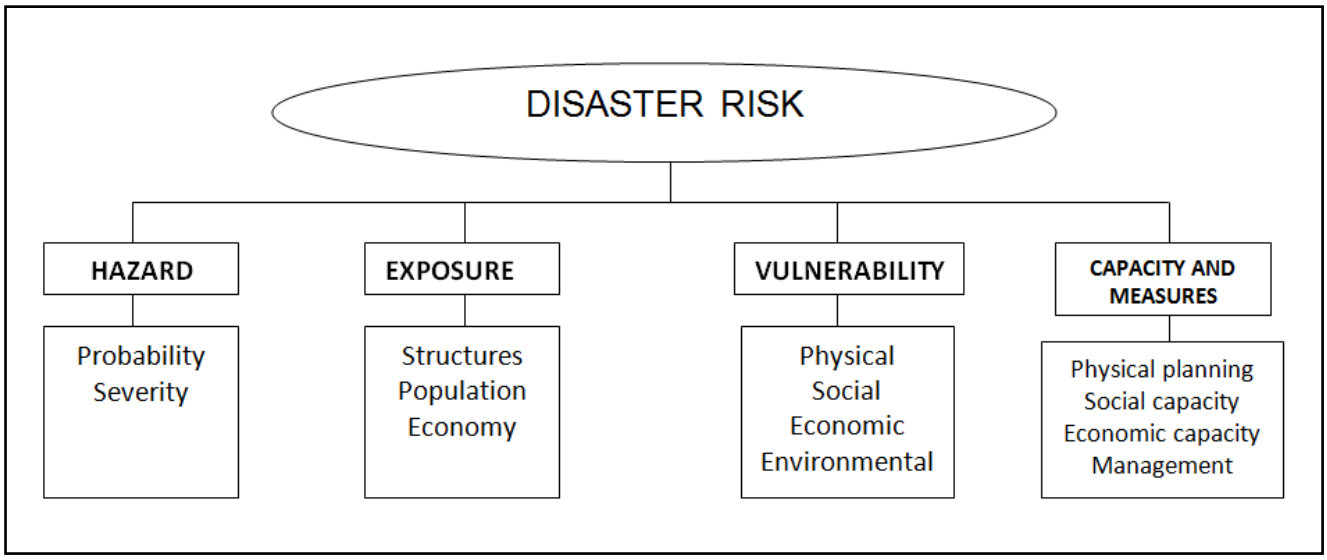

Fig.: Disaster risk model

Risk Management

Hazard/disaster risk is viewed in terms of human health and wealth; or it is viewed in terms of environment and nature.

The risk management, very significant aspect of natural disaster reduction and management, includes the following aspects:

- risk identification,
- risk assessment,
- risk perception assessment,
- determination of risk magnitude,
- risk communication (risk information)
- risk responses and risk takers,
- Risk acceptability,

- risk avoidance,
- risk mitigation, etc.

For UNDP, a comprehensive risk assessment consists of the following steps:

Step 1: Understanding of current situation, needs and gaps to assess what already exists, avoid duplication of efforts, and build on existing information and capacities. This is done through a systematic inventory and evaluation of existing risk assessment studies, available data and information, and current institutional framework and capabilities.

Step 2: Hazard assessment to identify the nature, location, intensity and likelihood of major hazards prevailing in a community or society.

Step 3: Exposure assessment to identify population and assets at risk and delineate disaster prone areas.

Step 4: Vulnerability analysis to determine the capacity (or lack of it) of elements at risk to withstand the given hazard scenarios.

Step 5: Loss/impact analysis to estimate potential losses of exposed population, property, services, livelihoods and environment, and assess their potential impacts on society.

Step 6: Risk profiling and evaluation to identify cost-effective risk reduction options in terms of the socio-economic concerns of a society and its capacity for risk reduction.

Step 7: Formulation or revision of DRR strategies and action plans that include setting priorities, allocating resources (financial or human) and initiating DRR programmes.

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