Digitized Vulnerability Atlas of South Asia Integrating Spatial Data on Physical, Demographic and Socio-Economic Features of Different Regions of Each Country

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## $D = (H+R) \times V$

HAZARDS - A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

RISKS - The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions.

VULNERABILITIES - Factors or processes, physical, social, economic, and environmental, which increase the susceptibility of an area or a community to the impact of hazards

**DISASTER** - A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources.

### South Asia: Hazards of Nature

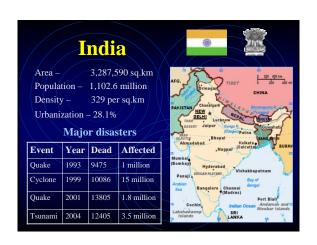
- Largest, youngest and most seismic active mountain system in the world
- Largest non-polar glacial deposits melting due to effects of global warming
- Heavy rainfall and high silt load on water bodies causing recurrent flood over large areas
- Larger area facing droughts due to scanty rainfall and depleting ground water level
- 12000 km coastline and many islands threatened by cyclones, storm surge and sea level rise

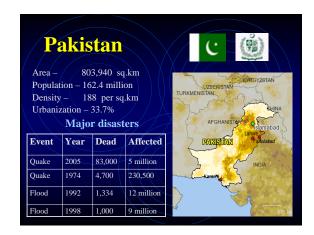
#### Layers of vulnerabilities

- With 23% of world population, South Asia produces only 1.3% of world income
- 40% of world poor (500 million) live in South Asia
- Half of malnourished children belong to South Asia
- 46% of world illiterates also belong to South Asia
- South Asia has the lowest sex ratio reflecting deeply rooted gender discrimination in society
- 1.4 billion people of South Asia is still growing at more than 2% per annum
- Unplanned urban areas growing at faster rate of 4.5% per annum creating further layer of urban vulnerabilities

#### Recent mega disasters

|   |             |                 | \       |                 |
|---|-------------|-----------------|---------|-----------------|
| , | Country     | Disaster        | Deaths  | People affected |
| 1 | Bangladesh  | Cyclone 1970    | 300,000 | 20 million      |
| \ | Bangladesh  | Cyclone 1991    | 138,000 | 15 million      |
|   | India       | Earthquake 1993 | 9475    | 1 million       |
|   | India       | Cyclone 1999    | 10086   | 15 million      |
|   | India       | Earthquake 2001 | 13805   | 1.8 million     |
|   | India       | Tsunami 2004    | 12405   | 3.5 million     |
|   | Pakistan    | Earthquake 2005 | 83,000  | 5 million       |
|   | Afghanistan | Drought 2000    | 712     | 2.5 million     |
|   | Sri Lanka   | Tsunami 2004    | 35,399  | 1 million       |





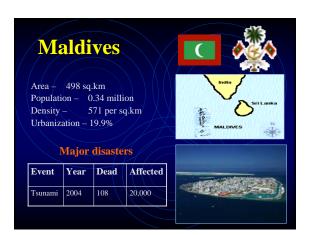












# **Current status of hazard analysis** and risk assessment in South Asia

- Despite progress made in science and technology the current status of hazard and risk analysis in South Asia is not satisfactory
- Latur earthquake exposed weakness of seismic risk assessment
- India developed Vulnerability Atlas in 1996 in respect of four major natural hazards - earthquake, flood, landslide and cyclonebut this was prepared in a scale of 1: 100,000
- Second version of the Vulnerability Atlas released in 2007 in digitized form without difference in resolution
- Few countries acquired satellite imageries in a higher resolution, but integration / verification with ground data/yet to take place
- Micro-zonation of major natural hazards even in high risk zones far from being taken up is systematic manner – no clear road map vet visible

# **Vulnerability Analysis**

- No system in place to integrate wealth of data generated through
  - · Human, animal, agricultural census,
  - · Economic, industrial and manpower surveys,
  - Gender, poverty and disability studies etc
- Isolated examples of spatial data integration
- In the absence of access to scientific tools heavy reliance placed on Participatory Risk Assessment, which are not always appropriate for large scale mega disasters which overwhelm local communities

# **Opportunities**

- Development of satellite technology, remote sensing, GIS/ GPS have opened up enormous opportunities
- It is possible to prepare micro-zonation maps in respect of every natural hazard for every village and city within a definite time frame

# Feasibility Study under SAARC-Japan Cooperation Programme

- Assess current status of hazard analysis, vulnerability mapping and risk assessment in each of the eight countries of South Asia
- Identify strength and critical gaps in infrastructure, resources and capacities in each country
- Develop common format of Vulnerability Atlas for South Asia
- Assess the technical, financial and human resources required for undertaking the study
- Assess time required for the development of the proposed atlas
- Recommend the most appropriate strategy for preparation of Digitized and Vulnerability Atlas Integrating Spatial Data on Physical, Socio-Economic and other related data

## Methodology, costing, outcome

- Core Group of multi-disciplinary experts to oversee
- National Focal Points in each country to coordinate
- All relevant scientific, technical and academic organizations to be associated
- All available resources to be studied, discussions held with concerned organizations and brainstorming workshops organized in each country
- Findings to be validated by ach country
- US\$ 30,000 allocated for the feasibility study
- Study expected to be completed in six months

## What next?

- After the study report is available, SAARC Disaster Management Centre shall develop a Road Map for undertaking the preparation of digitized vulnerability atlas in consultation with the member countries
- Appropriate financial protocol and phasing shall be developed for the exercise.

