

# VULNERABILITY AND RISK ASSESSMENT

*Ms. Sh. Altanchimeg  
VR 2007  
ADRC*

1

## Background

- Adoption of the Law on Disaster Protection, Mongolia (2003)
- Establishment of NEMA (2004)
- Necessity to strengthen national disaster management
  - State Disaster Protection Policy
  - Disaster Preparedness Plans on national and local level
  - Vulnerability and Risk Assessment
- Hyogo Framework for Action Priority 2:
  - Identify, assess and monitor disaster risks and enhance early warning

2

## Contents

- I. Basic Principles and Theoretical Basis
- II. Indicators and Criteria for Measuring Vulnerability
- III. Data for Measuring Vulnerability
- IV. Social Levels and Hazard (In) Dependence in Determining Vulnerability
- V. Vulnerability Indicators in the Example of Germany
- VI. Local Vulnerability Assessment. Community Based Disaster Risk Index: Pilot Implementation in Indonesia
- VII. Risk and Vulnerability Assessment in Japan
- VIII. Conclusion and Recommendations

3

## I. BASIC PRINCIPLES AND THEORETICAL BASIS

UN/ISDR defines *risk assessment* as:

A methodology to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend.

4

Risk assessment process			
R i s k  A n a l y s i s	Identification of Risk Factor		R i s k  A s s e s s m e n t
	Hazard	Vulnerability /Capacities	
	Determines geographical location, intensity and probability	Determines susceptibilities & capacities	
	Estimates level of risk		
	Evaluates risks		
	Socio-economic cost/benefit analysis Establishment of priorities Establishment of acceptable level of risk Elaboration of scenarios and measures		

5

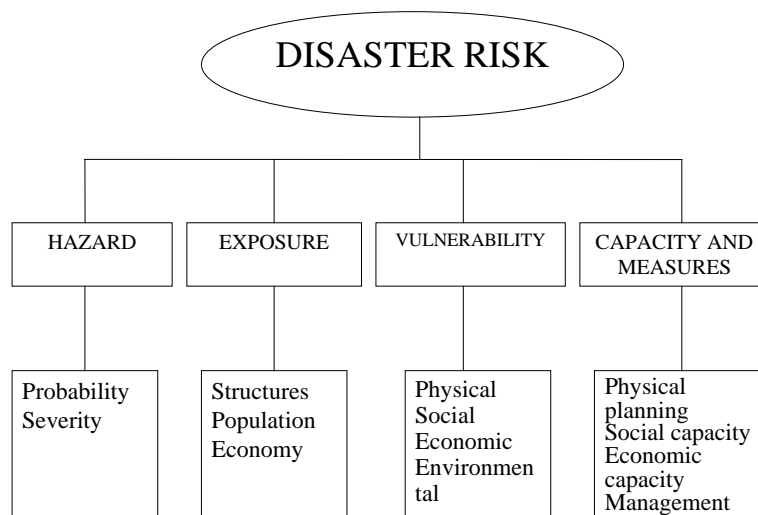
Definitions
<ul style="list-style-type: none"> <li>■ <b>Risk</b> - Probability and the amount of harmful consequences or expected losses resulting from interactions between natural or human induced hazards and vulnerable conditions. (UN/ISDR)</li> <li>■ <b>“Risk of disaster”</b> means probability of possible damage to population, livestock, property or environment posed by disaster; (Law on Disaster Protection of Mongolia)</li> </ul>

6

## Definitions

- **Vulnerability** - *The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. (UN/ISDR)*
- **“Disaster vulnerability”** *means susceptibility of population, livestock, property or environment to disasters. (Law on Disaster Protection of Mongolia)*

7



8

## II. INDICATORS AND CRITERIA FOR MEASURING VULNERABILITY

### *Phases of Indicator Development*

- definition of a goal
- clarifying scope of the indicator by identifying the target group
- the identification of the conceptual framework
- the definition of selection criteria for the potential indicators
- the identification of a set of potential indicators
- evaluation and selection of each indicator
- collection of data
- preparation of a report
- assessment of the indicator performance

9

## Criteria for Selection of Sound Indicators:

- measurable
- relevant to topic and policy
- only measure important key-elements
- analytically and statistically sound
- understandable
- easy to interpret
- sensitive and specific to the underlying phenomenon
- validity/accuracy
- reproducible
- based on available data
- data comparability
- appropriate scope
- cost effective

10

### III. DATA FOR MEASURING VULNERABILITY

- Major problem - the gathering of accurate, reliable and accessible data
  - currently available data (impacts of past disasters)
  - gathering new data (questionnaires; interviews)

11

### IV. SOCIAL LEVELS AND HAZARD (IN) DEPENDENCE IN DETERMINING VULNERABILITY

**Goal** - to specify where and how many people are living at risk of natural disasters and to what disasters they are most vulnerable

12

## The Social Levels of Vulnerability

- individual
- household
- administrative community
- cultural community
- national
- regional.

13

## Hazard - (in) Dependent Vulnerability

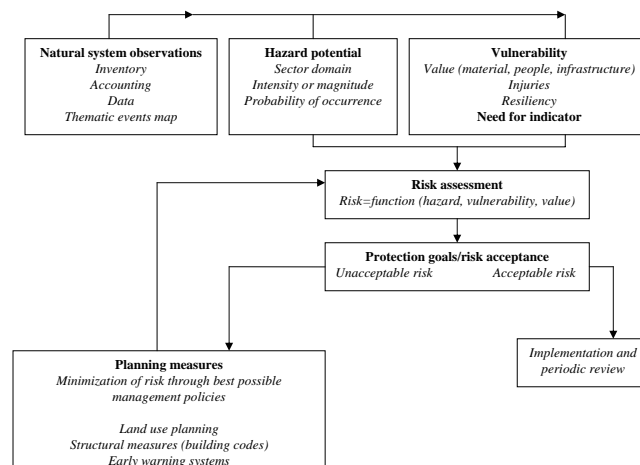
- **Hazard independent parameters** - the strength or weakness of an individual or a people to withstand stresses derived from their exposure to any natural hazard:
  - income, health and education, access to information, the existence of national disaster plans
- **Hazard-dependent parameters** - people's vulnerability to the impact of given hazard:
  - quality of building, construction of dams, social and cultural aspects, such as drought preparedness or the percentage of the population vaccinated

14

## Y. VULNERABILITY INDICATORS IN THE EXAMPLE OF GERMANY

- Vulnerability - the characteristics of a person or a group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural or human-made disaster – noting that vulnerability is made up of many political-institutional, economic and socio-cultural factors (*The Federal Office of Civil Protection and Disaster Assistance in Germany (BBK)*)

15



16



## Vulnerability Indicators

- The local level
- The regional level
- The national level
- Target groups and objects for vulnerability indicators
- Types of disaster

17

## YI. LOCAL VULNERABILITY ASSESSMENT COMMUNITY-BASED DISASTER RISK INDEX: PILOT IMPLEMENTATION IN INDONESIA

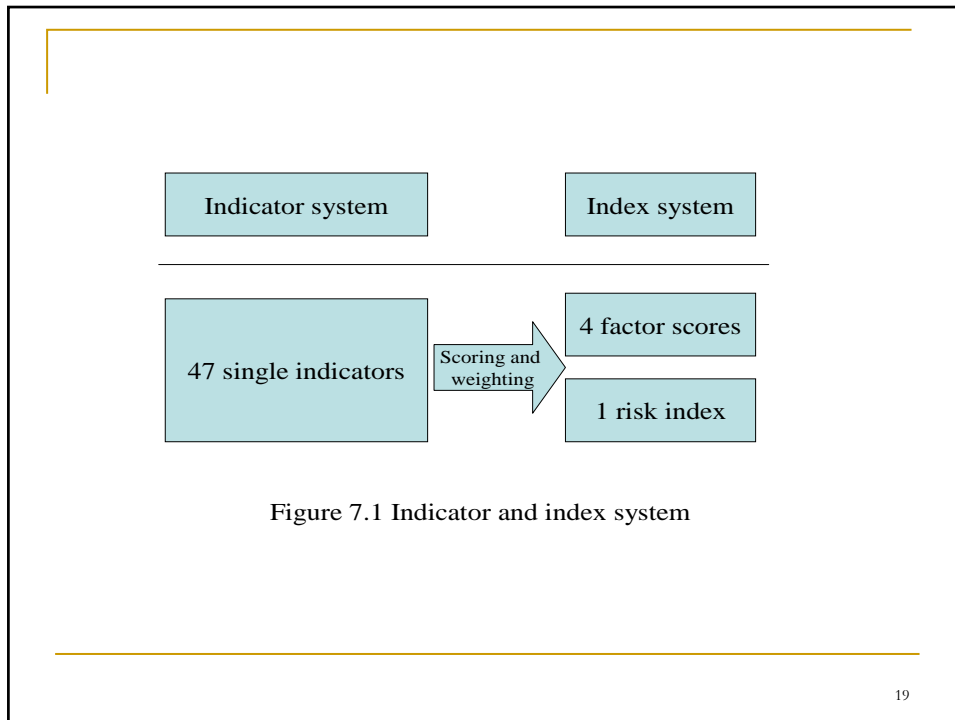
### Disaster Risk Index:

- based on a comprehensive indicator system
- to gather data on local disaster risk
- to identify the main risk aspects in cooperation with the community

Developed a questionnaire

The indicator system - 47 individual indicators

18

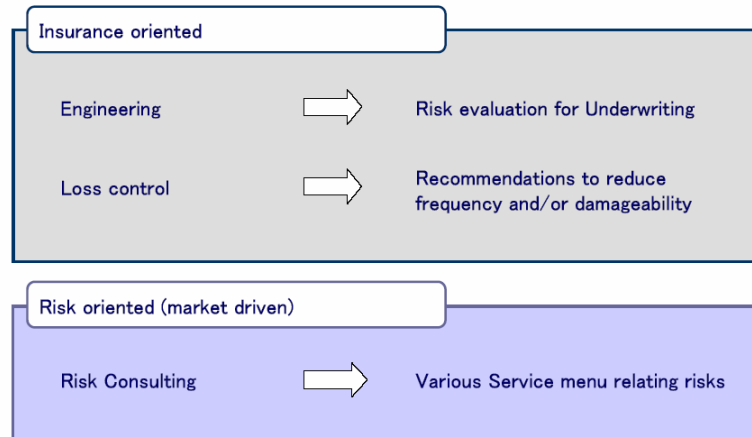


## **YIII. RISK AND VULNERABILITY ASSESSMENT IN JAPAN**

**Risk Assessment Methods Used In Japan aimed at:**

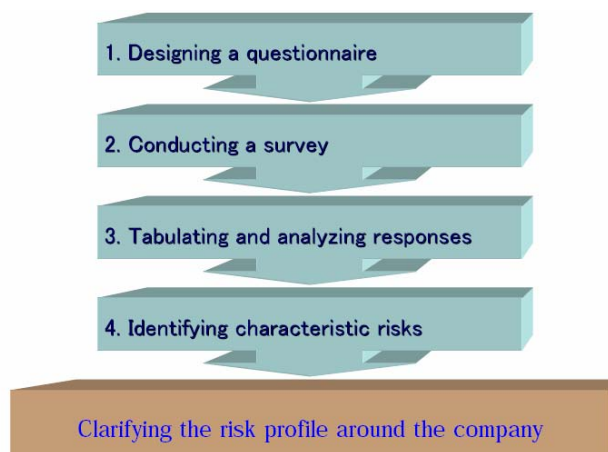
- Identifying, monitoring and evaluating earthquake risks
- Detecting vulnerabilities in physical structures
- Detecting and monitoring new and existing vulnerable groups in the population
- Identifying secondary effects of earthquakes, including business interruption costs
- Integrating different types of risk and vulnerability data

## Insurance Oriented Risk Assessment



21

## Process of Risk Mapping:



22

## **IX. CONCLUSION AND RECOMMENDATIONS**

- Impossible to draw a universal conclusion that fits all concepts and methodologies on assessment
- Different assessment methodologies have to be combined or used simultaneously to provide more comprehensive information
- A decision about whether to use qualitative and quantitative assessment tools depends both on the level of the approach, its focus and functions

23

## **Recommendations for Further Risk Assessment in Mongolia**

1. Set up expert team;
2. Identify key bodies involved and define their roles and responsibilities;
3. Review existing studies;
4. Develop method for collecting, sharing data and information;
5. Establish a process to review and update risk data;
6. Characterize and prioritize natural hazards and evaluate historical data;
7. Develop integrated hazard maps;
8. Conduct vulnerability and capacity assessments;
9. Develop risk analysis;
10. Assess interaction of hazards and vulnerabilities to determine the risks;
11. Develop papers and policy documents with recommendations and a strategic plan.

24

**THANK YOU !**