Review of Initiatives on Hazard, Vulnerability and Risk Assessment in Asia and Pacific

ISDR Asia Partnership

Framework for undertaking the review

- Analysis of need of the users
  - Kind of users
  - Kind of decisions the end users could take using the results of the risk assessment
  - Kind of information an end user need from a risk assessment in supporting decision making
- Reasons for usage (limited/extensive) of existing initiatives
  - Regular update
  - Capacity to undertake and apply the results of risk assessment
  - Availability of tools and guidelines on applications of risk assessment results
  - Involvement of stakeholders in design
- Gaps in scope of current initiatives on risk assessment
  - Geographical scope
  - Type of hazards covered
  - Methodology
  - Availability of Data Source (hazards, exposure on population and economic asset, vulnerability etc.)

Proposed structure of the review

- **Section 1: Background**
- **Section 2: Purpose**
- **Section 3: Inventory and review of the initiatives**
- **Section 4: Summary of findings from the initiatives**
- **Section 5: Scope of Improvement**

Section 3: Inventory

Sl. No	Name of Assessment	Implementing Organization	Brief description	Focus		Target audience	Outputs	Reference
				Hazard	Vulnerability			
Risk Assessment								
1	**Disaster Risk Index (DRI) (Global Risk And Vulnerability Index Trend per Year (GRAVITY)**	UNDP, 2004	• It enables the measurement and comparison of relative levels risk of death in natural disasters between countries. • It does not measure risk to physical infrastructure and to the economy but only one aspect of risk to human development, namely the risk of mortality.	Natural hazards: • Earthquake • Flood • Cyclone	Relative vulnerability of a given country to a given hazard was calculated by dividing the number of people killed by the number exposed.	•	• Published in the report: Reducing Disaster Risk: A Challenge • Online tool comprising of the Country Profile and DRI analysis tool	www.grid.unep.ch/activities/earlywarning/DRI/
2	**Natural Disaster Hotspots: A Global Risk Analysis**	The World Bank, Hazard Management Unit, Volume 1, 2005, Volume II, 2006	• Natural Disaster Hotspots presents a global view of major natural disaster risk hotspots - areas at relatively high risk of loss from one or more natural hazards. • Data on the identified hazards are combined with state-of-the-art data on the sub-national distribution of population and economic output and past disaster losses to identify areas at relatively high risk from one or more hazards. • Risk of mortality and economic losses are the assessed disaster outcomes.	Natural hazards: • Earthquake • Volcano • Landslide • Flood • Drought • Cyclone	High definition (sub-national) population distribution, economic output, and past disaster losses	• Development agencies • Policymakers	• Volume I: Natural disaster hotspot: A global risk analysis (2005) • Volume II: Natural disaster hotspot case study (2006)	www.ldeo.columbia.edu/chrr/research/hotspots/

From the inventory we could understand…..

1. Type of Initiatives
2. Types of Output
3. Range of Target Users
4. Possible usage
5. Types of hazards covered
6. Indicators for vulnerability
7. Methodology

1. Type of Initiatives

1. Initiatives on Risk Assessment
2. Initiatives on Vulnerability Assessment
3. Initiatives on Disaster Databases
4. Initiatives on assessing risk from climate change

Initiatives on Risk Assessment

- Initiatives are mostly at the Global level
  - Disaster Risk Index, 2004
  - Natural Disaster Hotspot, 2005, 2006
  - Global Assessment Report, 2009
  - GRIP
- Few initiatives at regional level (Asia Pacific level)
  - Risk Assessment and Mitigation Measures for Natural and Conflict-Related Hazards in Asia-Pacific
  - Preliminary Natural Hazard Risk Assessment in the Asia-Pacific
  - Natural Hazards and Vulnerability Atlases
- Comprehensive risk assessment absent at sub-regional level
  - Flood Risk Assessment of Lower Mekong Basin
  - Central Asian Regional Risk Assessment (focuses on the threats to water, energy and food security)

 Specific focus

Initiatives on Vulnerability Assessment

- **Both at global level**
  - **Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS) of FAO**
  - **Vulnerability Analysis and Mapping (VAM) of the WFP**

 Aims at assessing the vulnerability from the angle of food security

Initiatives on Disaster Databases

- Emergency Events Database (EM-DAT) of the CRED,
- Database for Disaster Information maintained by the ADRC,
- Online Southeast Asia Disaster Inventory of the ACDM
- Desinventar coordinated by the UNDP

→ Purpose is to provide information on disaster events

Initiatives on assessing risk from climate change

- Study undertaken by JICA-WB-ADB on Adaptation to Climate Change in Asian Coastal Cities

→ Assesses the risk faced by 4 mega city of Asia from impacts of climate change (increase in flooding)

- Tool developed by World Bank GFDRR and ISDR on Climate Resilient Cities

→ Provides tool on assessing city's human and built environment characteristics, potential impact of climate change, and natural or other hazards.

2. Types of Output

1. Study/Report
2. Online tool
3. Support systems to assist the countries/specific locations/stakeholders in undertaking risk assessments

Study/Report

1. Natural Disaster Hotspot: A global risk analysis, Volume 1, 2005
2. Natural Disaster Hotspot Case Study, Volume II, 2006
3. Global Assessment Report on DRR, 2009 (Biennial Report)
4. The Natural Disaster Profiles for Indian Ocean Countries, 2005
5. Risk Assessment and Mitigation Measures for Natural and Conflict-Related Hazards in Asia- Pacific, 2009
6. Preliminary Natural Hazard Risk Assessment in the Asia-Pacific region, 2007
7. Central Asia Regional Risk Assessment: Responding to Water, Energy and Food Insecurity, January 2009
8. Study on Adaptation to Climate Change in Asian Coastal Cities,2007-2008

Undertaken at a particular point of time

Regional initiatives but outputs are at National/Sub national/City level

Online tool

- **Global Risk Data Platform**
  - **Data presented here is the results of study made for the 2009 Global Assessment Report on DRR.**
  - **Allows the visualisation of data on natural hazards, exposure (both human and economical) and risk.**
  - **Static tool**

- **Natural hazards and vulnerability atlases of Asia and the Pacific**
  - **Used to generate risk maps based on hazards (current, historical, hazard model outputs, risk and vulnerability), observation and forecast (metar observations, sea level stations, TRMM Rainfall accumulation) and basemap layers (demography, infrastructure, boundaries, hydrology, imagery/elevation)**
  - **Real time**

Support systems

- **Global Risk Identification Program**
  - **Generation of evidence-based risk information and facilitates its applications to improve the quality of policies, regulations and investments at all levels**
  - **GRIP project activities fall into 5 Outcome Areas**
    - **Capacity development**
    - **Loss data enhancement**
    - **Risk information improvement**
    - **Demonstration countries**
    - **Monitoring and evaluation**

3. Range of Target Users

1. **National-level policy makers / national disaster management organisations/regional and international organizations and donors**
2. **Governments and partners at sub-national/local levels.**
3. **Specific users such as planners involved in contingency planning, and relief operations and international aid organizations**
4. **Internal purposes of the organization**

Risk Model of the UNOCHA undertaken annually since 2007 is intended to guide the work of staff within the framework of OCHA's annual workplan

VAM of WFP which develops maps identifying food insecurity and emerging vulnerability provides a framework for continually assessing the food security and vulnerability status of WFP beneficiaries.

4. Possible usage

Global Assessment Report

- Visualization of the **major concentrations of risk**.
- Identification of the **geographic distribution of disaster risk** across countries, trends over time and the major drivers of these patterns and trends.
- Enables **estimating average patterns and trends in disaster risk** but are not able to predict extreme events, given the data limitations and the unpredictability of individual hazard event.

Natural hazard and vulnerability atlas

- What hazards/disasters are likely to occur in a given region?
- How often might they occur and how intense are they likely to be?
- **Where the current hazard events are and what areas have they impacted?**
- **How severe is the current/approaching event?**
- **How many people might be affected?**
- **Are lives at risk right now? Will they be?**
- What is the potential impact on critical infrastructure in the region?
- Where should relief supplies and services be staged and when should they be moved?
- Is it appropriate to issue a warning or initiate an evacuation now?

5. Types of hazards covered

Sl. No.	Initiative	Hazards								
		Earthquake	Floods	Cyclone	Tsunami	Drought	Landslide	Wildfire	Volcano	Others
1	Disaster Risk Index	√	√	√	x	√	x	x	x	
2	Natural Disaster Hotspots: A Global Risk Analysis	√	√	√	x	√	√	x	√	
3	2009 Global Assessment Report on Disaster Risk Reduction	√	√	√	√	√	√	√		
4	Global Risk Identification Platform (GRIP)	√	√	√	√	√	√	√	√	
5	Risk Assessment and Mitigation Measures for Natural and Conflict-Related Hazards in Asia-Pacific	√	√	√	√	√	√	√	√	Extreme temperature, epidemic, insect infestation Conflict, Political unrest
6	Global Focus Model	√	√	√	√	√	√	√	√	Extreme temperature, epidemic, insect infestation Conflict, Political unrest
7	Natural Hazards and Vulnerability Atlases	√	√	√	√	x	x	√	√	
8	Natural Disaster Profiles for Indian Ocean Countries	√	√	√	x	√	√	x	√	
9	Mekong basin wide flood risk assessment	x	√	x	x	x	x	x	x	
10	Central Asian Regional Risk Assessment (CARRA)	x	x	x	x	√	x	x	x	Exceptional cold winters,
11	Preliminary Natural Hazard Risk Assessment in the Asia-Pacific region	√	√	√	√	x	√	√	√	

6. Indicators for vulnerability

1. **Wide range of indicators used**

2. **Typically**
   - **Population Distribution**
   - **Economic exposure**

3. **Specific initiatives include**
   - **Poverty**
   - **Displacement**
   - **Food security**
   - **Diseases**
   - **Transportation Infrastructures**

4. **Vulnerability due to quality of physical assets is not taken into account due to unavailability of data**

7. Methodology

1. **Most of the initiatives cover multi-hazard.**

2. **Typically number of fatalities is the typical metric used to classify disasters, however in specific initiatives such as in the Preliminary risk assessment on Asia and Pacific carried out by Australian Geoscience 'significantly impacted population' as the risk metric**

3. **Most of the initiative considers Hazard and too some extent Vulnerability, only the Global Focus Model of OCHA looks into capacity**