Applying risk information in preparing DRR strategies and actions – Contribution from Space-based technologies

Shirish Ravan
United Nations Office for Outer Space Affairs
Shirish.ravan@un.org
Swimming is strictly prohibited
SURVIVORS WILL BE PROSECUTED

Risk information is critical for formulating right strategy, policy and action

Tadoba Tiger Reserve, India
# Sendai Framework for Disaster Risk Reduction: 2015-2030

## 4 Priorities for Action

### Priority 1: Understanding disaster risk

Policies and practices for DRR should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment.

### Priority 2: Strengthening disaster risk governance to manage disaster risk

Disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk.

### Priority 3: Investing in disaster risk reduction for resilience

Public and private investment in DRR are essential to enhance the economic, social, health & cultural resilience of persons, communities, countries, their assets, as well as environment.

### Priority 4: Enhancing disaster preparedness for effective response, and to “Build Back Better” in recovery, rehabilitation and reconstruction

Strengthened disaster preparedness for response, recovery, rehabilitation and reconstruction are critical to build back better.
Sendai Framework for Disaster Risk Reduction: 2015-2030

7 GLOBAL TARGETS

Reduce

- Mortality/
global population
  2020-2030 Average << 2005-2015 Average

- Affected people/
global population
  2020-2030 Average << 2005-2015 Average

- Economic loss/
global GDP
  2030 Ratio << 2015 Ratio

- Damage to critical infrastructure & disruption of basic services
  2030 Values << 2015 Values

Increase

- Countries with national & local DRR strategies
  2020 Value >> 2015 Value

- International cooperation
to developing countries
  2030 Value >> 2015 Value

- Availability and access to multi-hazard early warning systems & disaster risk information and assessments
  2030 Values >> 2015 Values

Reference: ISDR
**Target E:** Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020

**E-1:** Number of countries that adopt and implement national DRR strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030

**E-2:** Percentage of local governments that adopt and implement local DRR strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030

Nepal Disaster Management Strategy refers to Remote Sensing, GIS and Open source technology
Link between Priority 1 and Target E

Understanding disaster risk is required for a risk informed DRR strategy and sustainable development planning

- UNDRR
Earth Observation in DRR Strategies

Advanced Earth Observation systems provide ‘SPATIAL RISK INFORMATION’

Enhanced understanding of the ‘RISKS’

Strategies based on ‘RISK INFORMATION’ lead to factual DRR STRATEGIES

Earth observation
50 years of accumulated knowledge of earth systems, including atmosphere, land, oceans and ice coverage
Increasing risk of GLOFs is a main concern in the Hindu Kush Himalayas

Approximately 200 glacial lakes have been identified as potentially critical

Such information is critical for Disaster Risk Strategy and related policies and actions.

CORONA, first space reconnaissance satellite collected over 800,000 images in 1960s, which were made public in 1995

Imja Tsho lake and downstream village, Nepal, October 2010
Earth observation

- Spatially extensive mapping
- Localised event detection
- Near real time

Global Navigation Satellite Systems (GNSS)

- Beyond ‘human eye’ capability
- Access difficult or dangerous sites
- Geo-referenced and calibrated

Geo-location
Geo-referencing
Time stamping

Source: ESA

Integrating Earth observation and GNSS allows development of tools to map precise risk information
Space provides evidence based risk information

Predicts and computes risks invisible to human eyes

GNSS based surveys and InSAR analysis gives reliable estimates of the subsidence in an urban environment

Jakarta sinking fast: Experts (The Jakarta Post) North Jakarta alone could be 90 percent underwater by 2050

2011 floods in Bangkok is related to land subsidence (Over 800 deaths, USD 46.5 billion economic loss)
Integrated EO and GNSS application

Monitoring air pollution with reference to an individual user

Air pollution is responsible for more than 450,000 premature deaths in Europe each year.

Reference: UNOOSA Publication
Integrated Drought Risk Management (IDRM) Framework

Monitoring & Forecasting / Early warning
- Understanding drought risk for planning;
- Indices/indicators linked to impacts and action triggers;
- Feeds into the development/delivery of information and DSS

Vulnerability & impact assessment
- Identifies who and what is at risks and why?
- Involves monitoring/archiving of impacts to improve drought characterization
- Coping capacity of the communities

Mitigation & response planning and contingency measures
- Pre-drought program and actions to reduce risks (short and long-term);
- Operational drought contingency plans during drought disasters;
- Safety net and social program, research and extension

Three pillars of drought risks management
- Meteorological, Hydrological, and Agricultural Droughts
- Drought bulletin
- Drought vulnerability
- Impact evaluation
- Risk transfer using index insurance
- Drought declaration
- Support national policies
Space technology to strengthen climate resilience policies

- Climate change is posing increased flood risks
- Climate adaptation and resilience (A&R) is a new challenge

**Policy**
Introducing flood resilient seeds to cope with climate variability using historical flood frequency, depth and duration with biophysical information namely Soil type, Soil organic matter and pH, land use and drainage condition to help the disaster affected farmers with the climate resilient seeds;

- Bihar (India) a flood-prone region, the assessment estimated approx. 5194 ton (0.05 t/ha) for a flood affected Kharif-paddy area of 103,891 ha;

- Thus, risk information contributes to climate resilience policies.
DRR strategy (and resulting policy/action) that is based on risk information prevents generating new risk
A policy perspective – Disaster Risk Reduction

DRR Strategy
Reference to Earth observation, GNSS and geospatial technologies in DRR strategy, disaster management act, standing order, plans...

Geospatial policies or National Spatial Data Infrastructure
Ensure systematic data generation, standardization, data access, sharing, capacity to use and so on

Capacity building strategy
Trained manpower with DM agencies and stakeholders
Concluding messages

• **Understanding disaster risk** is a non-negotiable requirement for DRR strategy and risk informed development.

• **DRR strategy that is based on risk information** translates into right policy and action.

• **Space-based technologies**, mainly Earth observation and navigation, play an important role in providing such risk information.

• **DRR strategy that incorporates use of space-based information** would also drive related policy instruments - geospatial policy and capacity building strategy.

• **International collaboration and partnerships** for the collection, sharing, and analysis of space-based data among the providers and users is critical.

• **UN-SPIDER** offers a platform to provide comprehensive technical advisory support.
THANK YOU

shirish.ravan@un.org
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<th>Wednesday</th>
<th>Thursday</th>
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<tr>
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<td><strong>11 September 2019</strong></td>
<td><strong>12 September 2019</strong></td>
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<tr>
<td><strong>Morning</strong></td>
<td>08:00-08:30 Registration</td>
<td>09:00-10:30 Session 3 (continue)</td>
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<td>08:30-08:55 Opening Ceremony</td>
<td>Advances in Earth observation and open source data to support DRR</td>
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<td>08:55-10:30 Felicitation and Group Photo</td>
<td>09:00-10:30 Side Event</td>
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<td>10:30-11:00 Keynote Speeches</td>
<td>Asia Pacific Disaster Report 2019 - Special session and launch of the report</td>
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<td>11:00-12:30 Session 1</td>
<td>11:00-12:30 Breakout Sessions</td>
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<td>Policy perspective - utilizing space-based technologies for successful DRR</td>
<td>1. Contributions of space-based information for Sendai Framework reporting</td>
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<td>2. Opportunities for institutional strengthening and capacity building from the policy perspective</td>
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<td>3. Guidelines for utilization of Earth observation during emergency response</td>
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<td>Lunch</td>
<td>12:30-14:00 Fusion Court Cafe, 1st Floor</td>
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<td>Afternoon</td>
<td>14:00-15:30 Session 2</td>
<td>14:00-15:30 Session 4</td>
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<td>Using space-based technologies as a supporting instrument to achieve targets of the Sendai Framework</td>
<td>Networking and engagement with the UN-SPIDER network</td>
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<td>16:00-17:40 Session 3</td>
<td>16:00-17:00 Concluding Session and Breakout Session</td>
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<td>Advances in Earth observation and open source data to support DRR</td>
<td>(Chairs/Co-chairs of each plenary session will present the conclusions)</td>
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<td>17:00-17:30 Closing Session</td>
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<td><strong>Evening</strong></td>
<td>18:30 Icebreaker by the Ministry of Emergency Management, P.R.C</td>
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