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

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

Sendai Framework for Disaster Risk Reduction: 2015-2030

Reference: ISDR

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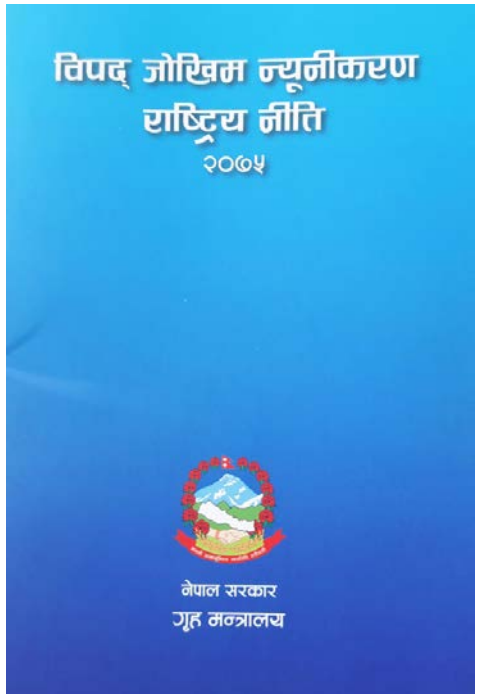
Reference: ISDR

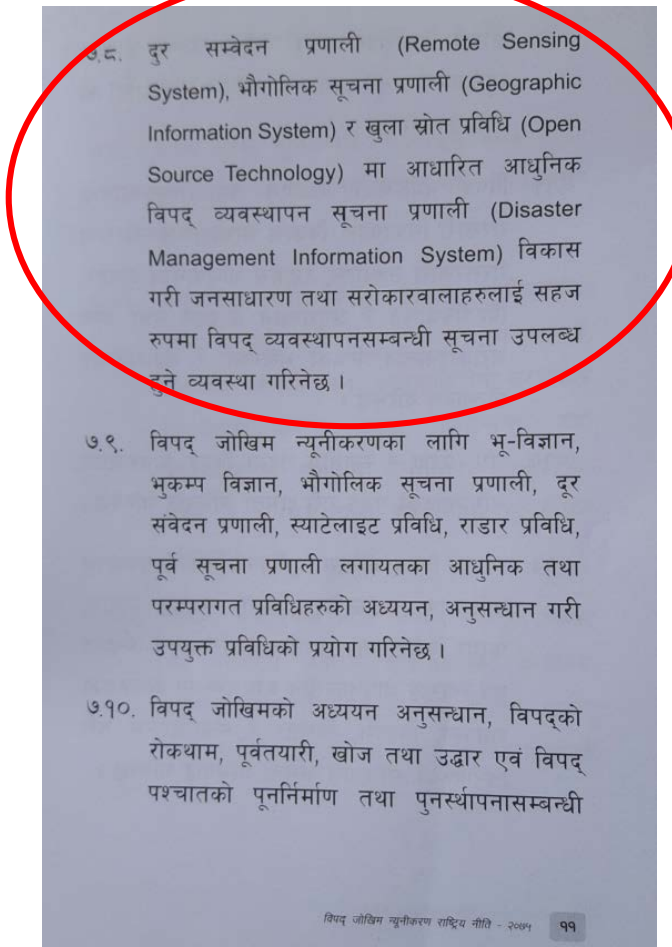
Target E: Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020

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



७.८. दुर सम्वेदन प्रणाली (Remote Sensing System), भौगोलिक सूचना प्रणाली (Geographic Information System) र खुला स्रोत प्रविधि (Open Source Technology) मा आधारित आधुनिक विपद् व्यवस्थापन सूचना प्रणाली (Disaster Management Information System) विकास गरी जनसाधारण तथा सरोकारवालाहरुलाई सहज रुपमा विपद् व्यवस्थापनसम्बन्धी सूचना उपलब्ध हुने व्यवस्था गरिनेछ ।

७.९. विपद् जोखिम न्यूनीकरणका लागि भू-विज्ञान, भुकम्प विज्ञान, भौगोलिक सूचना प्रणाली, दूर संवेदन प्रणाली, स्याटेलाइट प्रविधि, राडार प्रविधि, पूर्व सूचना प्रणाली लगायतका आधुनिक तथा परम्परागत प्रविधिहरुको अध्ययन, अनुसन्धान गरी उपयुक्त प्रविधिको प्रयोग गरिनेछ ।

७.१०. विपद् जोखिमको अध्ययन अनुसन्धान, विपद्को रोकथाम, पूर्वतयारी, खोज तथा उद्धार एवं विपद् पश्चातको पूनर्निर्माण तथा पुनर्स्थापनासम्बन्धी

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

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Glacial Lakes and Glacial Lake Outburst Floods in Nepal - ICIMOD

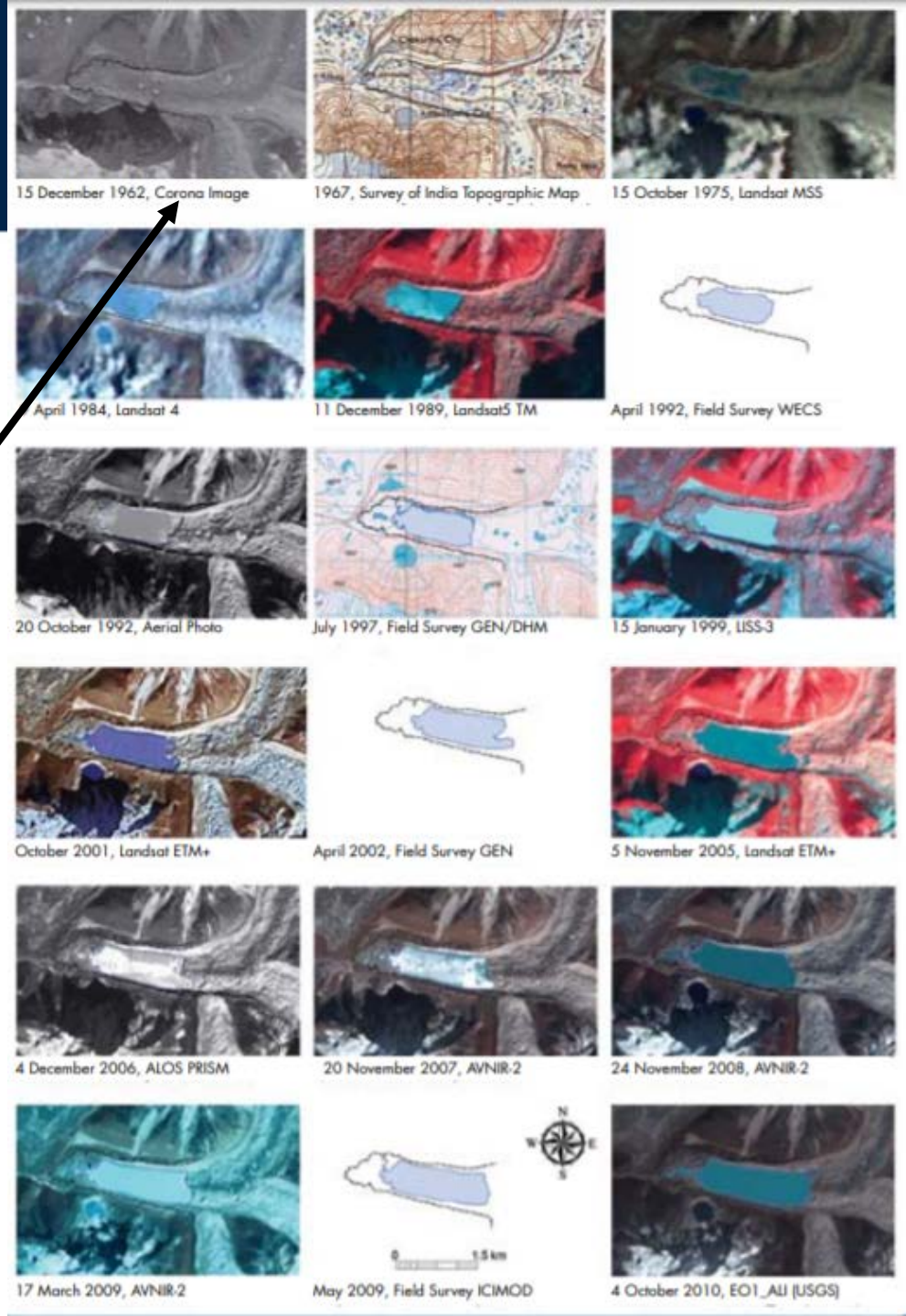
Increasing risk of GLOFs is
a main concern in the Hindu Kush Himalayas

Approximately 200 glacial lakes have
been identified as potentially critical

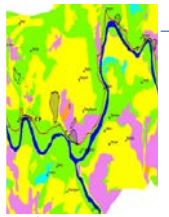
Such information is critical for Disaster Risk Strategy and related policies and actions.

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

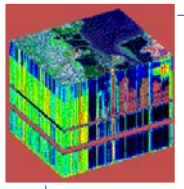
Imja Tsho lake and downstream village, Nepal, October 2010



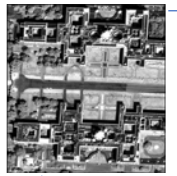
Earth observation



Spatially extensive mapping

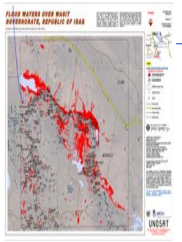


Beyond ‘human eye’ capability

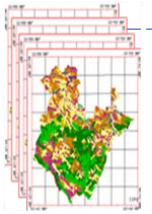


Localised event detection

Access difficult or dangerous sites

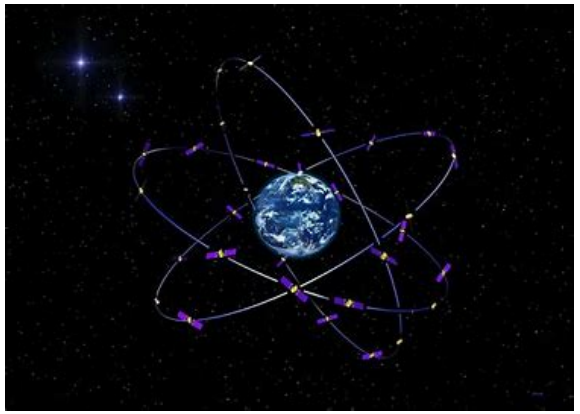


Near real time



Geo-referenced and calibrated

Global Navigation Satellite Systems (GNSS)



Source: ESA

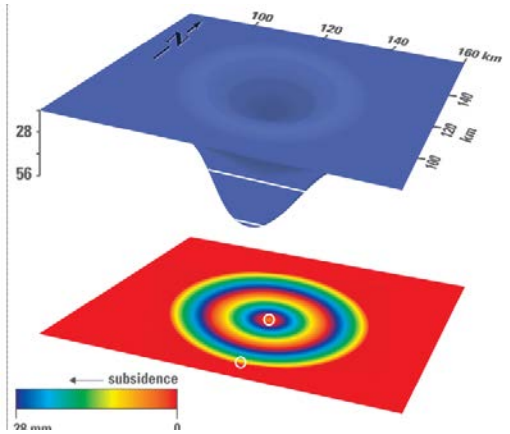
Geo-location
Geo-referencing
Time stamping

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



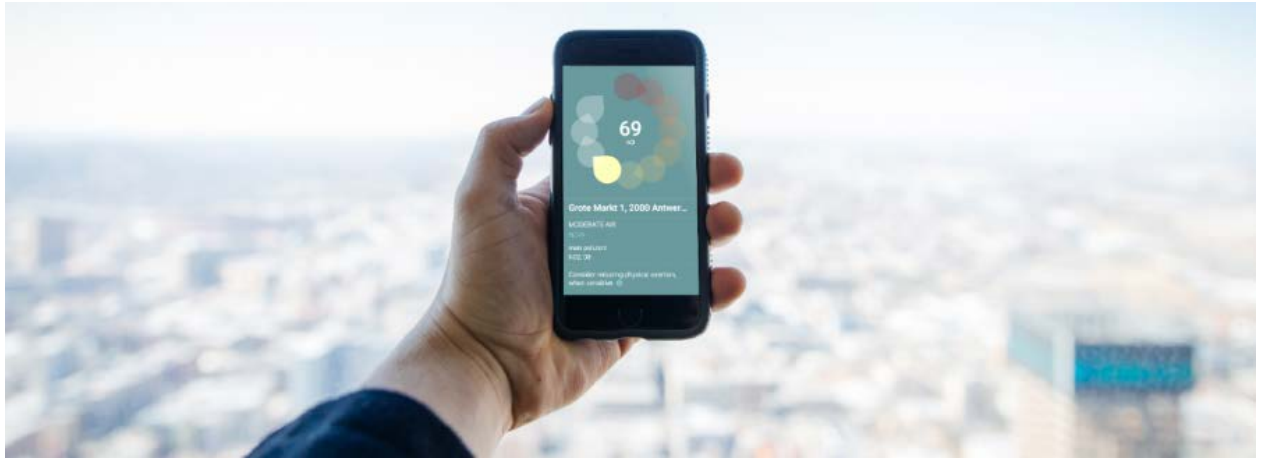
2011 floods in Bangkok is related to land subsidence
(Over 800 deaths, USD 46.5 billion economic loss)

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

Integrated EO and GNSS application

aircheckr

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
European Global Navigation Satellite System and Copernicus: Supporting the Sustainable Development Goals - BUILDING BLOCKS TOWARDS THE 2030 AGENDA

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Integrated Drought Risk Management (IDRM) Framework

International Water Management Institute

UN-SPIDER Regional Support Office

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

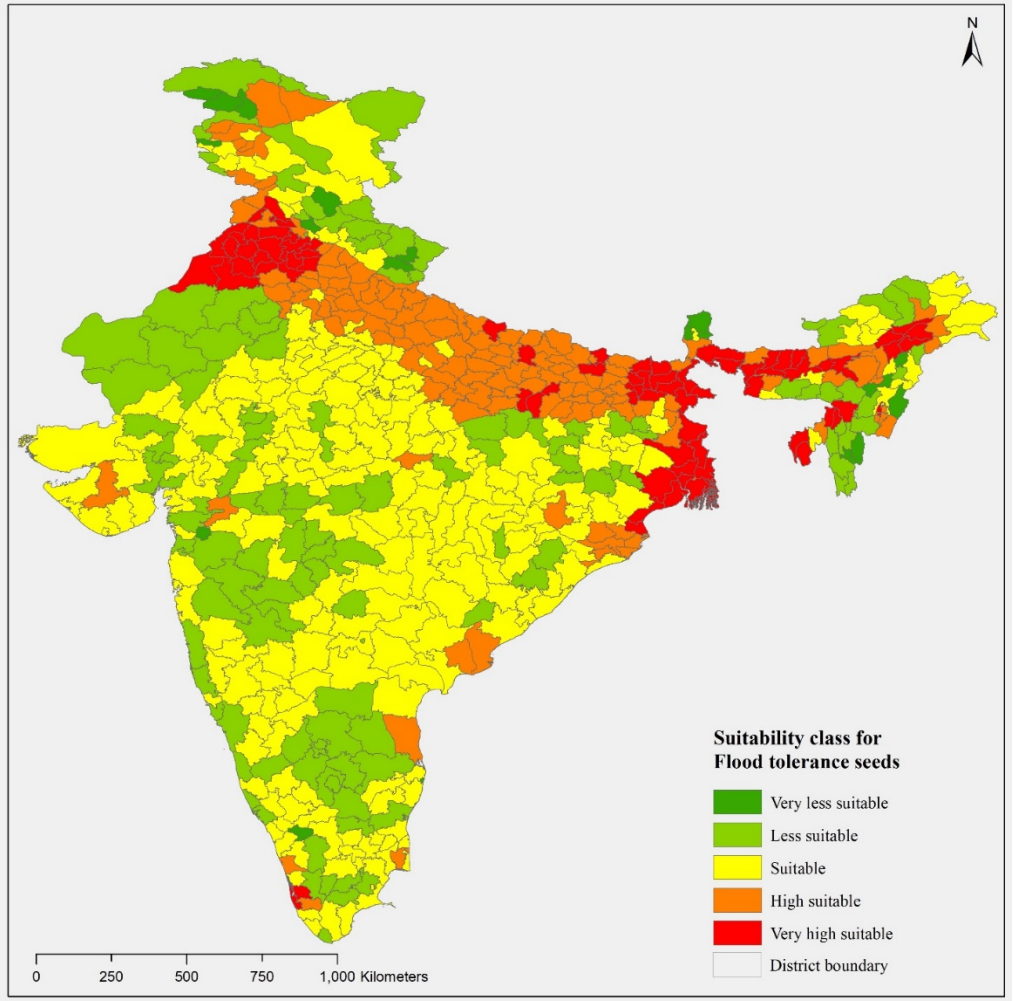
Space technology to strengthen climate resilience policies

- 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.



IWMI International Water Management Institute
CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security CCAFS
CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

DRR strategy (and resulting policy/action) that is based on risk information prevents <u>generating new risk</u>

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

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Conference overview

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