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United Nations Platform for Space-based Information for Disaster Management and Emergency Response

Georeferencing and Satellite Image Support: Lessons learned, Challenges and Opportunities

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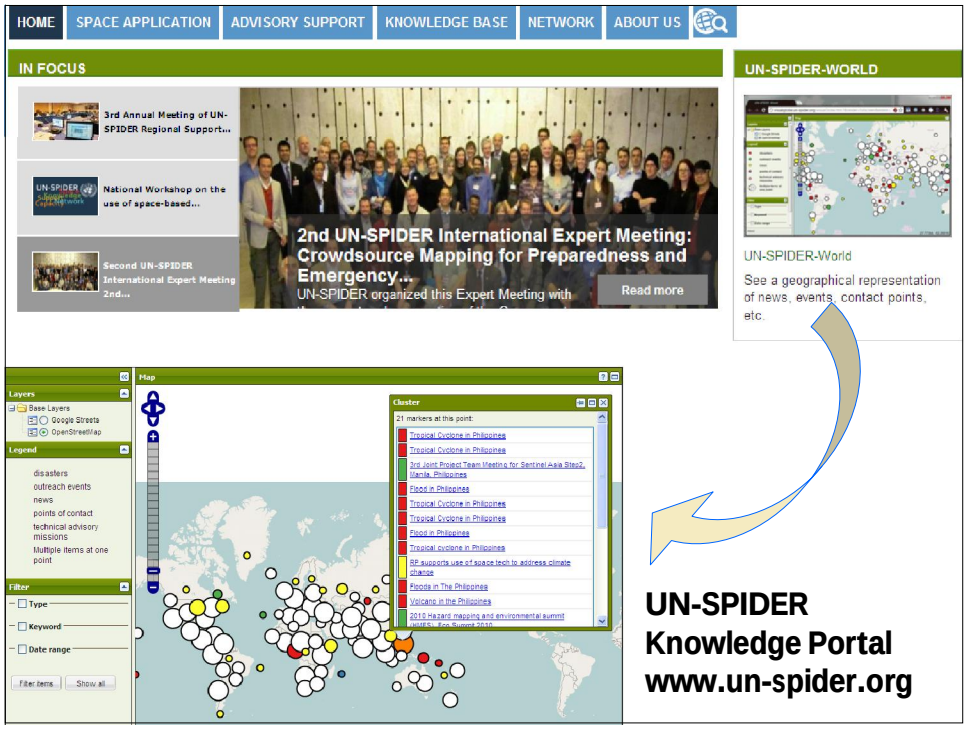
United Nations Office for Outer Space Affairs (UNOOSA)



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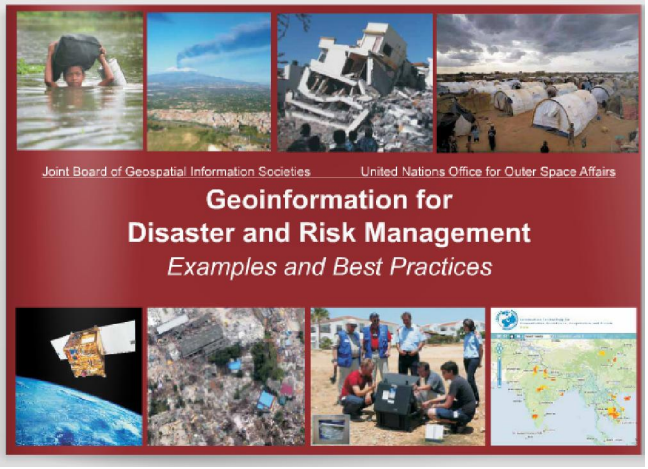
JBGIS Joint Board of Geospatial Information Societies



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N E X T

The Value of Geo-Information for Disaster and Risk Management (VALID)

Joint JBGIS/UNOOSA Publication Project

Assess what is it worth?

Goals:

–Benefit evaluation

–Awareness in the political and programmatic environment

–Highlighting priorities in research and development.

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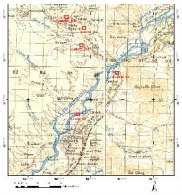
Up-to-date thematic and baseline spatial data is a basic requirement

- **Baseline data**
- **Thematic data on terrain and natural resources**
- **Disaster specific data**
- **Utility and infrastructure data**
- **Satellite images (Pre and Post disaster event)**

Most of the georeferenced information is derived from the satellite images

Baseline Data- Geographic Reference



Data	Description	Relevance to Disaster management
Administrative units	National, province/state, district boundaries to the locations of towns and villages	Data on administrative units and the village locations in GIS format is crucial in all phases of disaster management. This remains a base layer to which other data is linked such as demography, socio-economic data and amenities/services etc.
Demography	All details about population and its distribution based on age, sex, education etc.	Demographic data provides magnitude of population at stake. Source of this information is often statistical services of the country.
Socio-economic details	Education, occupation, income, assets and comprehensive information based on household survey	Socio-economic information provides important basis to understand the social and economic status of the population in the area at risk.
Amenities	Rescue services including army, fire, police etc., medical services, schools, communication, gas stations etc.	Information on about amenities helps understanding the resources available in the area under risk or area affected which can be mobilized during disaster.

Utility and Infrastructure data – Risk and vulnerability assessment

Data on utility and infrastructure is critical risk reduction and response activities

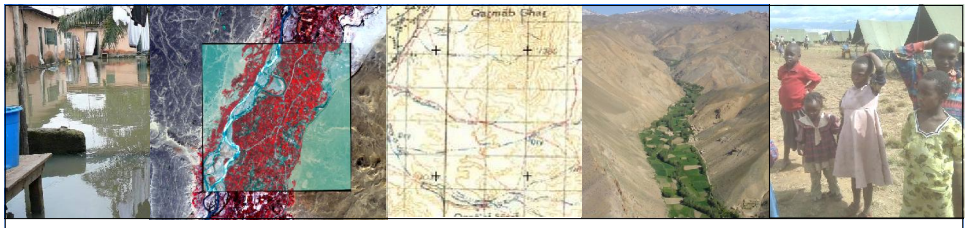
Data	Details	Relevance to Disaster management
Transport network	Entire transport network including roads and other modes of transport that reaches villages	Updated transport network provides critical information during response stage about access to disaster affected area
Electricity network		Electricity is the one of the essential utility in order to continue rescue efforts. Data on electricity network is important input in disaster management plans at local level.
Cadastral details	Maps at cadastral level showing linked with land records	Cadastral mapping using high resolution satellite data is common practice. Such data provides critical input to the humanitarian agencies and the Government for determining loss of productive land or land owned by displaced families and determine compensation
Region specific utility network	Gas pipelines, oil pipelines, canal network, bridges etc.	Data on utility and infrastructure helps identify vulnerability associated with these critical facilities and services; and in planning the responses during disaster situation.

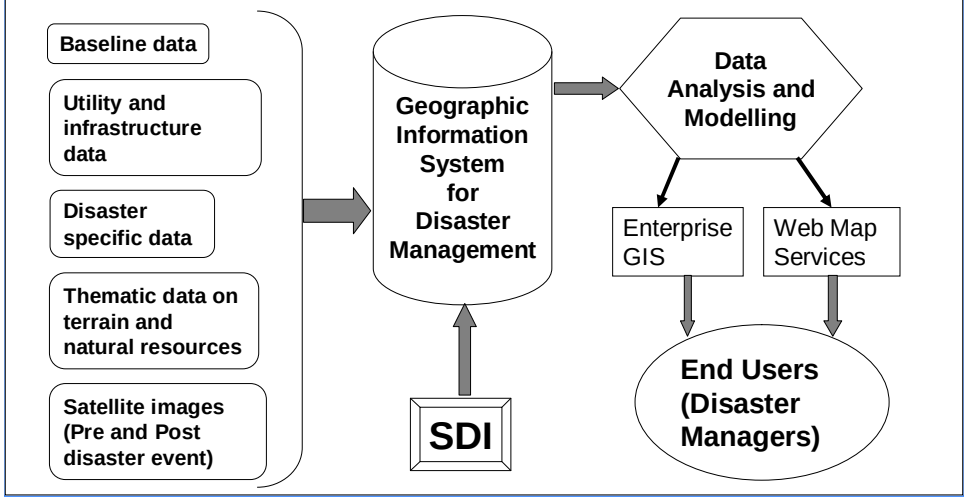
Disaster- risk specific data

- Location and extent of hazards
  - Landslides
  - Flood prone areas
  - Erosion prone areas
  - Coastal hazards
- Rescue facilities
- Disaster response related infrastructure and amenities

Thematic data on terrain and natural resources

Data	Details	Relevance to Disaster management
Elevation and slope	SRTM global elevation data at 90 m resolution are available which are generally useful for risk mapping. Medium resolution DEM at 30 meters resolution are available from ASTER. High resolution DEMs can be obtained from aerial data or simply derived based on the contour maps. Slopes can be derived using elevation data.	Elevation is most essential information for hazard zonation and utility of elevation data depends on the its resolution or scale at which it is derived. For mitigation purpose, high resolution DEM can be obtained from other sources.
Landuse	Various levels of landuse maps are available based on the scale of remote sensing images used for landuse mapping. Landuse depicts details about agriculture, forests, wastelands, barren lands, settlements, water bodies	Landuse maps help in assessing resources at stake in case disaster strikes. It also provides inputs for scientific modeling for risk assessment and to identify risk-management measures.
Forestry types	Forest types and additional attributes such as data on composition of forests, biodiversity, biomass etc.	Forest is one of the important environmental parameter, specially in controlling flood, coastal process etc. Detailed forest type maps can provide valuable inputs in risk assessment.
Geology	Rocks, minerals and geological features faults, lineaments etc.	These maps provides inputs assess a variety of hazards such as landslides, earthquakes, and floods to some extent. Such maps are used in the case of preparedness planning. It also provides inputs in mitigation planning during planning of critical facilities.
Soil	Soil type, texture, depth etc.	Soil maps can provide important inputs in the case of landslides and other types of mass movements.
River and drainage network	Water bodies, rivers, drainage network	These maps are used to elaborate hazard maps related to floods, as well as during response and post disaster stages.
Geomorphology	Landforms	Information on landforms is





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Uses of thematic maps

- Risk and hazard profiles
- Sustainable Land use development
- Water resources development
- Waste land development
- Urban planning
- Watershed management
- Coastal zone management planning
- Environment and biodiversity
- …

Mainstreaming the Disaster Risk Reduction

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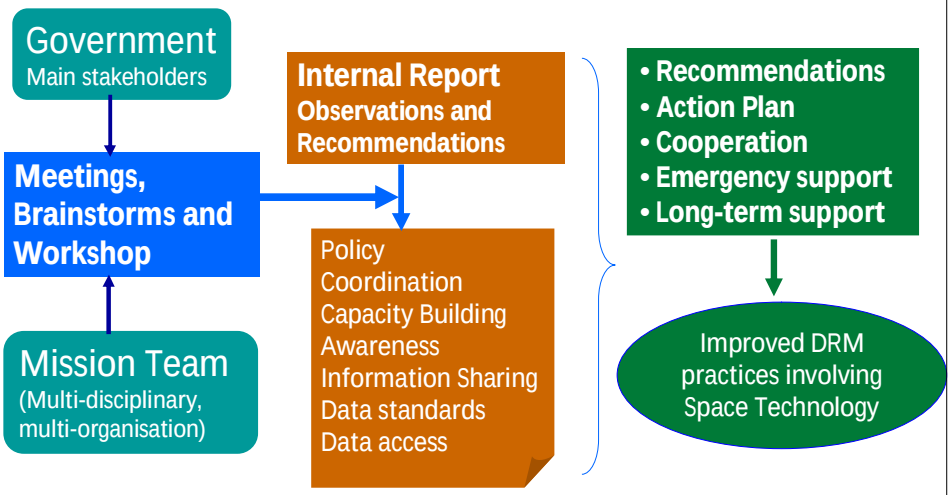
UN-SPIDER Technical Advisory Missions



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UN-SPIDER Technical Advisory Missions

Sri Lanka

Philippines

Maldives

Sudan

India

Fiji

Bangladesh

UN-SPIDER Technical Advisory Mission, Sri Lanka

17 – 21 October 2011

Survey: Spatial Data for Disaster Management and Country Profile (Prof. Ranjith Premalal De Silva)

1. *Ministry of Disaster Management (MDM)*
2. *Ministry of Technology and Research*
3. *Ministry of ICT and Telecommunication (ICTA)*
4. *National Building Research Organisation (NBRO)*
5. *International Water Management Institute (IWMI)*
6. *UN Country Team Information Management Group (UNCT IM):*
7. *Department of Meteorology*
8. *Coast Conservation Department*
9. *Telecommunication Regulatory Commission*
10. *Department of Survey and Mapping*
11. *Ministry of Public Administration and Home Affairs*

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Sri Lanka - Technical Advisory Missions

Technical workshop on the "Use of space technology for Disaster Management"

Impressions of the workshop: Minister of Disaster Management and representatives of UNDP, DMC and UN-SPIDER at the inaugural presentation; Participants of the workshop

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Challenges

Current state of Georeferenced Information