Update from Sri Lanka on the Current efforts to use Space-Based Information

Major General Sudantha Ranasingha (Retd)
Director General
Disaster Management Centre
Colombo – Sri Lanka

25th November 2020

Use of Geospatial Digital Data

Disasters are spatial as they strike at a specific location and influence a particular area. Hence, location intelligence plays a critical role in disaster management. Geographic Information System (GIS) coupled with Remote Sensing (RS) and Global Positioning System (GPS) technologies provide a basic framework that helps in all the stages of disaster management starting from preparedness, to response and recovery.
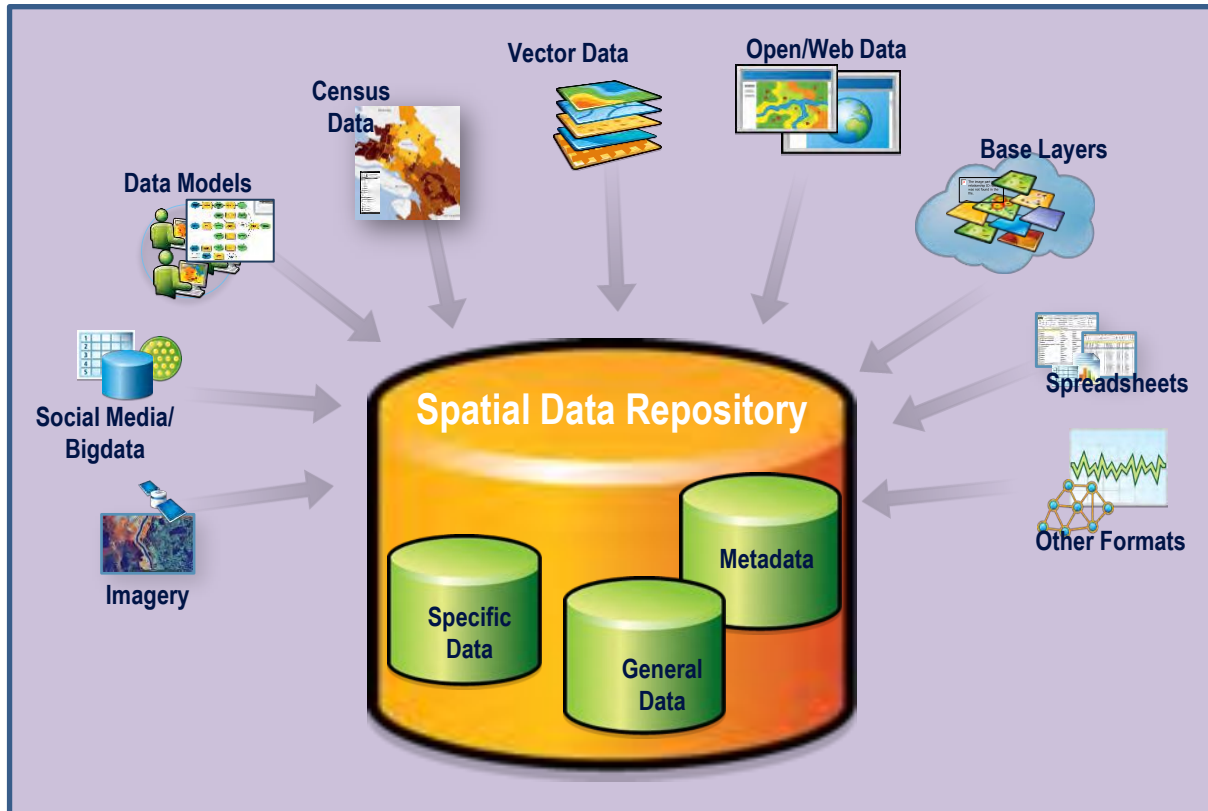
Objective

- To use of space technologies for disaster risk reduction and management as well as to achieve sustainable development in Sri Lanka

Application of Space Based Technologies in Disaster Management in Sri Lanka

– Weather forecasting

– Flood forecasting and mapping

– Landslide mapping

– Drought assessment

– Monitoring Human/ Elephant conflict

– Costal zone monitoring for coastal hazard prevention

– Forest fire management

Use of Remotely Sensed (RS) Data

Used Satellite Imageries

Sentinel Asia Emergency Observation

- Resourcesat-2 AWiFS data
- Resourcesat-2 AWiFS data
- ALOS-2-PALSAR-2/SAR
- THEOS PAN/MS
- Resourcesat-2 AWiFS data
- CARTOSAT-2 PAN
- Resourcesat-2 AWiFS data
- Resourcesat-2 AWiFS data
- ALOS-2-PALSAR-2/SAR
- ALOS-2-PALSAR-2/SAR
- FORMOSAT-5/ MSS 4 Bands + PAN
- FORMOSAT-5/ MSS 4 Bands + PAN
- Resourcesat-2 AWiFS
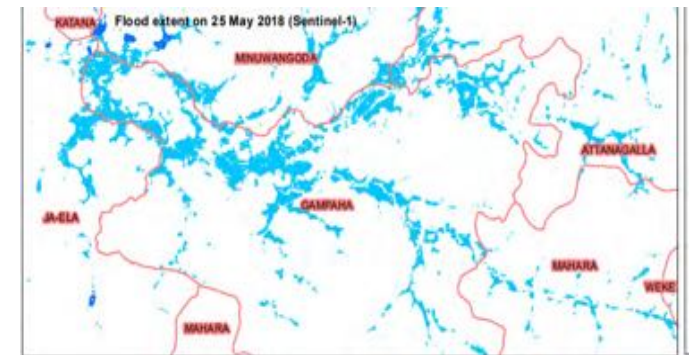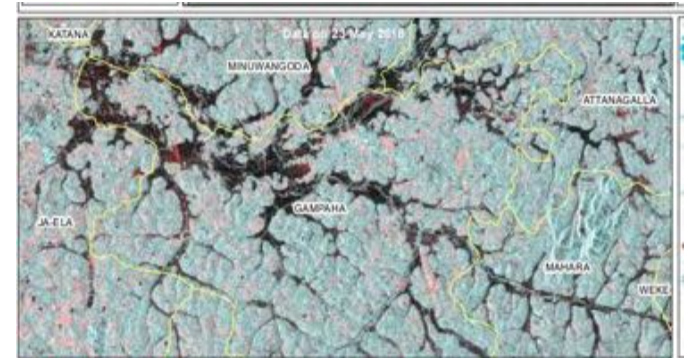
For,

- **Risk assessment & damage Assessment**
- **Share the produced results with relevant authorities**
- **Will be used to develop proper early warning system**

Creating Multihazard Map
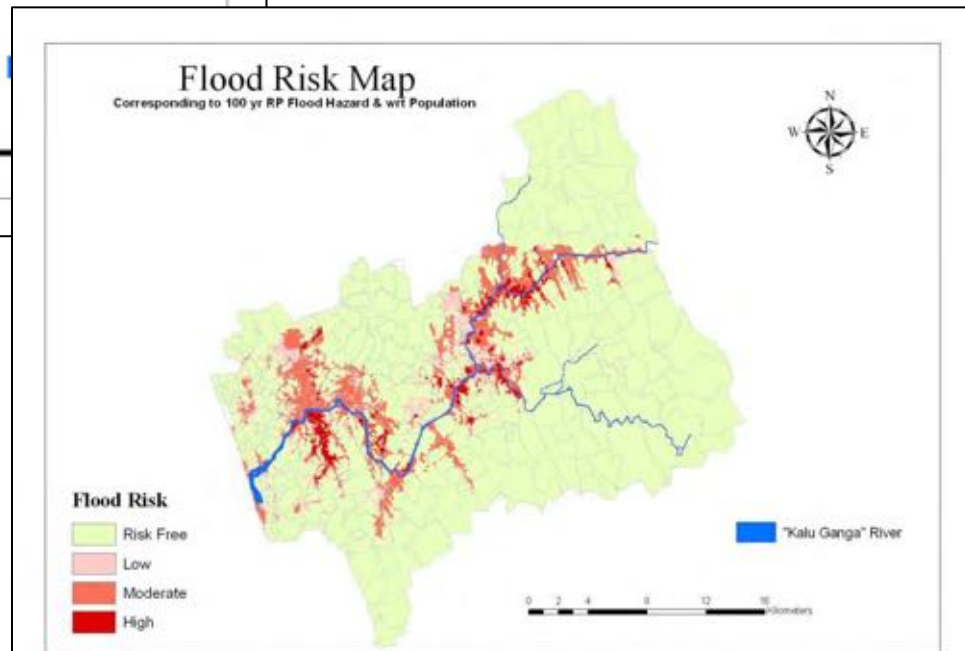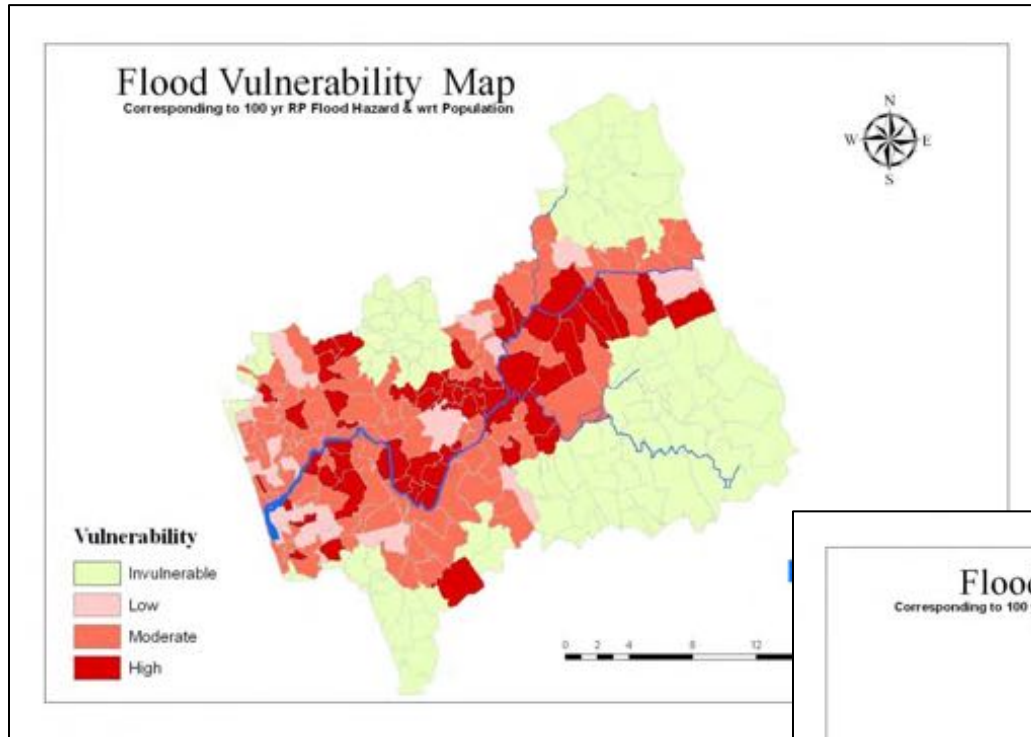
Results……

TIN Model of the Study area

LIDAR DATA

Contour Data

Drought Monitoring- 16 days Intervals

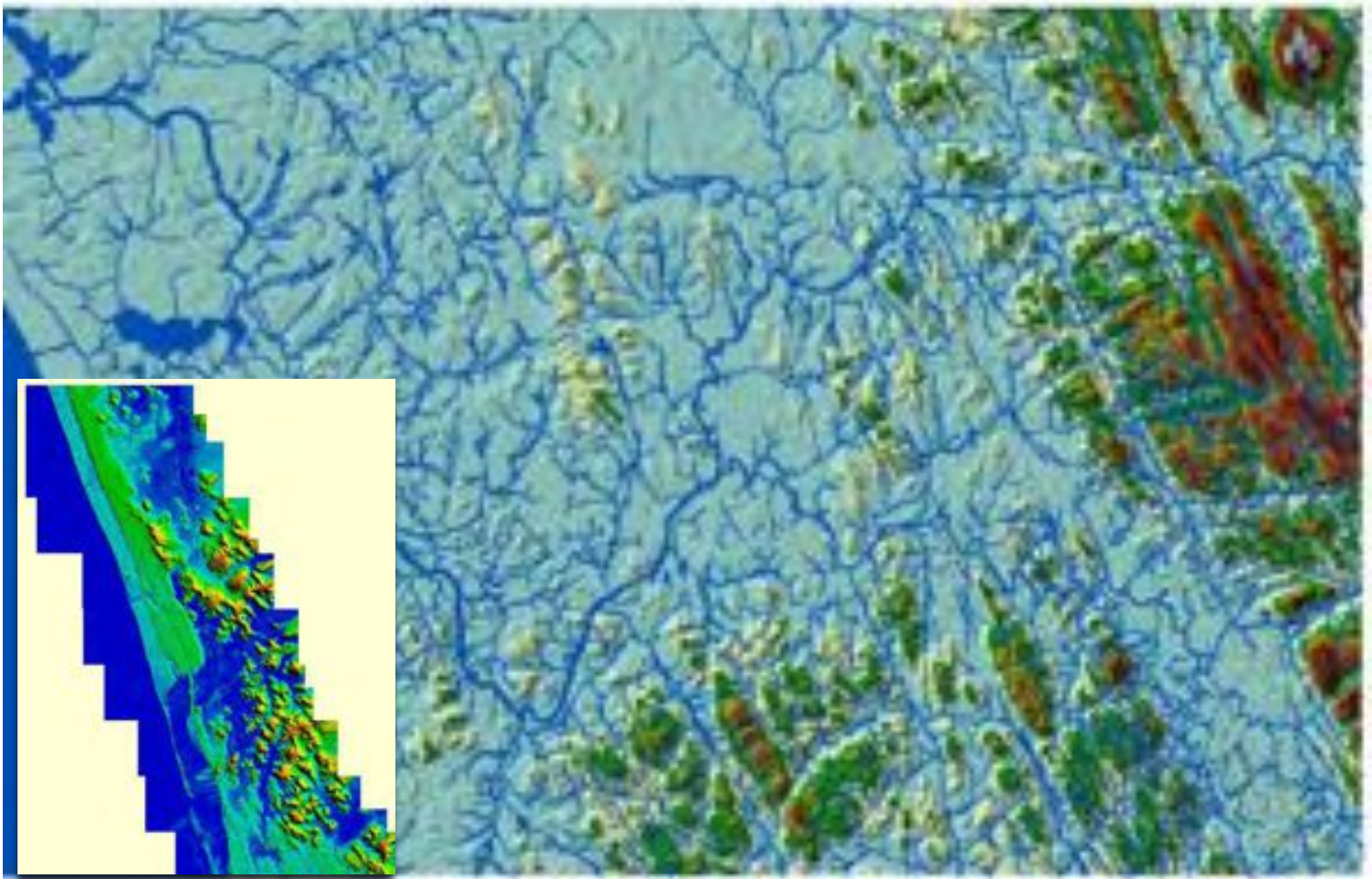- Under the UNSPIDER knowledge dissemination initiative, a recommended practice was introduced for drought monitoring using the Vegetation Condition Index (VCI).

- Currently Disaster Management Center conducts 16 days drought monitoring project utilizing MODIS Satellite imagery to analyze the impact of meteorological drought on vegetation.

- 20 years of Enhance Vegetation Index (EVI) data to calculate EVI anomaly in a 16 days interval (One layer stack for each date of year).

- Since, monitoring groundwater in terms of its location, quantity, and movement from one place to another is an important aspect of sustainable management of groundwater resources.

- **As an approach in the future we hope to integrate multiple drought indices: precipitation and soil moisture based anomalies to analyze meteorological drought, Agricultural drought and hydrological droughts in critical regions of Sri Lanka.**

Drought Monitoring in 16 days intervals
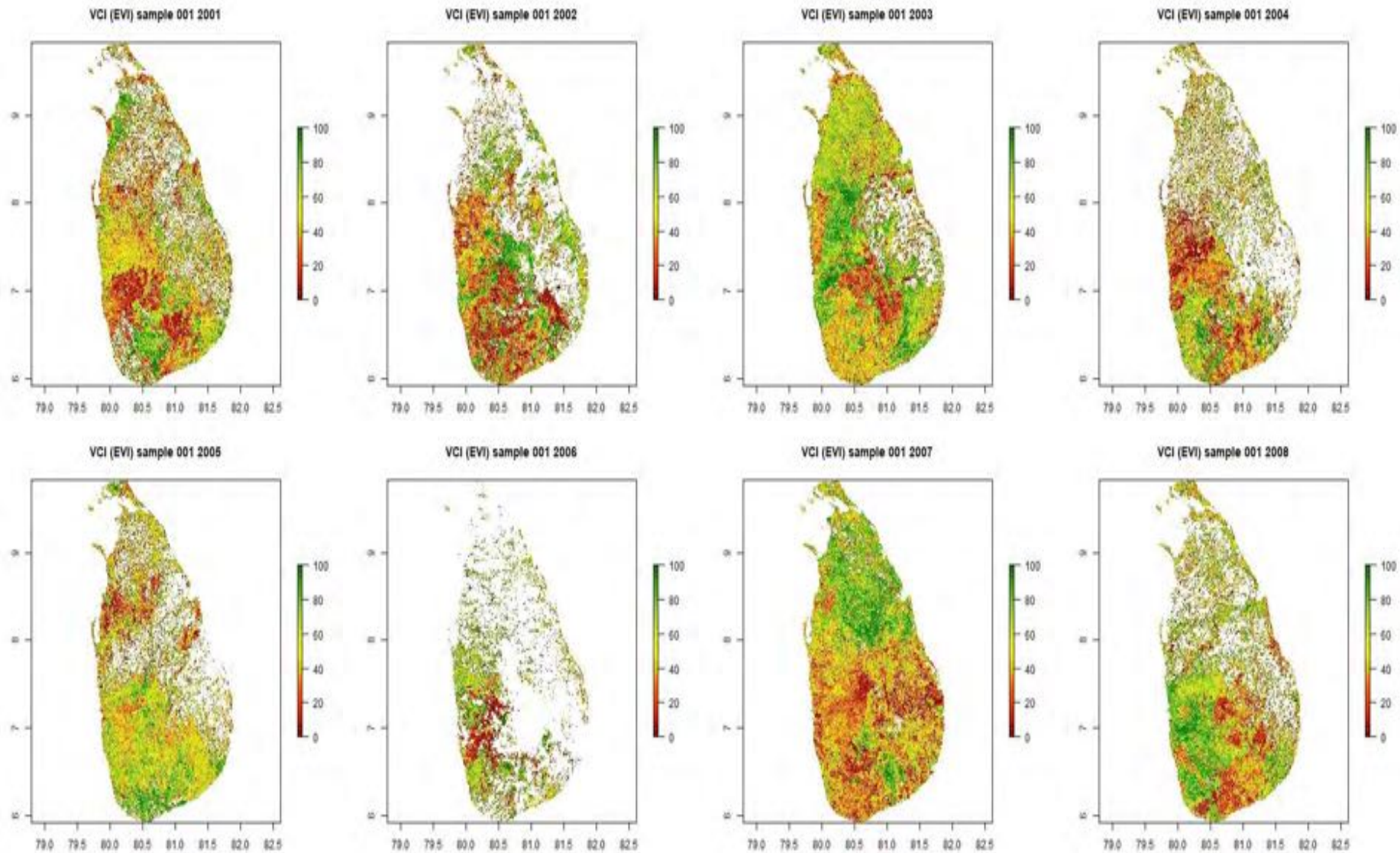
Forest Fire Incident Data

- MODIS Thermal Anomalies/Fire products are primarily derived from MODIS 4- and 11-micrometer radiances.

- The product includes fire occurrence (day/night), fire location, the logical criteria used for the fire selection, detection confidence, Fire Radiative Power and numerous other layers describing fire pixel attributes.
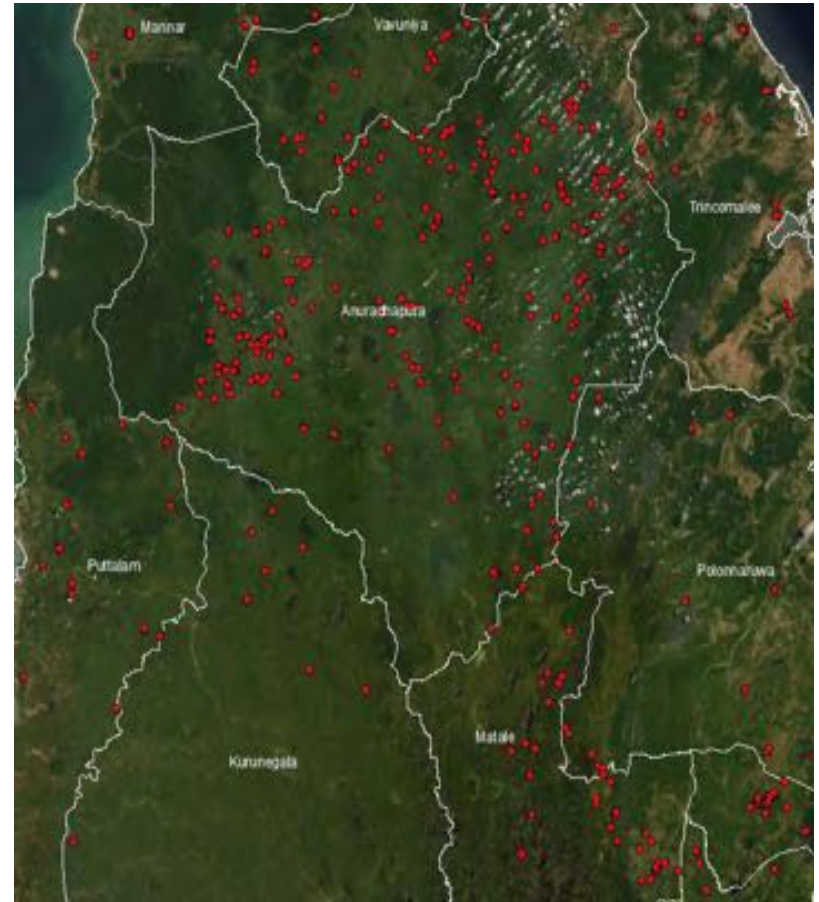
RISKINFO

is a platform for the management and publication of geospatial data.

With RiskInfo, non-specialized users can share disaster data and create interactive maps about hazard scenarios.

RISKINFO IS MADE FOR

The Public
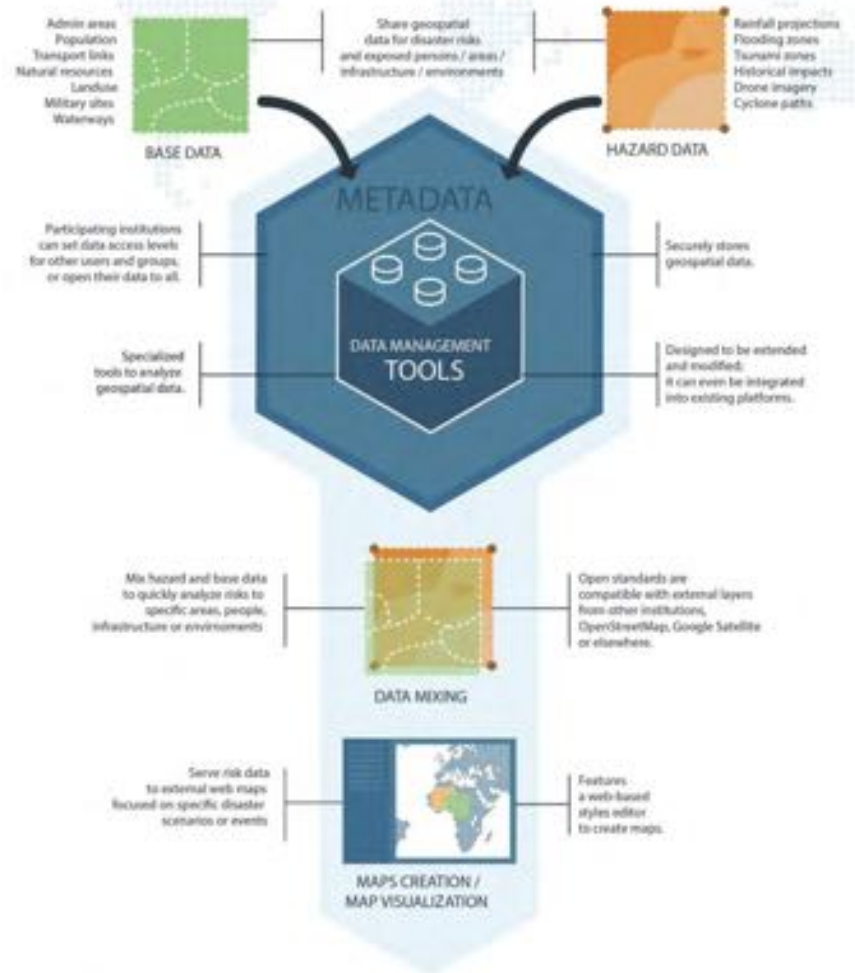to see hazards and understand their risks

Specialists
to create custom maps and analyze disaster risks in detail

Institutions
to manage and share their data efficiently, at the level of access they prefer

powered by GeoNode

MANAGEMENT AND PUBLICATION OF GEOSPATIAL DATA

BASE DATA
Admin areas
Population
Transport links
Natural resources
Landuse
Military sites
Waterways

Share geospatial data for disaster risks and exposed persons / areas / infrastructure / environments

HAZARD DATA
Rainfall projections
Flooding zones
Tsunami zones
Historical impacts
Drone imagery
Cyclone paths

METADATA

Participating institutions can set data access levels for other users and groups, or open their data to all.

Securely stores geospatial data.

DATA MANAGEMENT TOOLS

Specialized tools to analyze geospatial data.

Designed to be extended and modified; it can even be integrated into existing platforms.

DATA MIXING

Mix hazard and base data to quickly analyze risks to specific areas, people, infrastructure or environments

Open standards are compatible with external layers from other institutions, OpenStreetMap, Google Satellite or elsewhere.

MAPS CREATION / MAP VISUALIZATION

Serve risk data to external web maps focused on specific disaster scenarios or events

Features a web-based styles editor to create maps.

Sri Lanka Ministry of Disaster Management

Disaster Management Centre

WORLD BANK GROUP

GFDRR

http://riskinfo.lk

Desinventar in Open Data Portal

Real-time Geospatial Smart Apps Development

- Awareness for risk mitigation

- Forecasting and Tracking

- Disaster Status Visualization

- Evacuation and Rescue

- Damage assessment

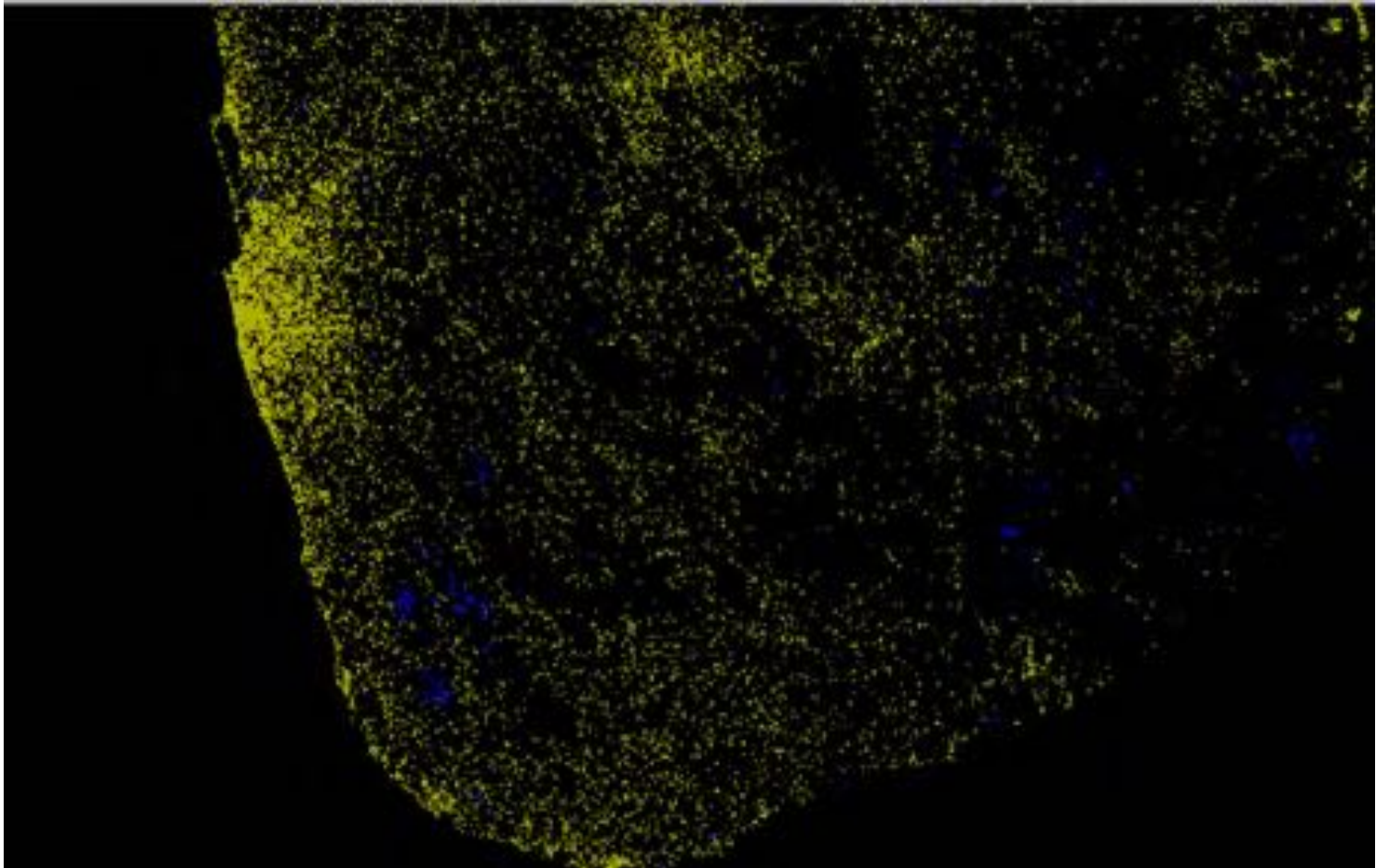- Command and Control

- Utility Planning and Response to requirements

- Monitoring of residual hazard to avoid secondary disasters

- **"APADA" APP**

Any Device | Anywhere | Anytime | Anyone
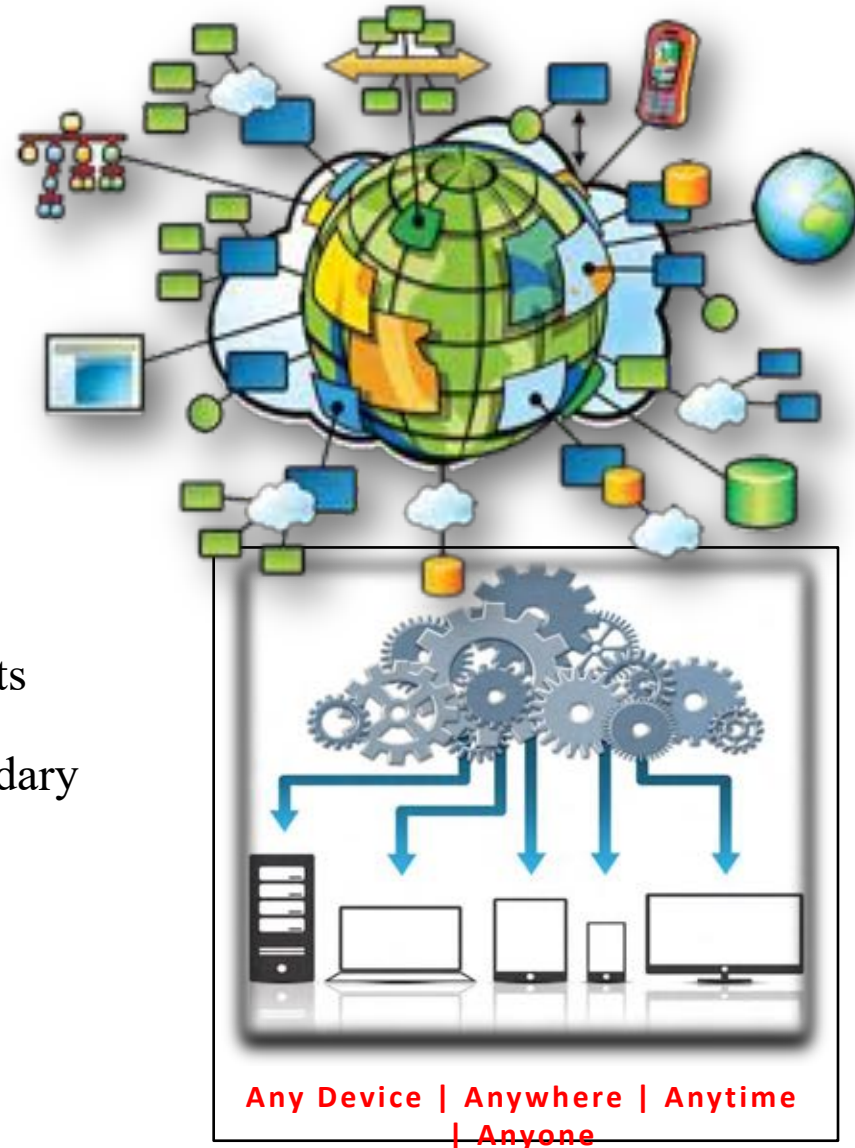
International Chatter Support

- JAXA, Sentinel Asia and International Chatter Support for emergency Mapping

Spatial Data for SFDRR Monitoring

Data Repository has been developed with the technical support of UNSPIDER Stocktaking and collecting all available spatial data for SFDRR reporting

Institutes Providing Disaster Specific Spatial Data in Sri Lanka

Disaster and Sector information	Department/Institutes Responsible
Droughts	International water management institute (IWMI)
Floods	Disaster management Centre (DMC), IWMI, CCMD
Landslides	National Building research organization(NBRO)
Tsunami information & early warning	Meteorological department
Aquatic resources and fisheries data	National aquatic resources and research department(NARA),Marine Environment Protection (MEPA)
Coastal Erosion	Department of coastal conservation (CCMD)
Economic losses	Department of census and statistics
Additional Spatial data and in-situ information	National Spatial Data Infrastructure (NSDI)

Opportunities

- Effective disaster risk reduction and management can be achieved through the deployment of geospatial data for all the phases of disaster management, including prevention, mitigation, preparedness, vulnerability reduction, response and relief

- Rapid Mapping

- A Nations Plan to empower its people through ICT

- National Spatial Data infrastructure under ICTA

Challengers

- **Data Sharing and Collaboration**
  - Need to get the government approval – takes time

  - Lack of interest in some organizations for collaborations

  - No compatible institutions to develop collaborations (compatibility in terms of same interest on activities carried out)

  - Due to some restrictions, some government institutions prefer to have collaborations with the institutions within the same ministry

  - Difficulties due to trans-boundary cooperation of regional partners in the use of geospatial data for disaster emergency response (SAARC).

- **Data security and copyright issues**
  - Data is stored in a central database and the access for data is only through a LAN

  - Password protection for the computers

  - Restrictions of using mobile storage devices on computers
- **Capacity Development**
  - Collection, representation and integration of Spatial data
  - Analytical and Interpretation Capacity
  - Interpretation capacity
- **Resources**
  - Limited Free access data
  - Limited Funding

Thank You