Aerial view of the 2013 Jan flood in Limpopo river, near Xaixai, Mozambique

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Global Facility for Disaster Reduction and Recovery

Mainstreaming Space Technology for Effective Disaster Management – towards resilient societies

UNOOSA ISDR IAM, March 12, 2013

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GFDRR Labs, East Asia and Pacific DRM team, World Bank Group

Poverty Reduction through Effective Disaster Risk Management and Climate Change Adaptation

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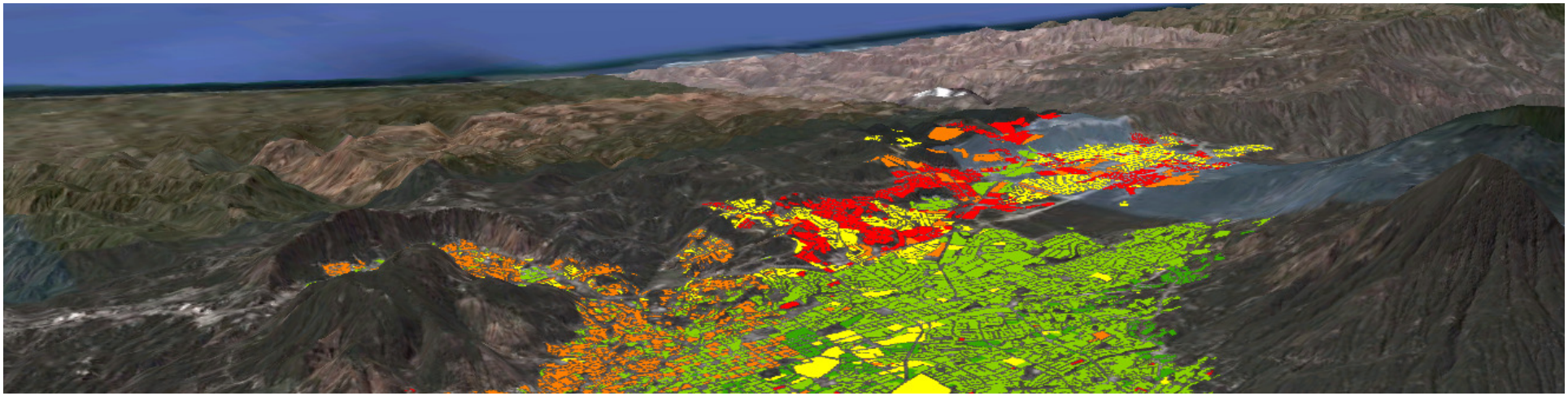
…offers a range of analytical and advisory services that are directly impacting on the ability of high-risk, low income countries to understand and act on the hazards they face, helping them adapt to a changing climate.



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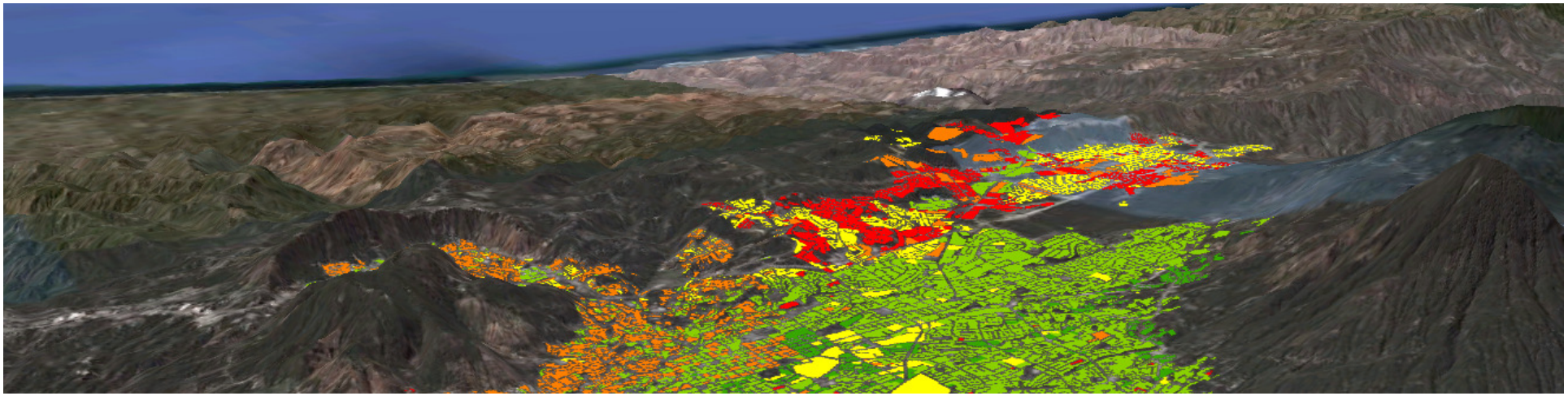
GFDRR Labs mission

to use science, technology and innovation to inform decision making; to reduce the vulnerability of the developing world to disasters in a changing climate



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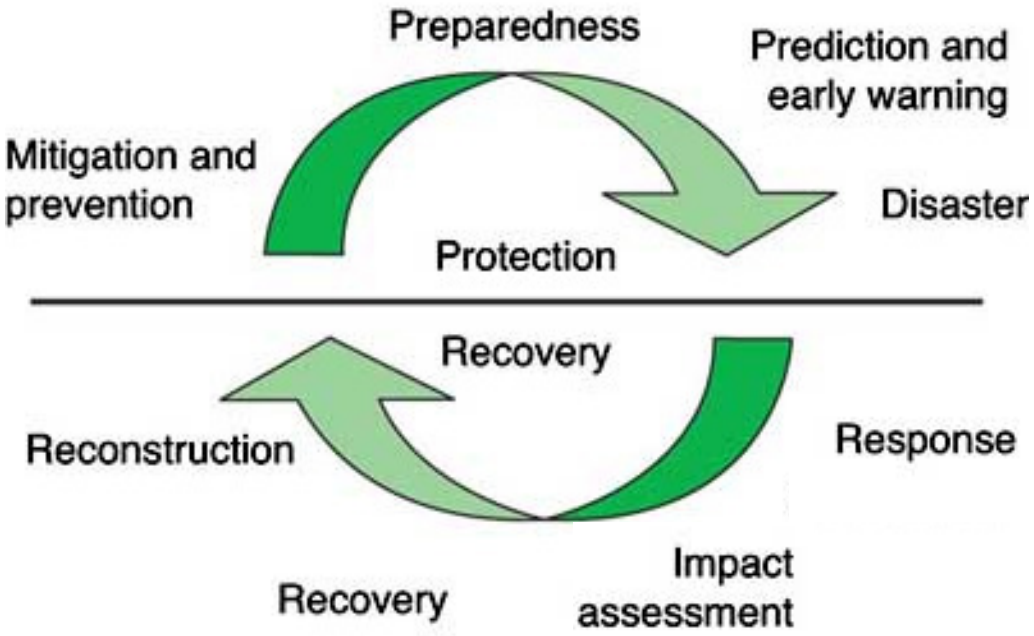
DRM cycle



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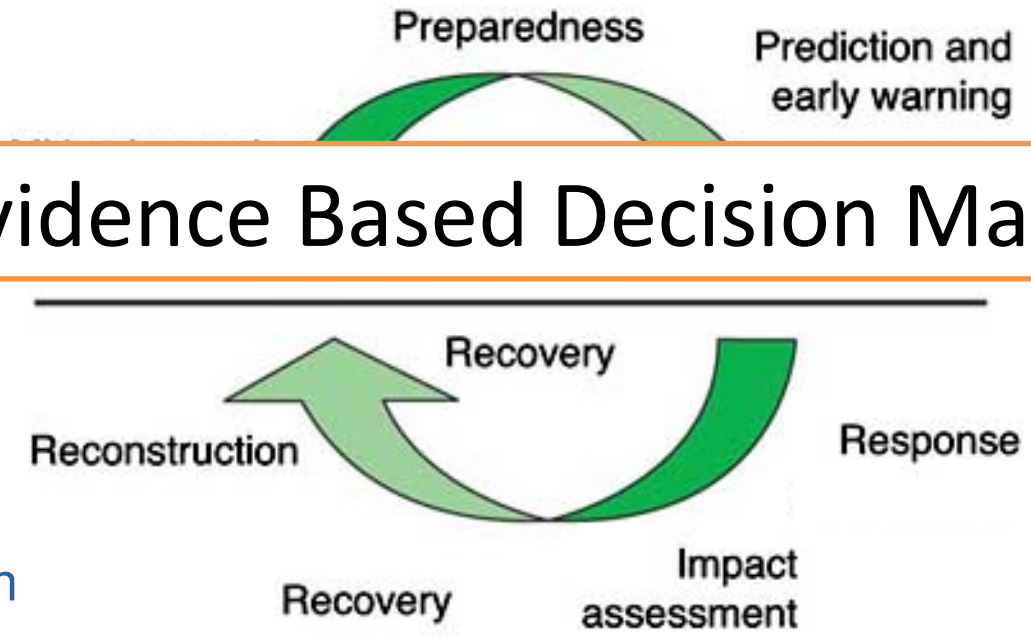
DRM cycle

Disaster Risk Assessment, Risk Financing

Data Preparedness

Monitoring Weather and Land Conditions



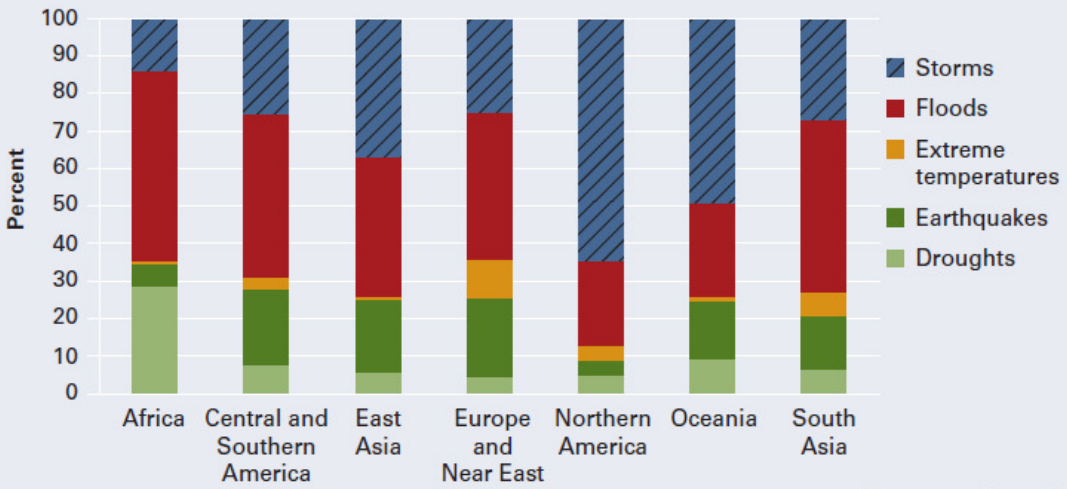
Evidence Based Decision Making

Monitoring Reconstruction

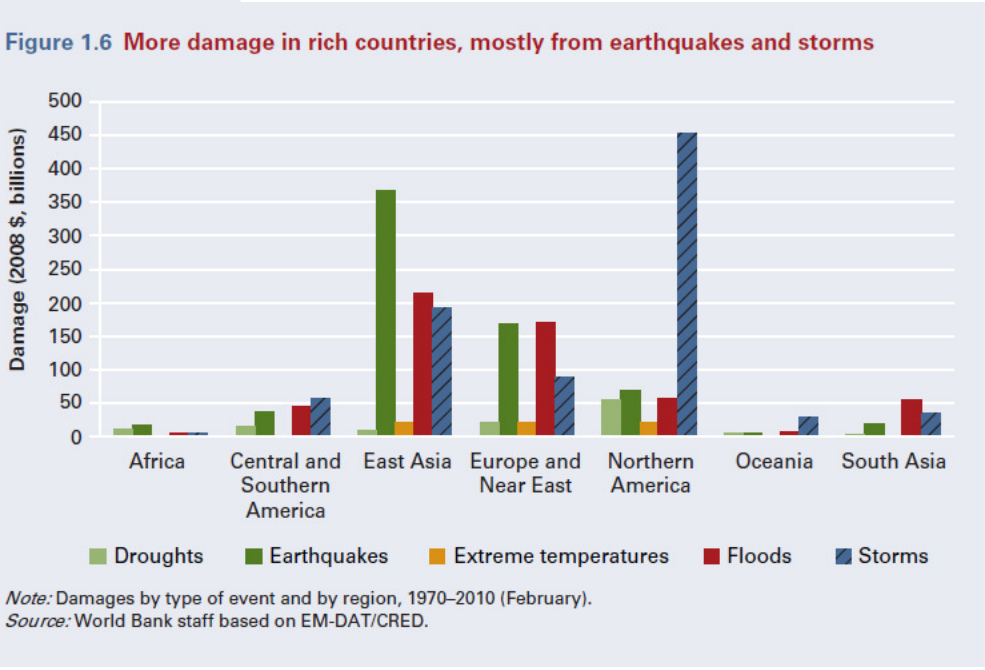
Situational Awareness

Post Disaster Needs Assessment (PDNA)

Rural areas and Floods



Both from the frequency and economic damage point of view, Floods are one of the most damaging hazards globally.



Taken from "Natural hazards, unnatural disasters", by Sanghi et al, GFDRR, 2010

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High proportion of flood events in GFDRR PDNA portfolio affecting rural areas

Bhutan	2011	Earthquake
Pakistan	2011	Flood
Thailand	2011	Flood
Djibouti	2011	Drought
Kenya	2011	Drought
Lao PDR	2011	Typhoon
Lesotho	2011	Flood
Uganda	2010-11	Drought
Benin	2010	Flood
Togo	2010	Flood
Pakistan	2010	Flood
Moldova	2010	Flood
Haiti	2010	Earthquake
El Salvador	2010	Tropical Storm
Cambodia	2009	Cyclone
Lao PDR	2009	Cyclone
Indonesia	2009	Earthquake
Samoa	2009	Tsunami
Philippines	2009	Cyclone
Bhutan	2009	Earthquake
Burkina Faso	2009	Flood
Senegal	2009	Flood
Central African Republic	2009	Flood
Namibia	2009	Flood
Yemen	2008	Tropical Storm
Haiti	2008	Hurricane
India	2008	Flood
Myanmar	2008	Cyclone
Bolivia	2008	Flood

More than 50% of PDNAs that WB/GFDRR have provided technical assistance to are flood events.

(From GFDRR website)

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Two types of floods

- Medium in size, frequent, annually recurring events (e.g. Mozambique, Malawi, Tajikistan)
- Large in size, less frequent “tail end” events (e.g. Pakistan 2010, Thailand 2011)
- Governments need to come up with impact estimates quickly. Need for a rapid impact assessment tool for both medium and large scale events

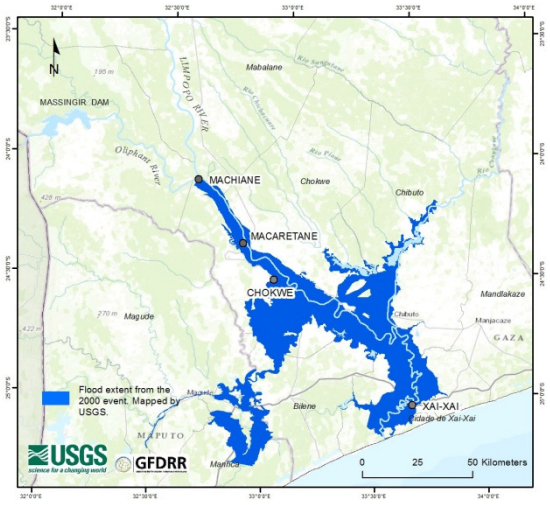
What we need for rapid impact assessments

(1) Maximum inundation extent

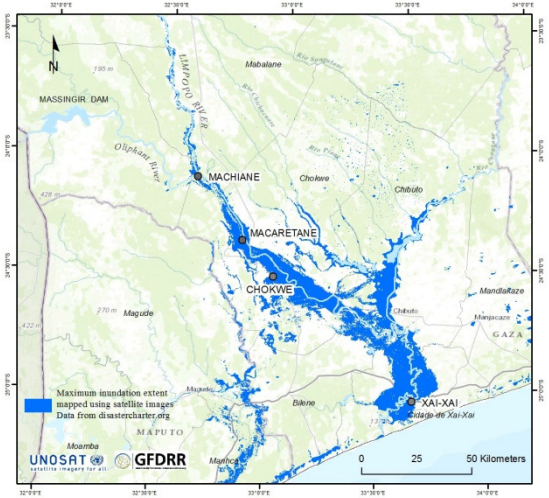
(2) Spatially mapped asset data

(3) Overlay hazard with exposed assets to come up with direct damage by sector.

Hazard layer mapped using NASA MODIS and UNOSAT mapped inundation using Radarsat-2 in the southern delta area for the Niaeria PDNA 2012



Mozambique flood extent from the devastating 2000 flood event, mapped by USGS



Mozambique flood extent from the recent 2013 event, mapped by UNOSAT

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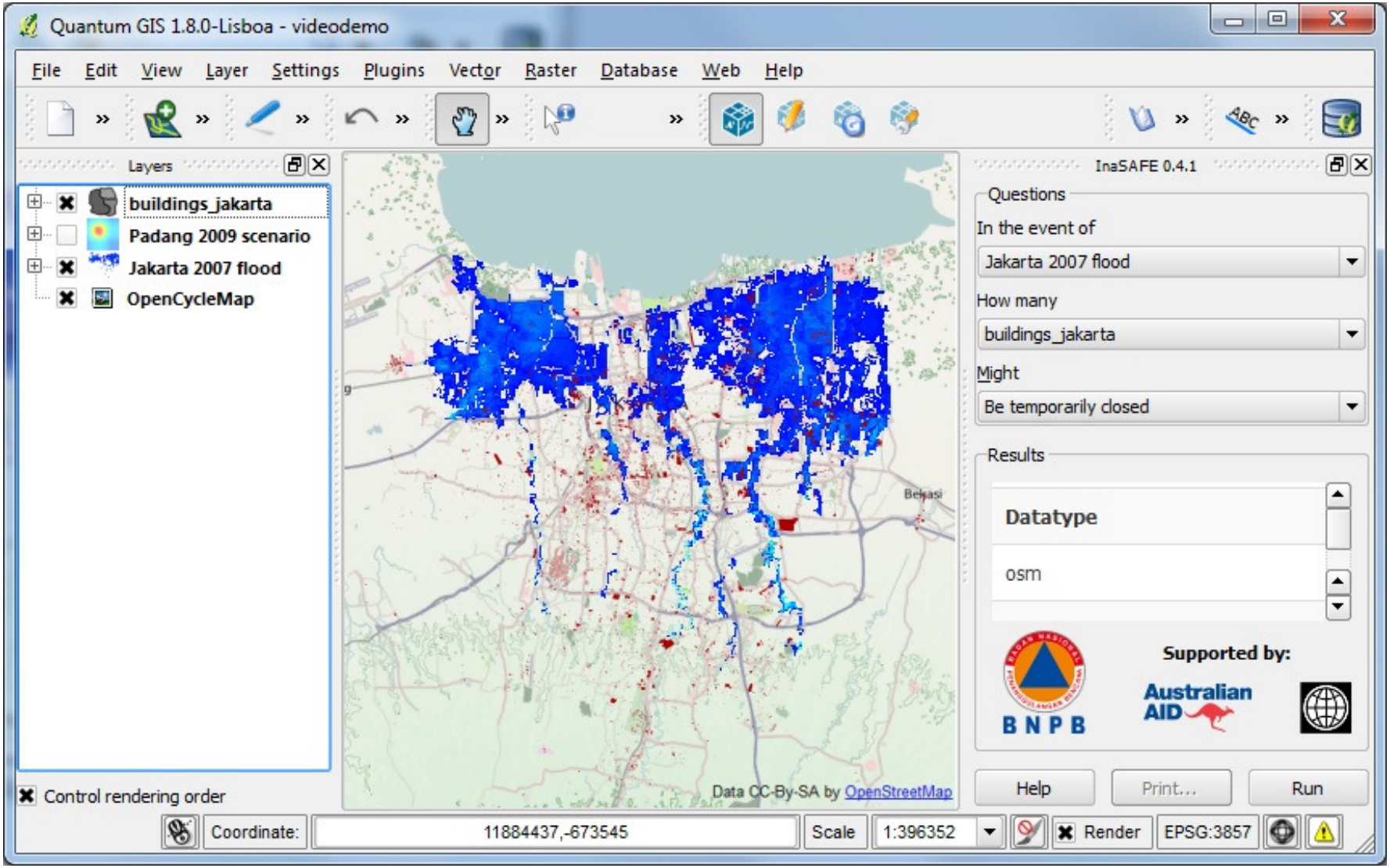
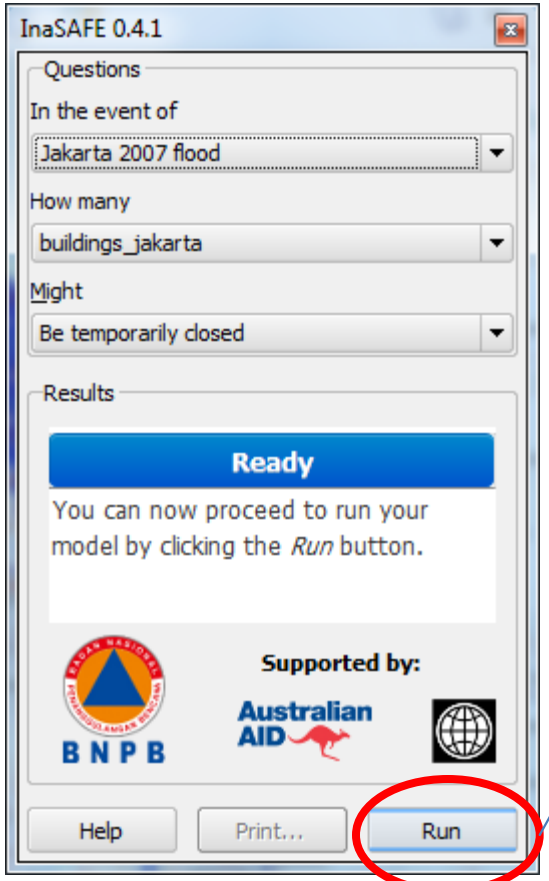
InaSafe Impact Analysis (ex-ante)



(East Asia and Pacific DRM Team)



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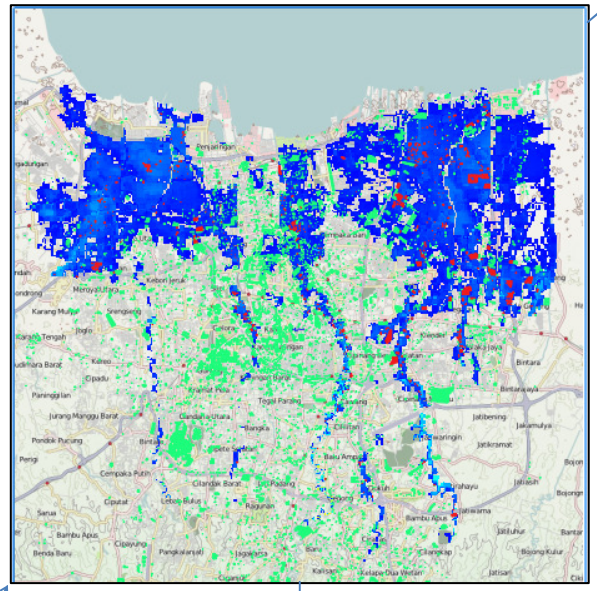
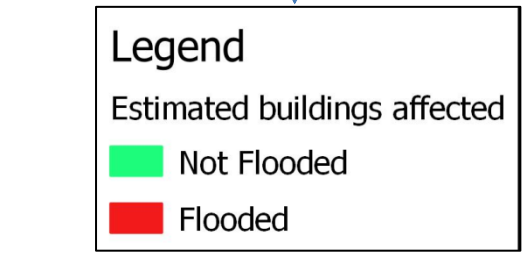
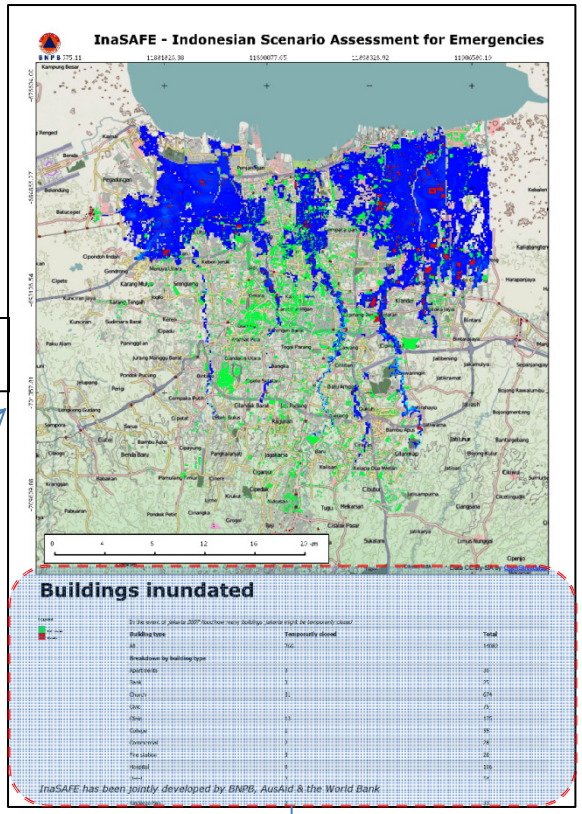
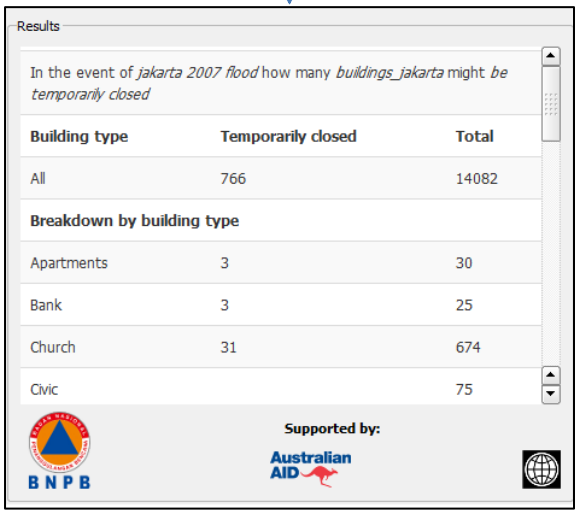




PDF





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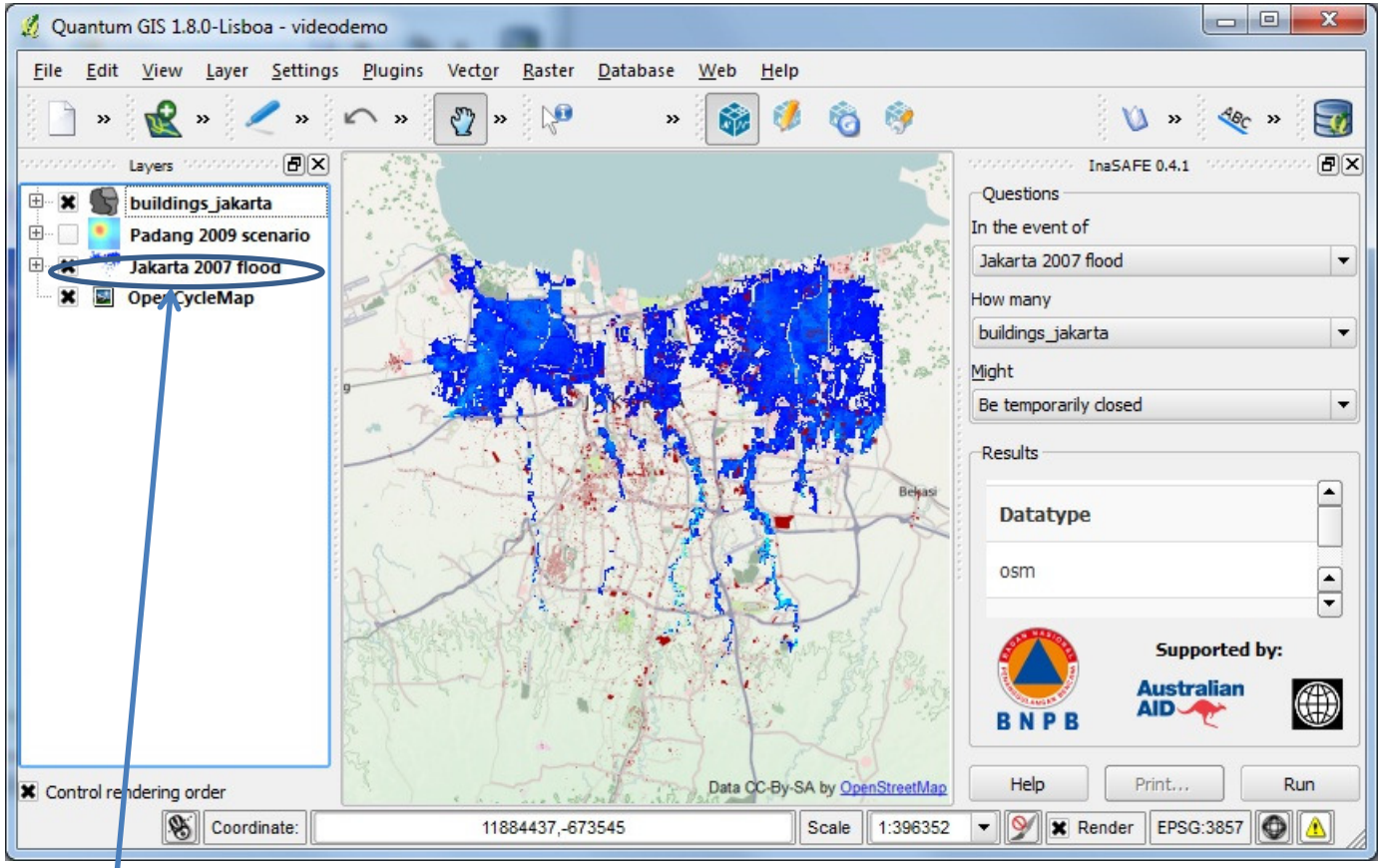
InaSafe rapid impact analysis (planned)



- Replace model hazard layer with actual inundation extent from remotely sensed data
- Data sources: Optical (NASA MODIS), Radar and Microwave (JRC). Collaboration on-going with all three data sources.

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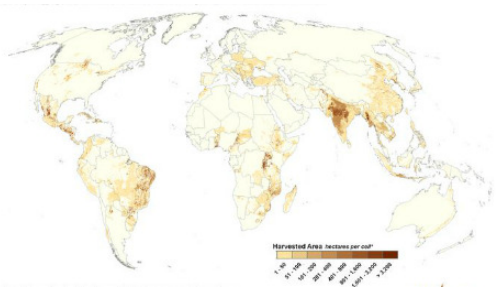
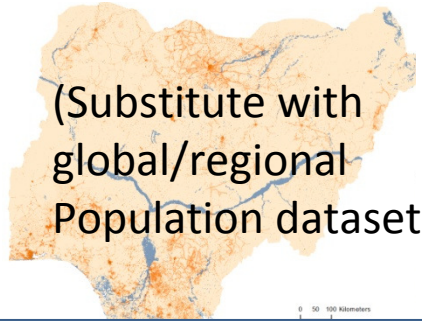
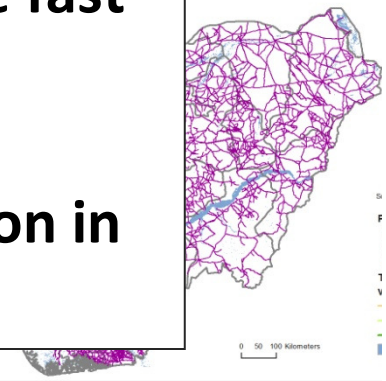
Hazard data is half the story: need for asset/exposure data

	Agriculture	Housing	Transportation
Global datasets		 (Substitute with global/regional Population datasets)	N/A
National datasets	 Min. of Agriculture Land use land cover	 NASDRA settlements	 NASDRA Road network

SPAM (m

Vintage of data very important

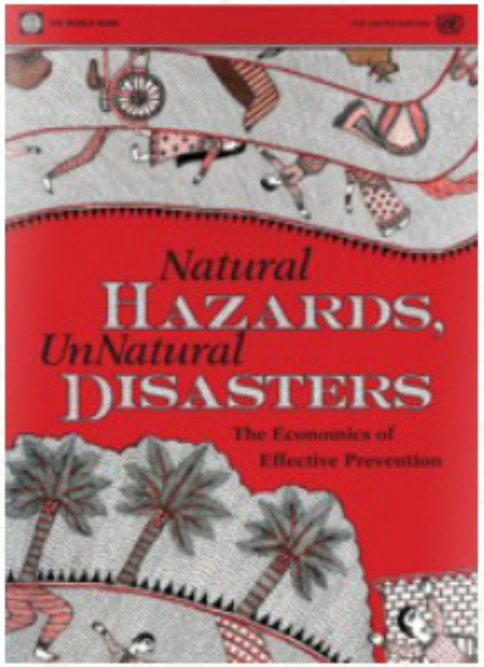
How can we keep the data up to date in the fast changing environment and climate?

What are the obstacles to obtain information in near real-time?

The **Open Data for Resilience Initiative (OpenDRI)** encourages and facilitates the sharing of climate and disaster data to enable more effective decision-making by providing the rationale, technical assistance, and tools for data sharing.

The first policy implication detailed within the recent **Natural Hazards, Unnatural Disasters: The Economics of Effective Prevention** report highlights the importance of information sharing in effective Disaster Risk Management.

OpenDRI is implementing this recommendation in 25 countries around the world to improve disaster and climate resilience



Helping Governments Manage and Share Their Own Data (OpenDRI)

MASDAP *Promoting sharing of geospatial data for a disaster resilient Malawi* Sign in

Malawi Spatial Data Portal

In order to build resilience to disasters in a changing climate, policy-makers, stakeholders and the public must have easier access to the information and make effective use of it. The Open Data for Resilience Initiative (OpenDRI) is a global partnership that seeks to build data sharing programs along with the capacity and tools to use data to make more informed decisions.

This platform is for spatial data sharing in Malawi for better coordination in disaster management and resilience building in the country. The project is a collaboration between the Malawi Government and the World Bank through the government ministries.

Explore Maps Create Map

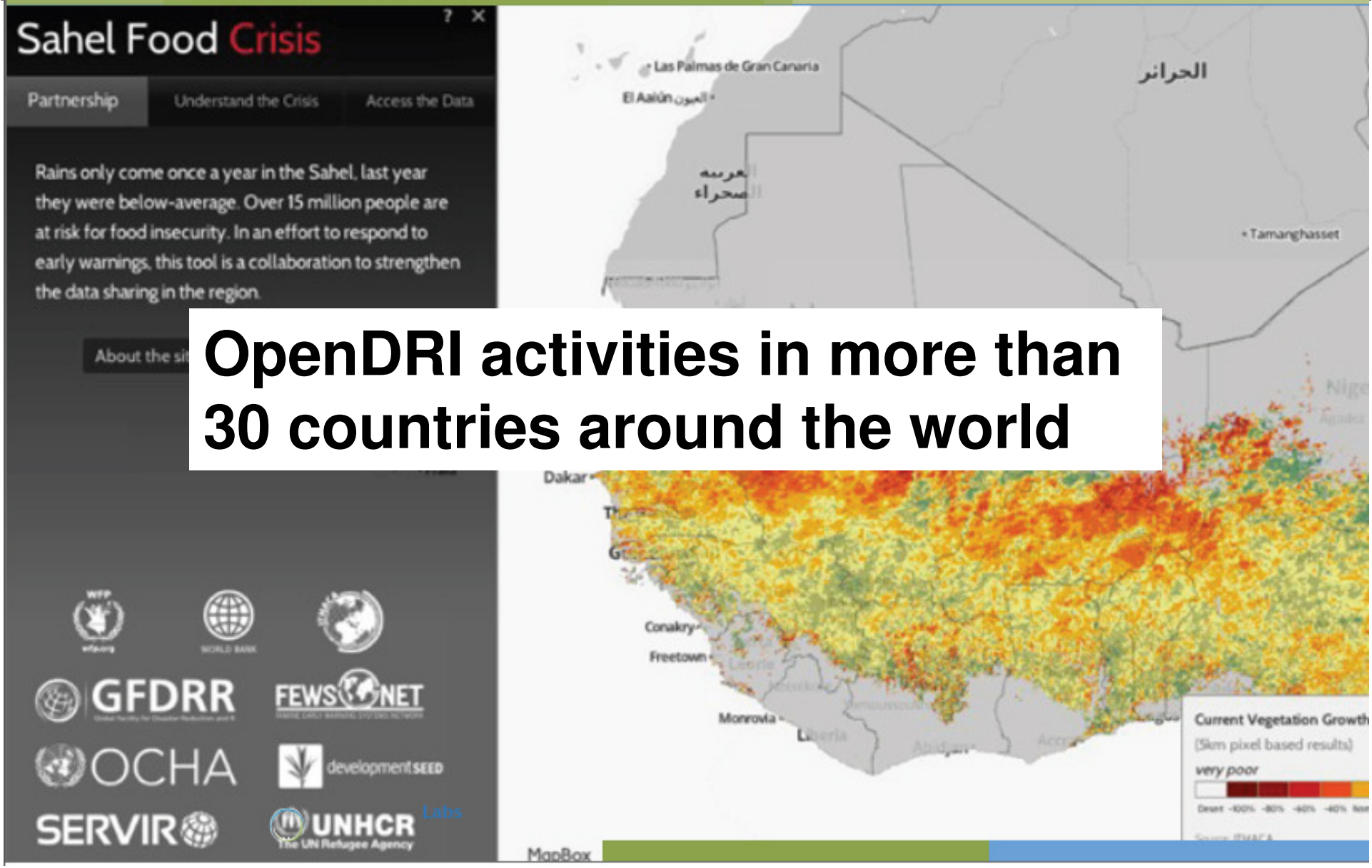
Data Search

Advanced Search

Upload data

Powered by GeoNode | Need Help? Help English

SahelResponse.org – International Collaboration



OpenDRI activities in more than 30 countries around the world

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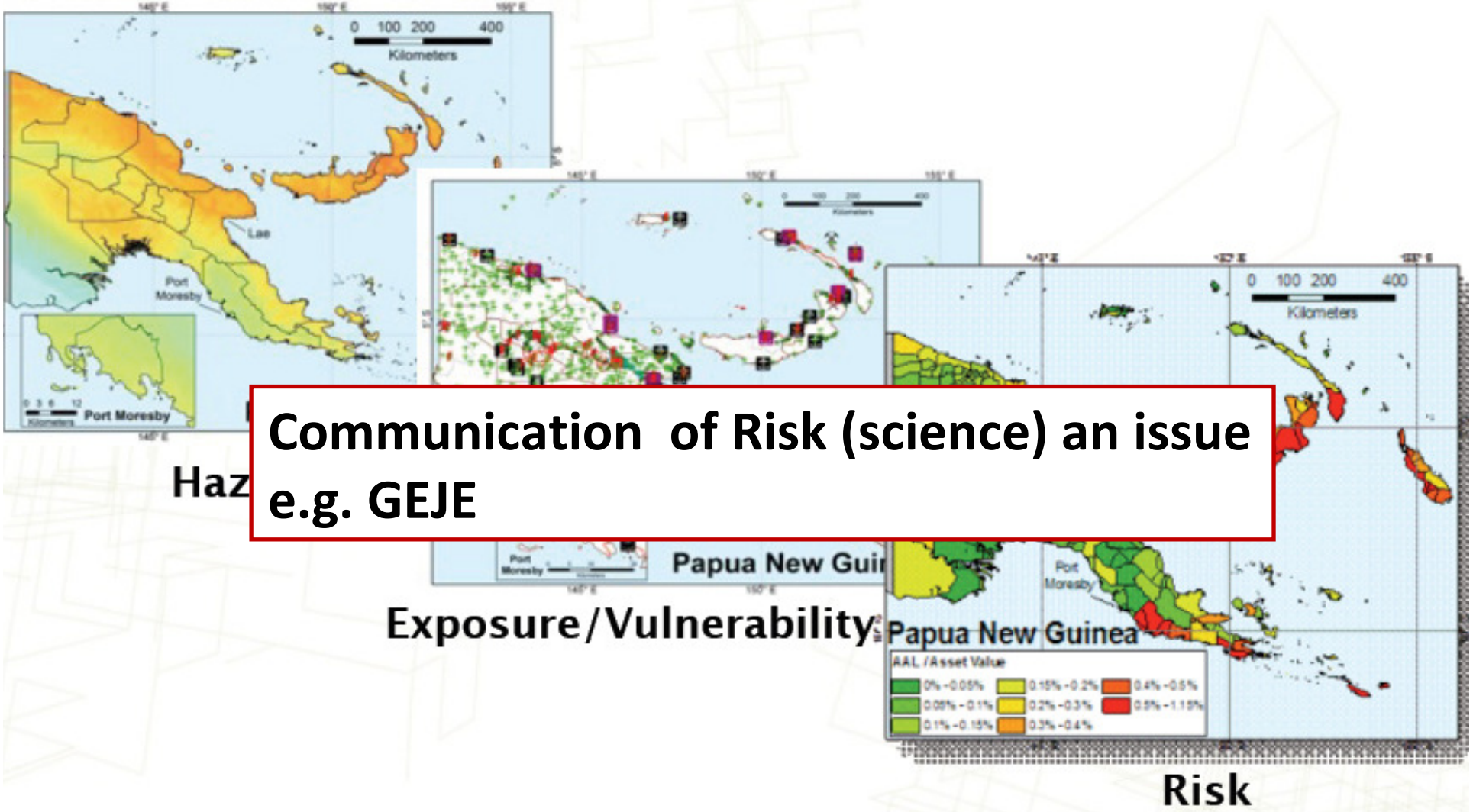
From Disaster Response to Disaster Risk Identification and Reduction



Communication of Risk (science) an issue e.g. GEJE

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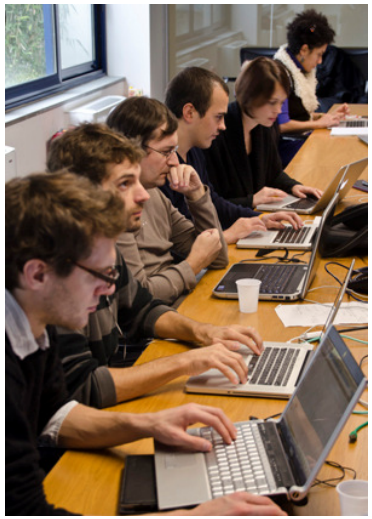
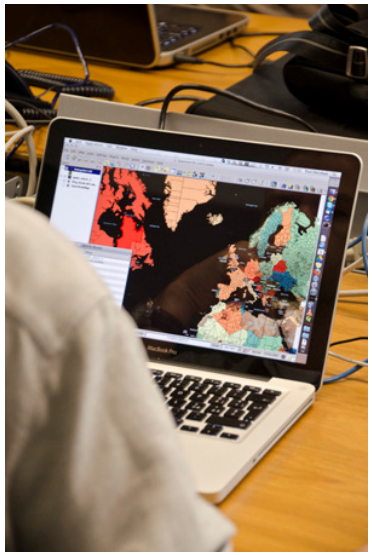
Collaborative Spatial Assessment (CoSA) for impact assessments

- Trilateral agreement on PDNA (EU, UN and WB) since 2008 – CoSA is focused on collaboration in the use of remote sensing for PDNA. Started following 2010 Haiti earthquake.
- 2010 summer Pakistan PDNA was the first flood event for CoSA.
- 2012 Nov Sprint saw EU, UN-ITHACA and GFDRR collaborate on prototyping hazard layer tool, based on NASA's MODIS global flood maps system.

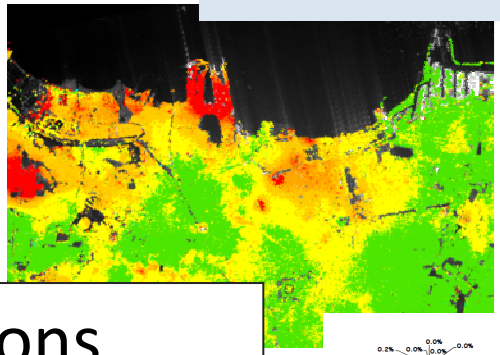


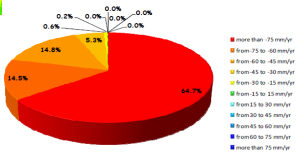


Collaboration with European Space Agency – knowledge building within World Bank

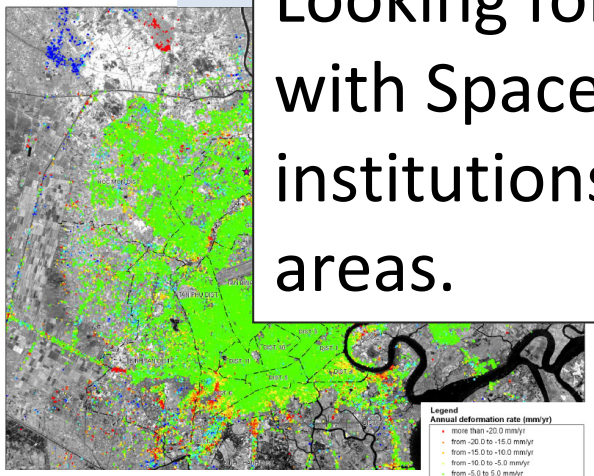
Demonstration of the value of using satellite EO data for urban risk assessment, hazard and exposure mapping, Interferometry for land subsidence/deformation studies.

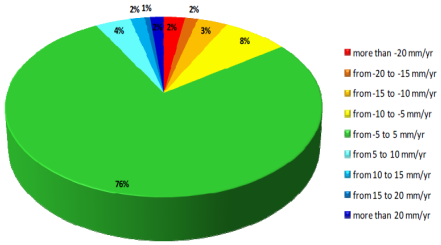
Land Subsidence in Jakarta, 2011



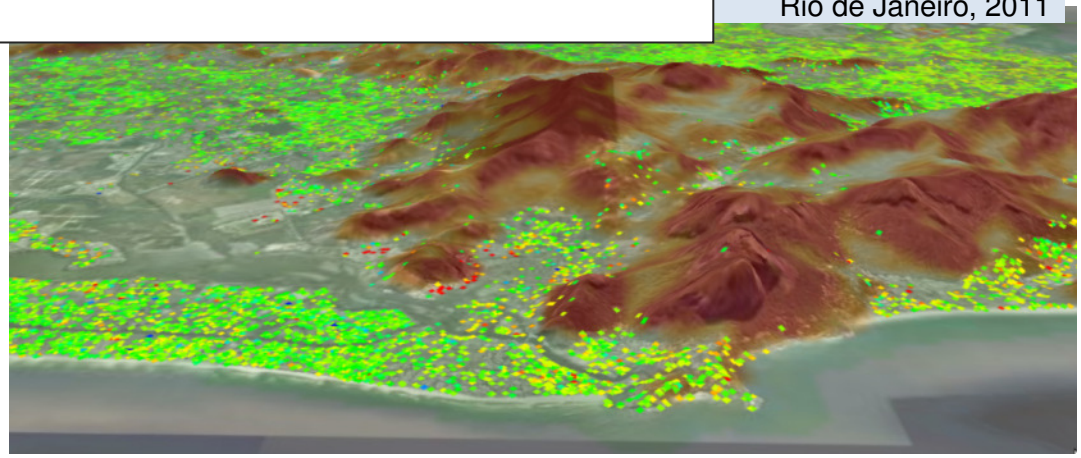


Looking for more collaborations with Space Agencies and other institutions with expertise in these areas.





slide susceptibility map of Rio de Janeiro, 2011



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Ultimately…….Tsunami damage assessment Following the Great East Japan Earthquake

- GEJE showed great examples of data preparedness.

- Latest Commercial exposure/asset data was overlaid on tsunami inundation extent and aerial photos for claim validation both by government agencies and private insurance companies.

- OpenDRI related activities help improve preparedness of asset data.

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Summary

- Looking to promote use of space based technologies in all phases of the disaster cycle
- Connecting the ex-ante with ex-post key (RA to PDNA, reconstruction)
- Focusing currently on flood impact assessment tools
- Mainstreaming RS into the operational environment in our client countries
- Promoting data sharing through OpenDRI, particularly amongst line ministries
- Leverage existing activities both at national and international level
- For DRM, Hazard as well as Exposure data key, how can we move to a near real time data capture environment
- Improved Global model availability, OpenDRI (bottom up), GAR 15' (Top Down) = opportunity