ICT APPLICATIONS FOR DRR

Academy of ICT Essentials for Government Leaders ICT for Disaster Risk Management

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Director

UN APCICT

Asian Pacific Training Center for ICTD (APCICT)'s Mandate

Human and Institutional ICT capacity of ESCAP member States

APCICT's Major Activities

1

Capacity Building

To deepen the knowledge of policymakers and civil servants

2

Technical Assistance

Policy, strategy

3

E-learning & Knowledge Sharing Platforms

1 Capacity Building Programmes

Policy Makers/ Gov't Officials	Women Entrepreneurs	Future Leaders
ACADEMY Academy of ICT Essentials for Government Leaders	**WIFI** Women ICT Frontier Initiative	**PRIMER** Primer Series on ICTD for Youth

Myanmar

Bhutan

Philippines

Officially integrated into the **Curriculum** of the **Civil Service Training** Institutions

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ACADEMY

Academy of ICT Essentials for Government Leaders

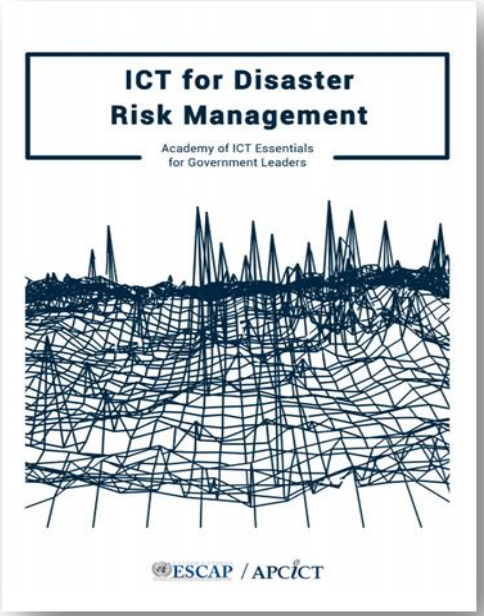
4 Theme Categories for training programs

- Introductory — 3 courses
- Digital Government Transformation — 4 courses
- Digital Society & Inclusion — 5 courses

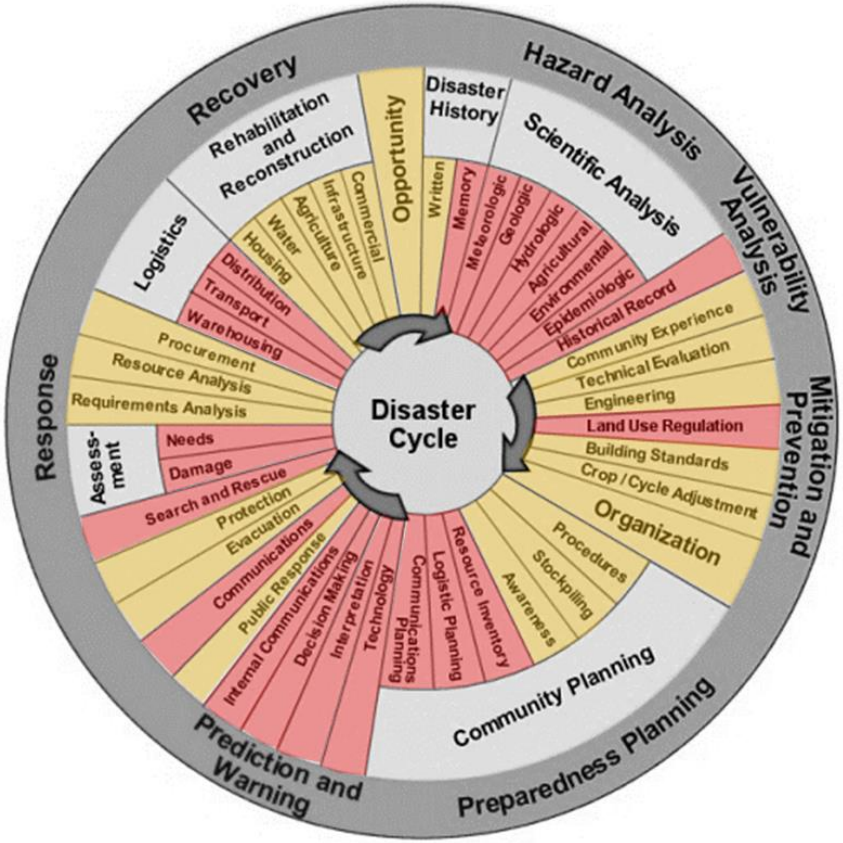
Borderless

- Climate Change
- Disaster Risk Mgmt.
- ICT for COVID-19

ICT for Disaster Risk Management



DRM cycle and the role of ICTs in various activities and phases



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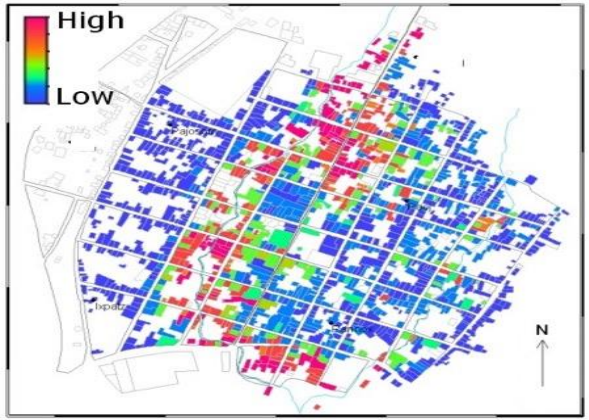
Disaster Risk is a Spatial Problem



Risk map of an urban area subject to flooding
(source: RiskCity, ITC/Peters Guarin)

Geospatial Data is Important in all phases of the DRM cycle

Understanding risk

Analyzing risk

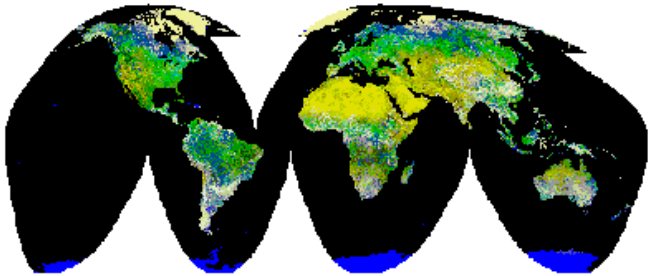
Communicating risk

ICTs can help not only to collect data, but also analyze and disseminate the outputs for effective DRM.

ICT Applications for DRM (1)

Satellite Remote Sensing:

- **Earth observation satellites** provides sub-meter level data with very detail information about the elements-at-risk, and also contributes in **post disaster response activities**.
- **Communication satellites** are being used in **disaster preparedness activities** such as early warnings and evacuation.

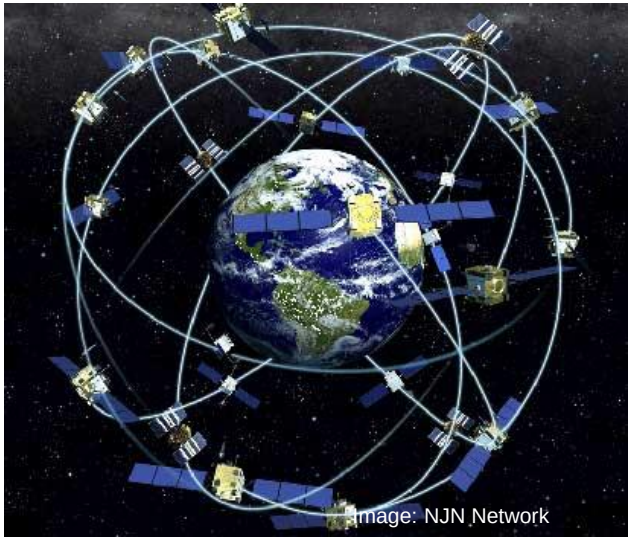


ICT Applications for DRM (2)

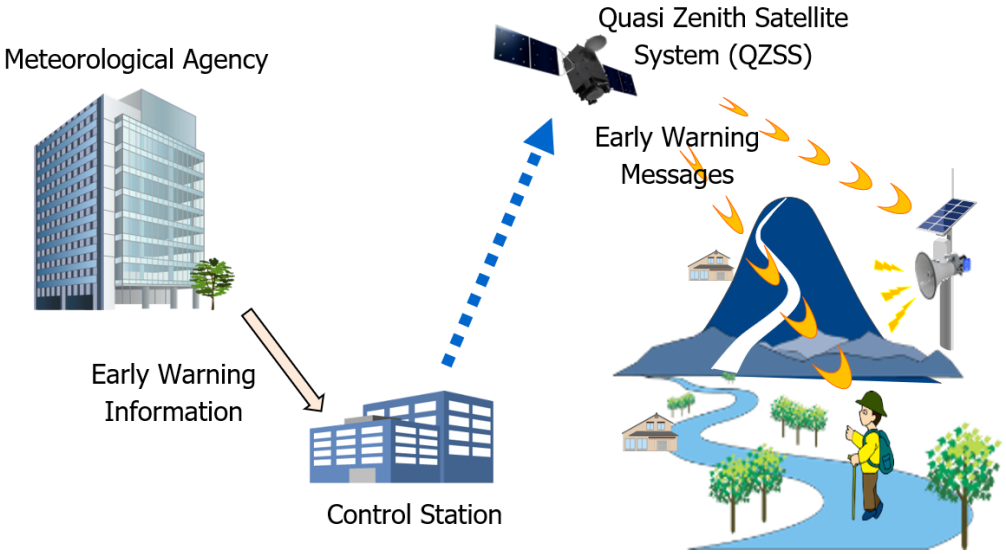
Global Navigation Satellite System (GNSS):

GNSS enabled services are being used for:

- **Disaster preparedness activities** - monitoring of earth movements (e.g. landslides), sending early warnings to remote locations.
- **Disaster response activities**.



Sending Early Warnings Using GNSS

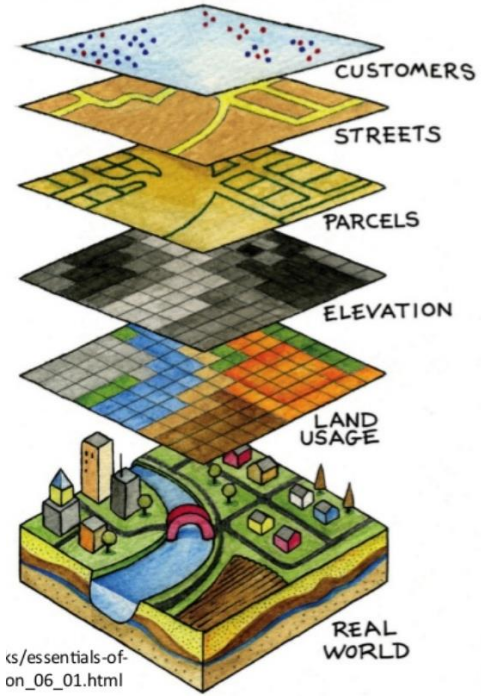


Quasi Zenith Satellite System (QZSS) is one of the Global Navigation Satellite Systems that supports short-messaging facilities for early warnings (Suzuki, 2019).

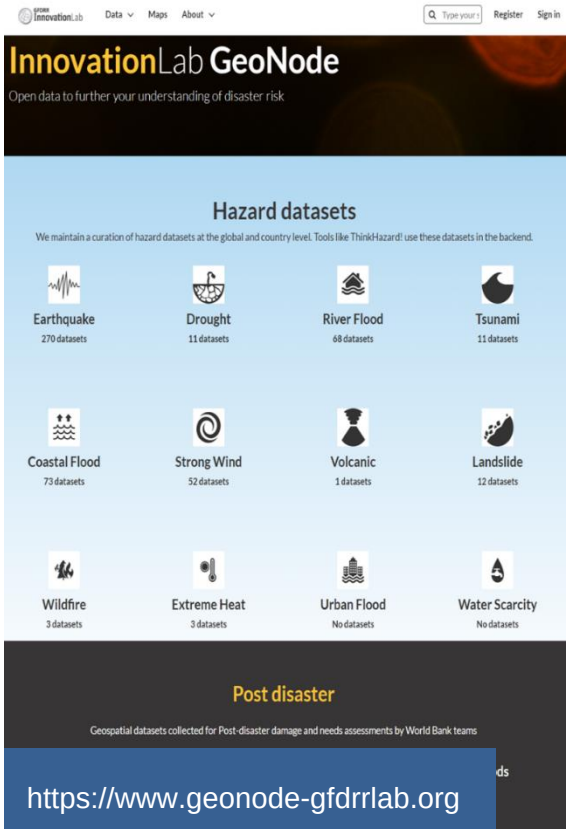
ICT Applications for DRM (3)

Geographical Information Systems (GIS)

- Used in **all phases of DRM cycle**
- GIS provides a platform to analyze and integrate data coming from various sources and prepare specific products for all phase of DRM.



GeoNode



- **A geospatial content management system**, a platform for the management and publication of geospatial data.
- Bringing together mature and stable open-source software projects under a consistent and easy-to-use interface, allowing non-specialized users to share data and create interactive maps

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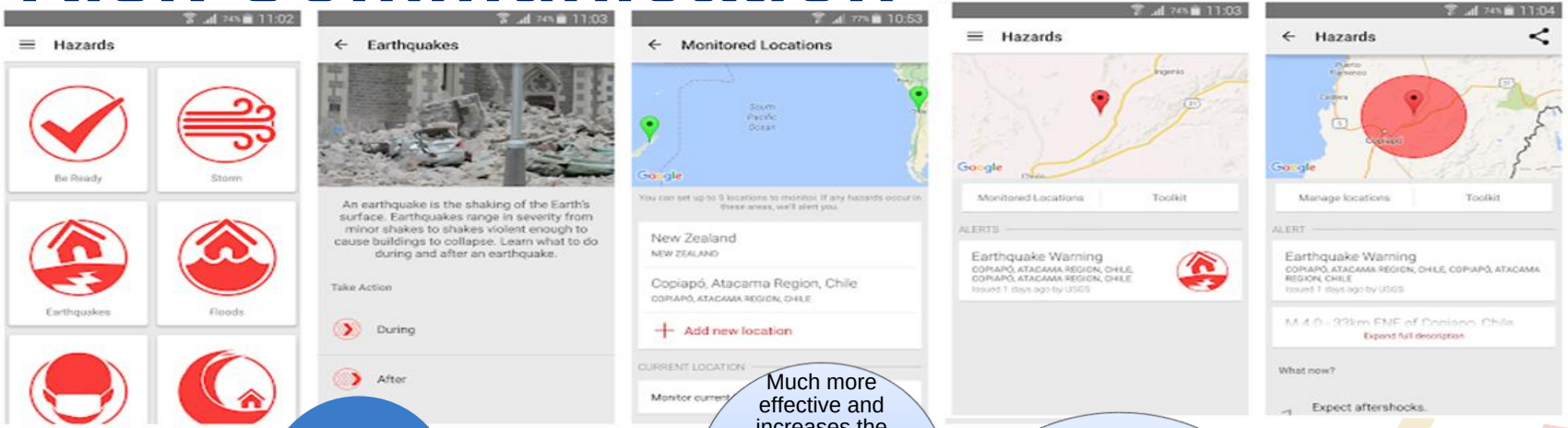
Risk Communication



Top-down transfer of information from authorities to the public

Innovative ways through website, movies or soaps with disaster related issues, radio-TV programs and games

One-way risk communication channel

Communicated via mass media (television, radio, newspaper, and websites)

Much more effective and increases the involvement of the general public as stakeholders in the decision making

Two-way risk communication channel

through social media and mobile apps

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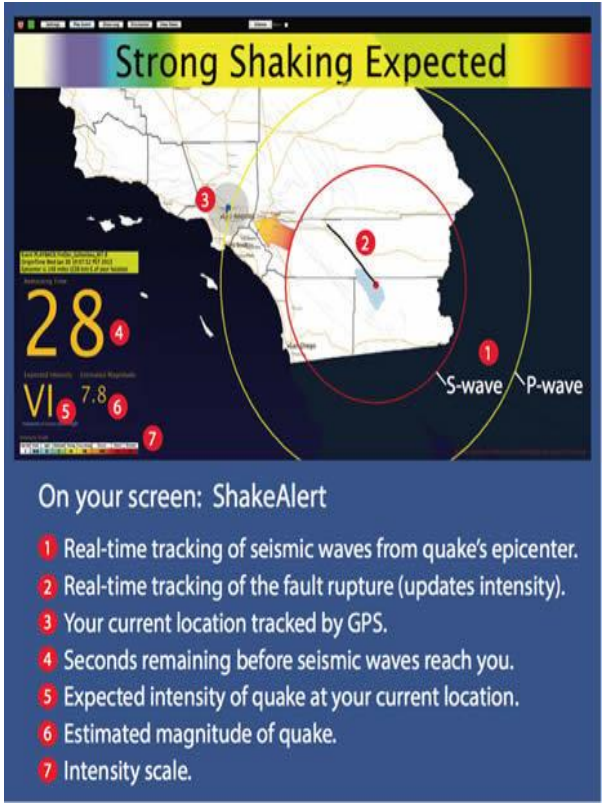
ICT for Disaster Preparedness

Monitoring System	Alarm System	Warning System	Forecasting System	Nowcasting System
Primarily installed to increase the understanding of natural processes but can also be utilized to plan further actions.	Detect the dangerous process and initiate an alarm automatically, e.g., flashlights / sirens.	Detect significant changes in the environment (as precursors for mass movements) before the event occurs.	Predict the level of danger based on indicators at regional scale and regular intervals.	Predict the level of hazard based on near real time data.

Example: Alert and Evacuation



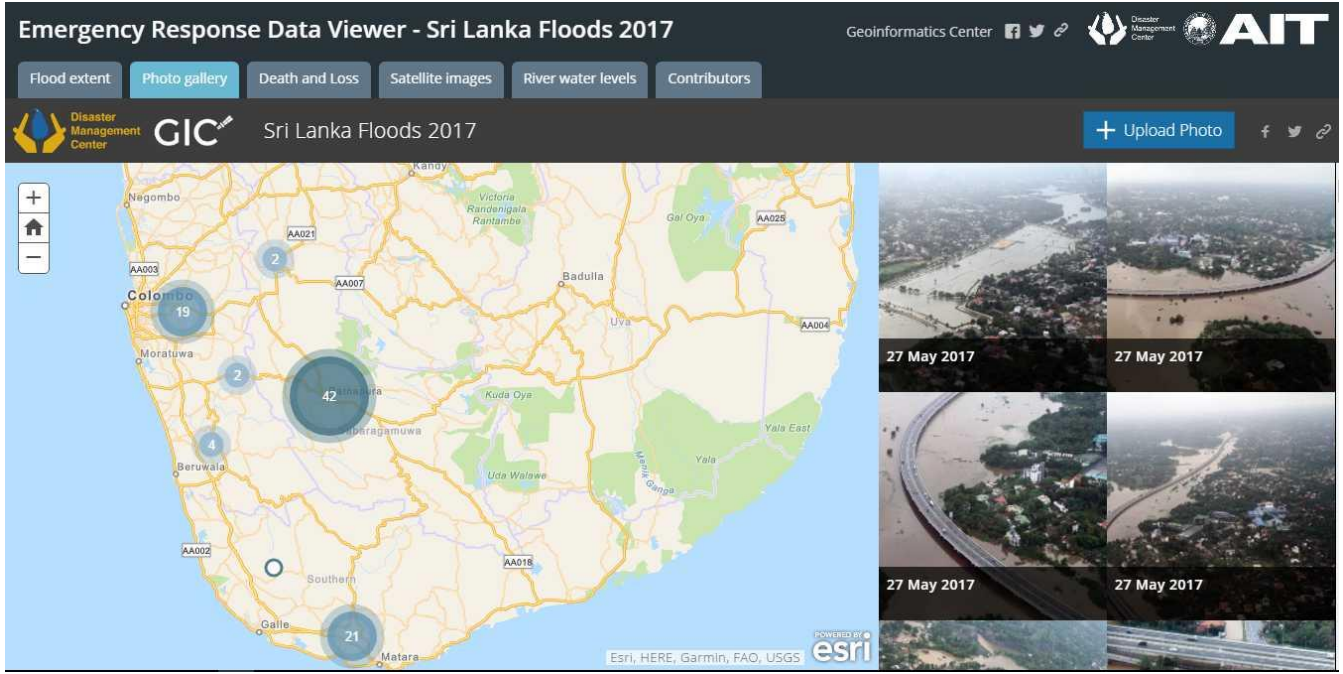
Alerting:

In California, the ShakeAlert App has been developed. A user of ShakeAlert receives a message on the screen.

- The message alerts the user to how many seconds before the shaking waves arrive at their location and the expected intensity of shaking at that site.
- The warning message also displays a map with the location of the epicenter, the magnitude of the quake, and the current position of the P and S waves.

Example of an app for immediate earthquake warning: https://www.usgs.gov/natural-hazards/earthquake-hazards/early-warning

Example: Flood Emergency Response



A dynamic emergency response maps in response to the 2017 Sri Lanka floods. The data viewer combines satellite imagery with real-life photographs and incorporates river water levels, and data on loss and fatalities to provide an overview of the extent of the floods.

[Emergency Response Data Portal]

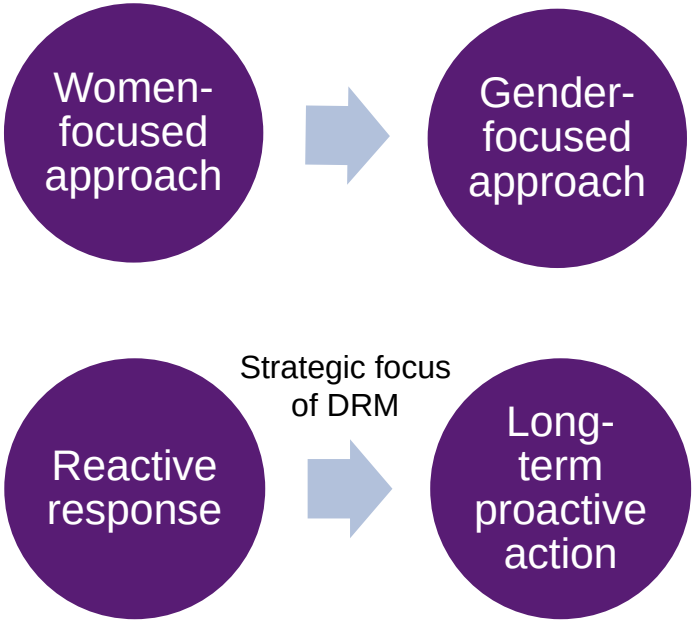
[Sri Lanka Flood Story Map]

Example: Earthquake Damage Assessment

Earthquake damage assessment using optical remote sensing imagery. The Haiti case study (Ajmar et al., 2010).

(Source: Google 2010)

Mainstreaming Gender into DRR

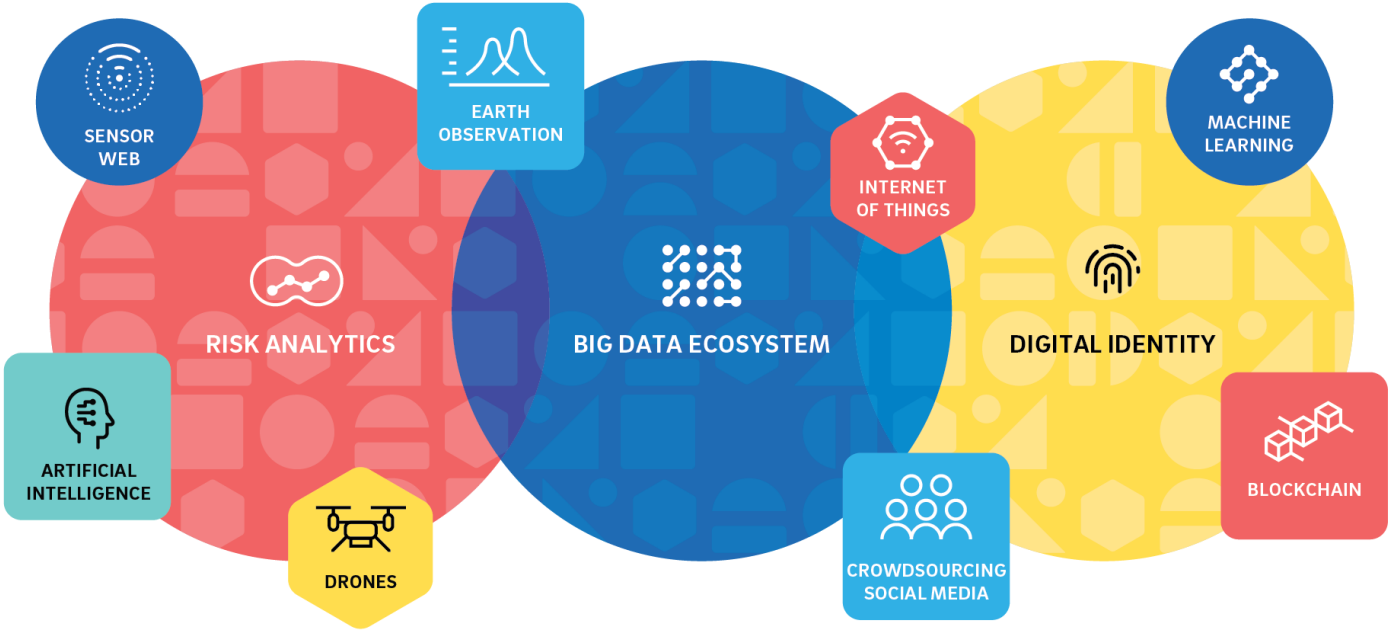


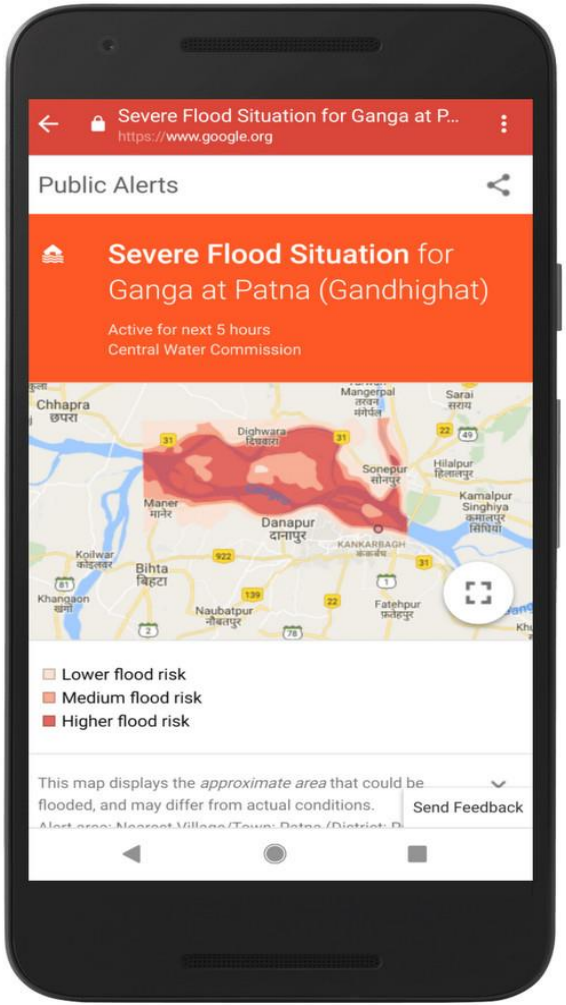
ICT has changed the way, and how we communicate, how we access and share information.

If ICT can be used in a gender sensitive way, ICT can help narrowing the economic and social gaps between women and men.

UN ESCAP's APDR 2019: Technological innovations for smart resilience

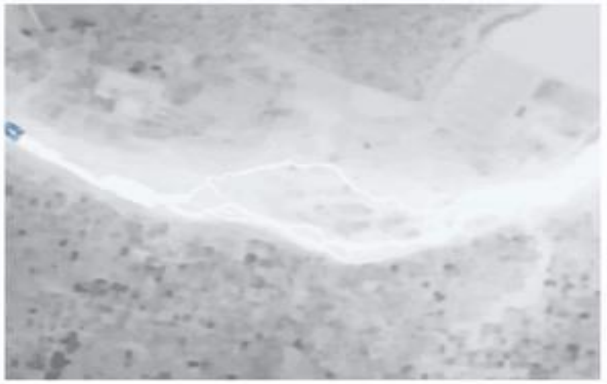
Early detection, Early Warning	Rapid diagnostics	Risk Governance/ Communication	Tele-health	Delivery of services





Global Google Public Alerts program (Big Data and Machine Learning)

AI-assisted flood predictions



AI and big data to create better forecasting models. A variety of elements—from historical events, to river level readings, to the terrain and elevation of a specific area—feed into these models.

It **generates maps and runs up to hundreds of thousands of simulations in each location to accurately predict** not only when and where a flood might occur, but the severity of the event as well.

THANK YOU

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