Overview of Academy Module on "ICT for Disaster Risk Management" (PART-II)



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Chapter 1: Introduction to DRR

What is a disaster Disaster trends Disaster Risk reduction /management Disaster management cycle Where does ICT play a major role? Main DRM workflows Examples in lecture



Hazard & risk materialize



Managing Disaster Risk



Disaster Risk Management cycle A continuous process of inter-linked phases that implement policies, strategies, and actions

Main goals (source: GDRC)

- Avoid or at least reduce the impact of hazards
- Assure appropriate support to victims of a disaster
- Achieve rapid and effective recovery after a disaster

Main actors

Governments, private sector, civil society & general public

A framework for disaster risk reduction

- Guiding the actors working together in implementing policies and measures to help reduce disaster risk
- Sendai Framework for Disaster Risk Reduction



DRM Workflow

Green: analyzing existing risk;

Blue: analyzing optimal risk reduction planning alternatives;

Red: analyzing possible changing risk in future scenarios;

Orange: analyzing change-proof risk reduction alternatives under future scenarios.

Source: van Westen et al., 2011.



Discussions

1. What is a disaster ?

Consider for yourself whether you would indicate the following situations a 'disaster':

- When you become ill, and cannot work anymore?
- When a famous football player is injured and misses the most important match, and his team loses the World Cup?
- When does a car accident become a disaster? The annual financial cost of car accidents in the US is estimated to be around 230 Billion dollars, with 2.9 million injuries and around 43,000 casualties.
- The death of 2,974 people in the attack on the Twin Towers on 9/11/2001?
- The financial crises that hit the world in 2008?
- Is COVID-19 a disaster?

You can also come up with other examples that illustrate that the definition of 'disaster' is not a very straightforward one and can also been seen at the level (e.g. of an individual, family community, society)

2. Using the GAR Atlas, find out for your country:

- What is the region with the highest flood hazard?
- What is the difference between return periods of 25 and 100 years?
- What data sources have been used by GAR to compile flood hazard maps of your country?
- What is the estimated 'Riverine Flood Average Annual Loss'?

Chapter 2: Data Requirements

The importance of data for DRR Data used for DRR and their availability

- Remote sensing
- Digital elevation data
- Thematic data
- Historical hazard/disaster data
- Hazard and risk data

Spatial Data Infrastructure



ESCAP / APCIC



Drones, UAV

WorldDEM

- Google Earth Engine
- FAO GeoNetworks

Data Portal



Discussions and Exercises

1. Evaluate Remote Sensing needs

- Identify the hazard type you are most interested in, and write down for yourself how it can be characterized in terms of its spatial and temporal properties, as well as possibly its spectral characteristics.
- Which spatial data types that you know already are useful to observe the hazard you selected? What relevant information can they provide?
- Try to fill in the checklist for steps

2. Google Earth

Open Google Earth (or install it if you don't have it yet). Review carefully the data coverage for your country, keeping in mind the hazards that are present. Evaluate how useful those data can be (also considering the 3D data) to study the hazards or elements at risk. What are the limitations?



Chapter 3: Risk Assessment

Understanding Disaster Risk and Risk Assessment Hazard, element-at-risk, vulnerability, and exposure Risk assessment approaches Tools for risk analysis Risk visualization Policy considerations





Risk Assessment Approaches





Assessment Platform



Exercises

Risk assessment and visualization

The aim of this task is that you use see a number of good examples of visualizations of hazard and risk information. Some examples are:

- Webpage for the national risk assessment of Georgia. Check out the options to do disaster reporting, query disaster database, hazard, exposure and risk, and generate a risk profile.
 - <u>http://drm.cenn.org/index.php/en/</u>
 - Also check the web-atlas at: https://issuu.com/levan.natsvlishvili/docs/binder1
- Website for national risk assessment for Tajikistan. Display and query hazard, elements-at-risk, loss and risk and generate a risk profile.
 - <u>http://tajirisk.ait.ac.th/</u>
- Website of an on-line risk assessment handbook, to support the generation and application of landslide and flood hazard and risk information to inform projects and program of planning and infrastructure sectors, specifically targeted to small countries in the Caribbean region. The methodology centers around a series of use cases, which are practical examples.
 - <u>http://www.charim.net/</u>



Chapter 4: Mitigation & Prevention

- Understanding disaster mitigation and prevention
- Stakeholders, objectives, and scales
- Risk information for decision making
- Risk perception, communication, and evaluation
- Analyzing risk reduction alternatives and possible future scenarios
- Decision Support Systems
- Policy considerations





Optimal Risk Reduction Measures



A: the existing situation for a cross section through a river valley.

B: the changing risk situation for the alternative of constructing embankments.

ESCAP / APCICT

Analyzing Possible Future Scenarios



Example of analyzing changing multi-hazard risk under climate change & land use change scenario, and for different risk reduction alternatives, for an urban area in Colombia.



Chapter 5: Preparedness

- Understanding disaster preparedness
- Disaster preparedness and evacuation
- Community-based preparedness planning
- Shelter planning
- Early Warning System (EWS)
- Establishing an EWS
- Examples of EWS for different types of hazard
- Impact-based forecasting
- Policy considerations



Impact-Based Forecasting



- An example of Impact-based forecasting (typhoon Kammuri approaching the Philippines) for the impact-based forecasting model was developed with support of the 510 data initiative of the Netherlands Red Cross.
- Based on the forecast, the Red Cross volunteers in the Philippines carried out several activities to reduce the impact of the typhoon, such as the strengthening of houses, securing vulnerable assets, early harvesting of crops, and evacuation of livestock from the areas where the impact was expected to be the highest.

https://www.forecast-based-financing.org/2019/12/02/typhoon-tisoy/



Chapter 6: Disaster Response

- Use of ICT for disaster response
- ICT for disaster alerting
- Post disaster response activities using satellite data
- Participatory mapping for disaster relief support
- Use of a mobile phone application for reporting a disaster incident
- ICT for disaster and safety communication network
- Applications of robots in Search and Rescue operations
- Use of ICT to responding to Covid-19
- Policy considerations



ICT for Disaster Alerting









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Example of the wealth of information for disaster responders on the GDACS, Here information is given for cyclone Amphan-20 that hit India and Bangladesh in 2020 (<u>https://www.gdacs.org/Cyclones/report.aspx?eventid=1000667&episodeid=18&eventtype=TC</u>)

GDACS (Global Disaster Alert and Coordination System):

- Cooperation framework between the United Nations, the European Commission and disaster managers worldwide to improve alerts, information exchange and coordination in the first phase after major sudden-onset disasters (https://www.gdacs.org/)
- GDACS continuously monitors or receives scientific data on natural hazards in order to run analytical models, related to hazards, exposure and losses directly after a disaster occurred.
- Currently GDACS alerts are issued for earthquakes and possible subsequent tsunamis, tropical cyclones, floods and volcanoes.

Chapter 7: Disaster Recovery

- Understanding disaster recovery and resilience
- Use of ICT for disaster recovery
- Post disaster building damage assessment using satellite data
- Post disaster recovery monitoring
- Policy considerations





Chapter 8: ICT, Gender & DRR

- Role of ICT in addressing issues related to Gender and DRR
- Mainstreaming gender into DRR
- Using ICT for empowering women
- Using ICT for gender sensitive DRR
- Policy considerations





Modes of Delivery

Online lecture series.

- Open online course, with recorded video lecture, guide, suggestions for online search, discussion forum
- Online workshop of 2.5 days / spread out over a period.
 Workshops
- 2.5 days duration
- Sessions of presentations, discussion and web-search



THANK YOU



