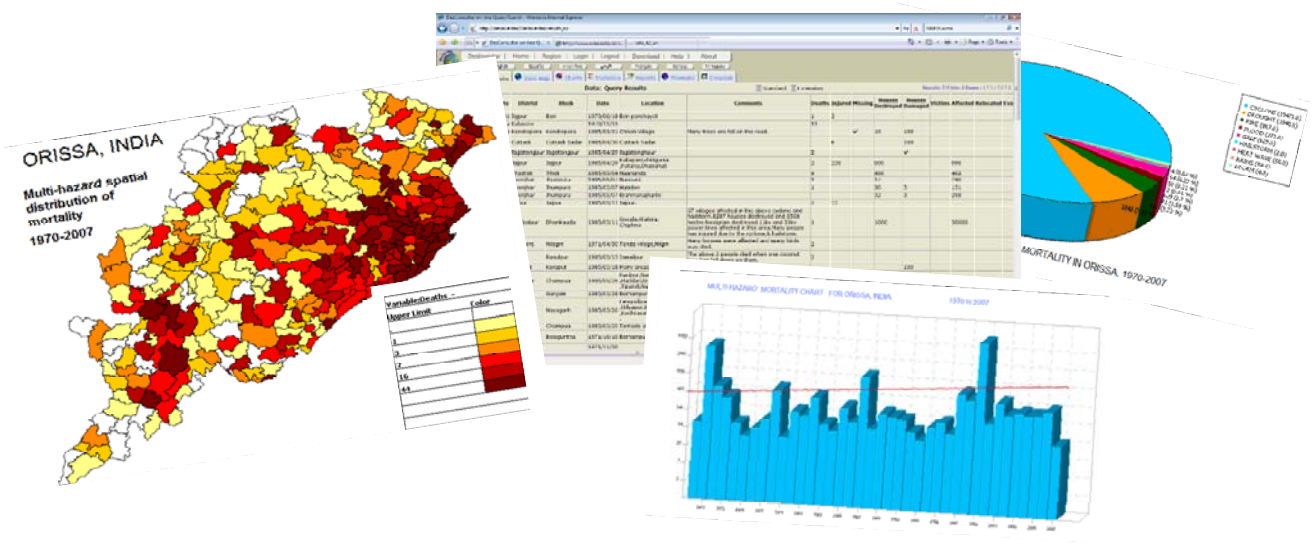
# Developing Disaster Loss Databases with Desinventar Sendai

*Day 2: Session 1: 14TH November 9:00 – 10:30*

# Disaster Loss Databases: a definition

- *A set of systematically collected records about disaster occurrence, damages, losses and impacts.*




Disasters always have **a temporal and a spatial footprint**. They can hit at different levels.

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# Types of disaster loss databases

| Approach | Disaster Information | Data Analysis | Outputs |
|---|---|---|---|
| Event-based | Disaster damage & loss | Statistic analysis | Disaster pattern and trend over time |
| System-based | Damage & loss + Context information | Spatial, sectoral, and thematic analysis; disaster mapping | Spatial distribution of damage and loss; spatial correlation among various components of a disaster system |
| Process-based | Damage & loss + Context information + Process information | Dynamic risk and disaster modeling and mapping | Chain of events; Cascading effects; systemic risk |

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# What is Desinventar?

## Methodology

- Disaggregating and geo-referencing of data.
- The collection and use of data about small and medium disasters
- Standardized disaster registration template

## Software-tool

- Open-source free tool
- Web-based version
- Data analysis support facilitated by the integrated DesInventar software package ( analytical module DesConsultar)

It enables the inventory of high resolution level with the usage of record cards.

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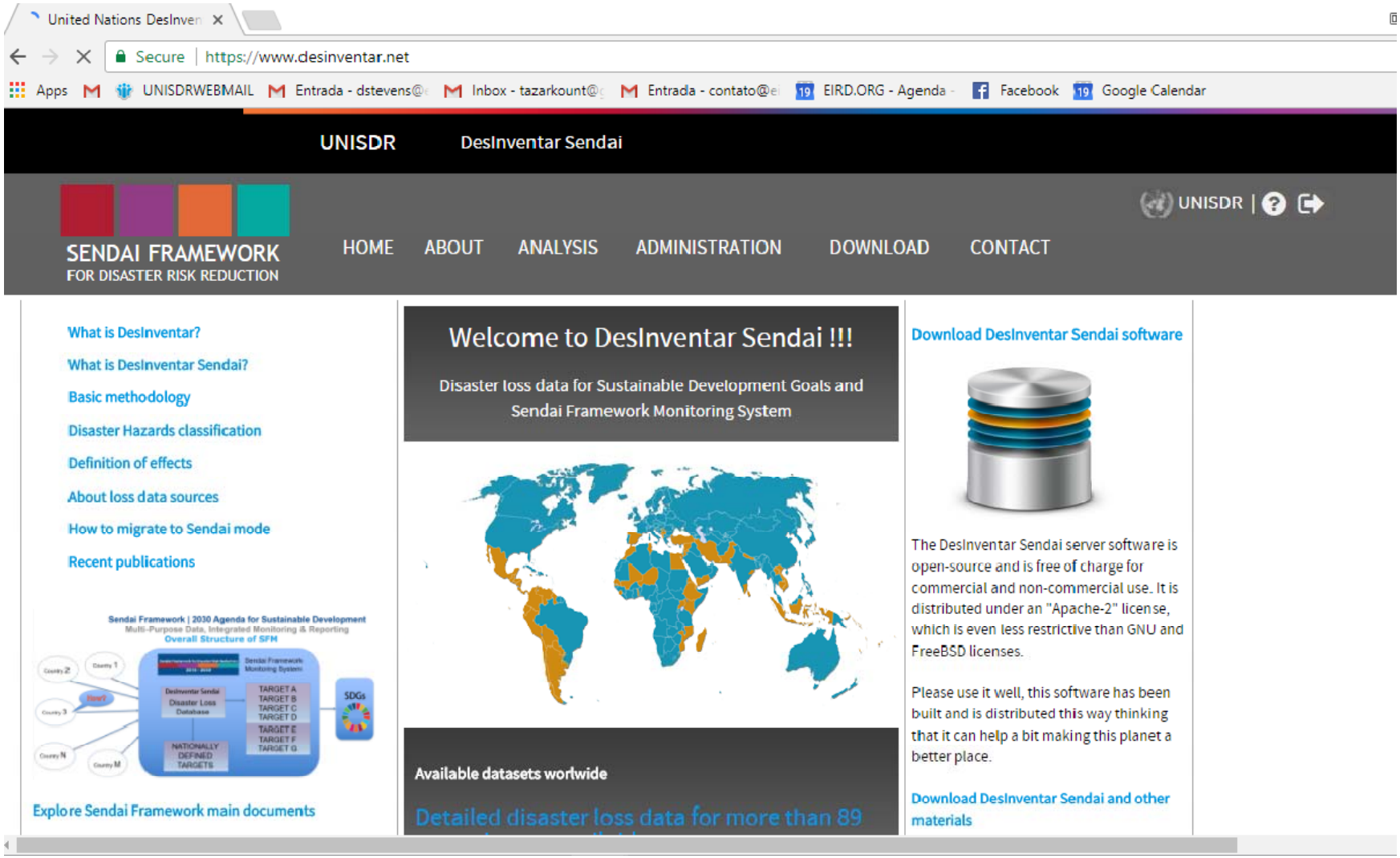
# Desinventar.net

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# Origins of Desinventar

- *Project DesInventar, "Inventory of Disasters in Latin America" started in late 1993*


- ***Desinventar** was set up in 1994 by the Network of Social Studies in the Prevention of Disasters in Latin America (LA RED) and maintained and updated by Corporation Observatorio Sismologico del Sur Occidente (OSSO)*
- ***Started as project, researchers wanted to better understand:***
  - *Disaster- Development Nexus*
  - *Impact of small and mid-scale disasters and how they reveal vulnerabilities*
  - *Trends and patterns*

.

des inventar
Disaster Information Management System

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# Desinventar Methodology

- *Standardized data collection and registration*
- *Data fields recorded cover human loss, physical damage and economic loss.*
- ***No thresholds** for disaster registration: allow for inclusion of all events that may have had any effect on life, properties or infrastructure, with no limit in size.*

- *The system can accommodate **additional** categories of hazards, data fields of impact indicators, and causes according to local conditions and needs **( extensions)***

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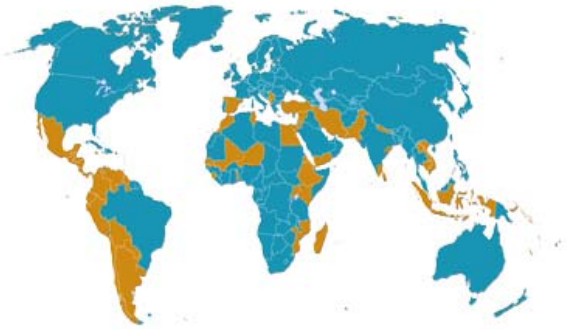
# DesInventar Sendai: new software version

- *A historical disaster loss database.*
- *A tool for collecting disaster loss data.*
- *A tool for Reporting on Sendai Framework and the SDG's*
- *Contains a set of tools for analysing the data, such as:*
  - *Impacts by hazard*
  - *-Temporal analysis*
  - *-Spatial analysis*
  - *-Cause-effect analysis*
  - *-Statistical analysis (mean, standard deviation, etc.)*
- *But more importantly, DesInventar proposes **a methodology** that allows to develop analysis in a comparative way between the countries that have joined the initiative.*



des inventar
Disaster Information Management System

# IRDR Hazard classification

The **Disaster Loss Data (DATA**) project, under the umbrella of the Integrated Research on Disaster Risk (IRDR)

# Exercise: compare definitions and classifications

- *For SAARC countries' representatives:*
  - Which hazard classification do you follow?
  - How close it is your classification to the one standard to Desinventar ( IRDR)?
  - Which are the differences? Why do you think customization was required?
- *For INDIA states and India central government representatives?*
  - How are the classifications adopted by MHA and IRDR one different?
  - Which type of additional hazards and perils will the States needs to introduce?

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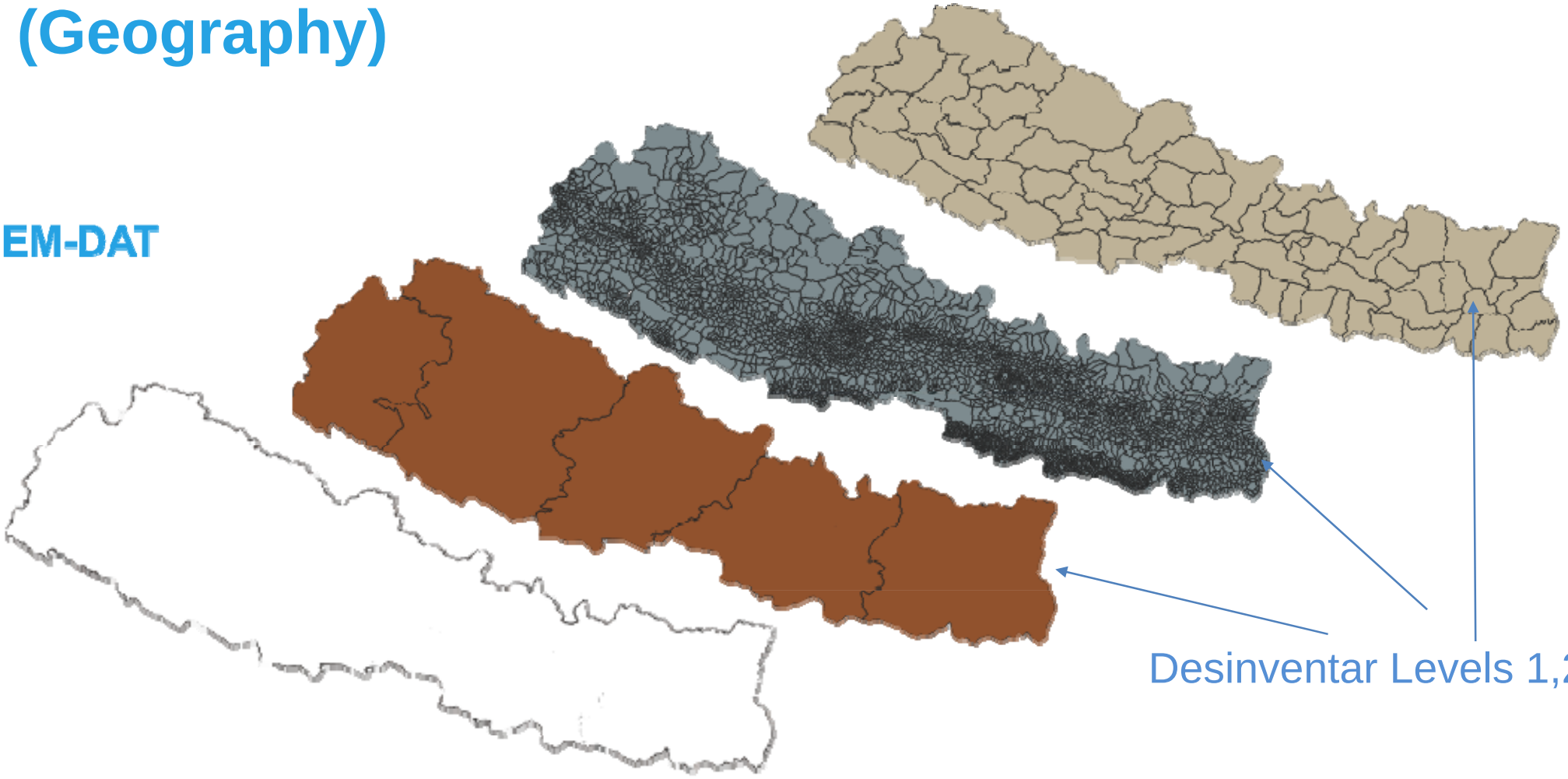
# Relevance of Disaggregation
## (Geography)

EM-DAT

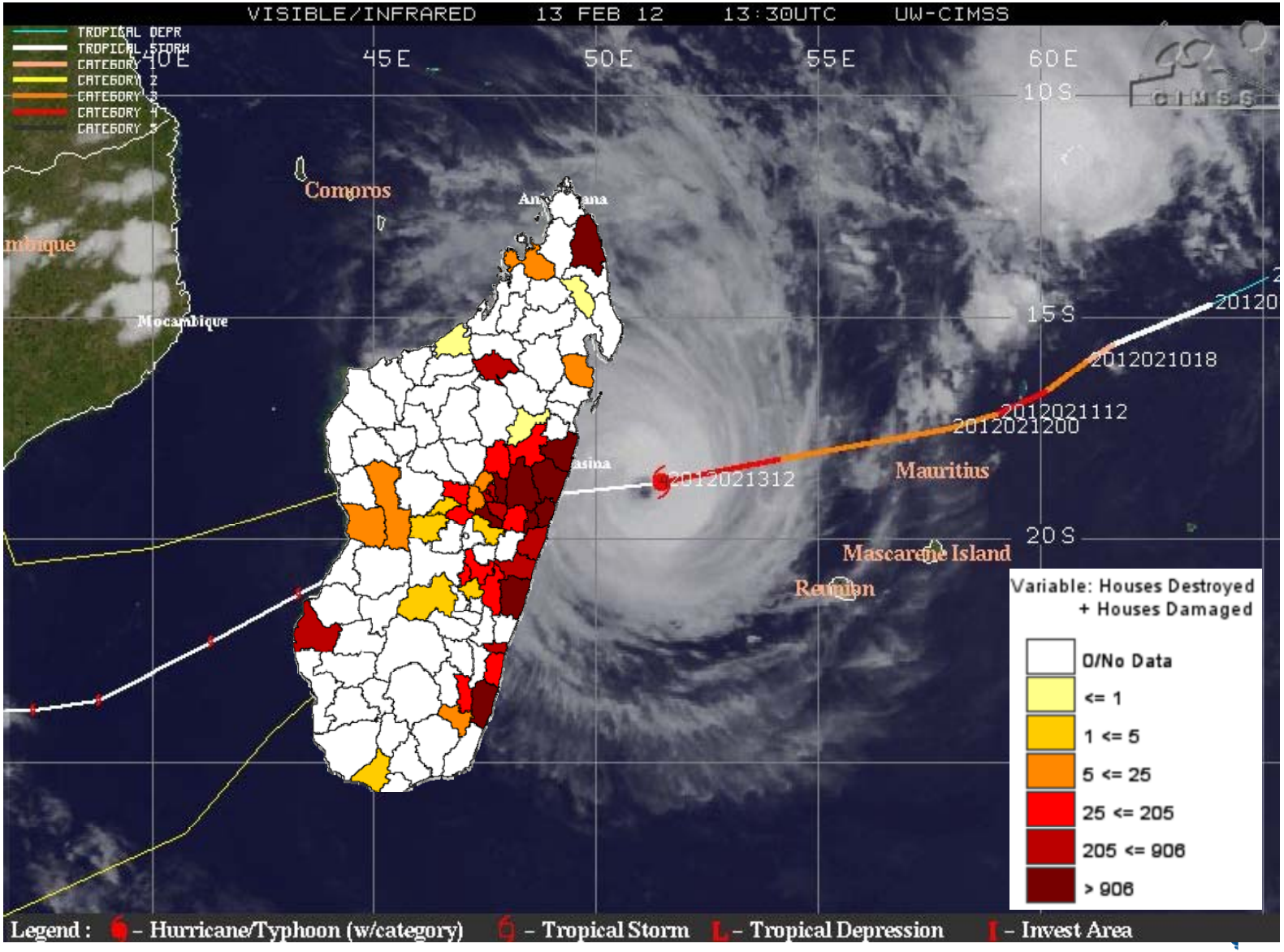


Desinventar Levels 1,2,3

*The **geographical disaggregation** of disaster data will allow to visualize the impact of hazards at local level. This will enable to take action in critical spots and to prioritize activities based on the financial and human resources available.*

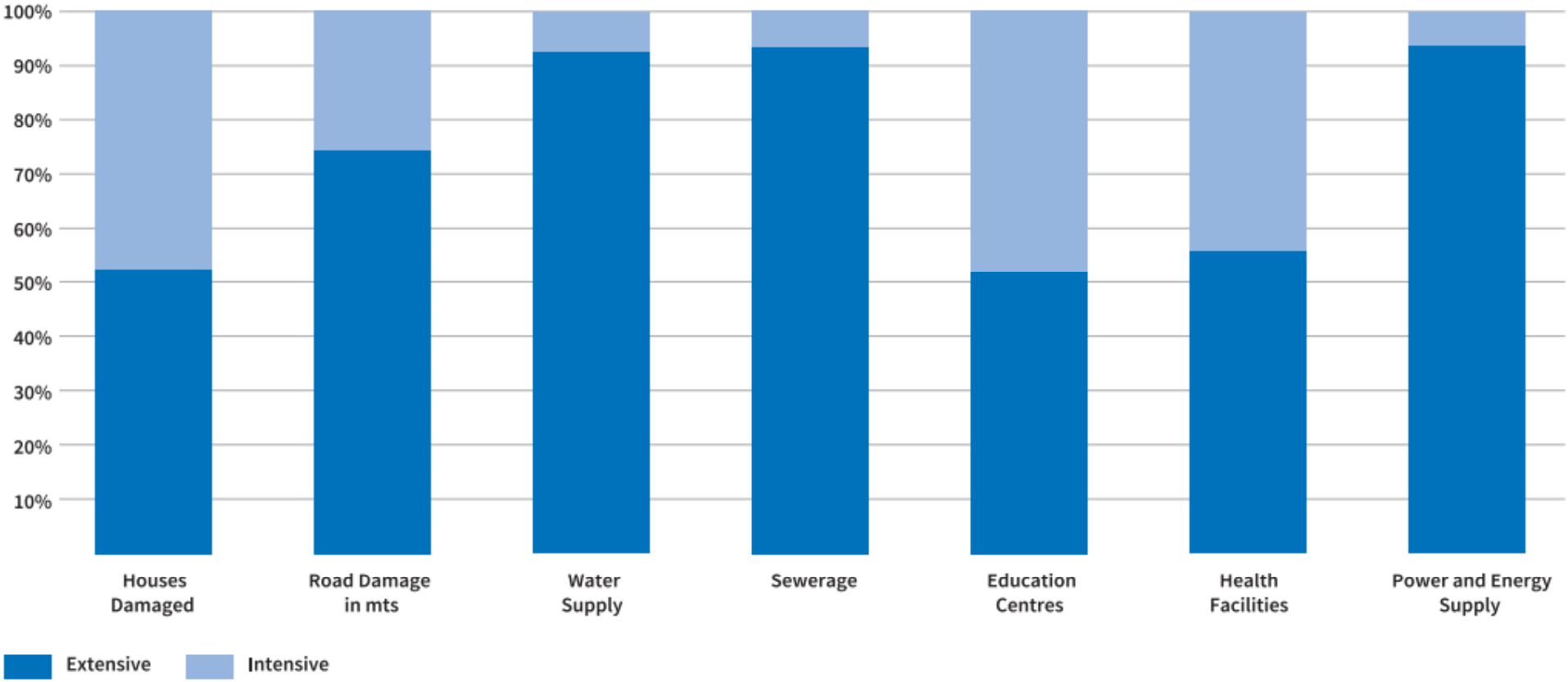
# Disaggregation (geography)

- *Impact in houses of cyclone Giovanna in Madagascar (2012)*



# Extensive and Intensive disasters

- The impact of extensive disasters

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# Criteria for loss accounting

**Recommendations**

- *Disaggregate to an optimal scale and the administrative boundaries*
- *Select specific names and codes for each administrative level*
- *Search for data for the longest possible period of time (30 years?)*
- *Select, rate and prioritize data sources*

**What to do if…**

- *Disaggregated data is not available?*
- *There are differences between the sources regarding the same event?*
- *If an event is followed by another event?*
- *If an event hits different geographical units?*
- *Slow-onset events?*

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# Approaches to work with Desinventar

## Work online

Desinventar.net ( regions to be created by UNISDR and access granted to administrator in the country)

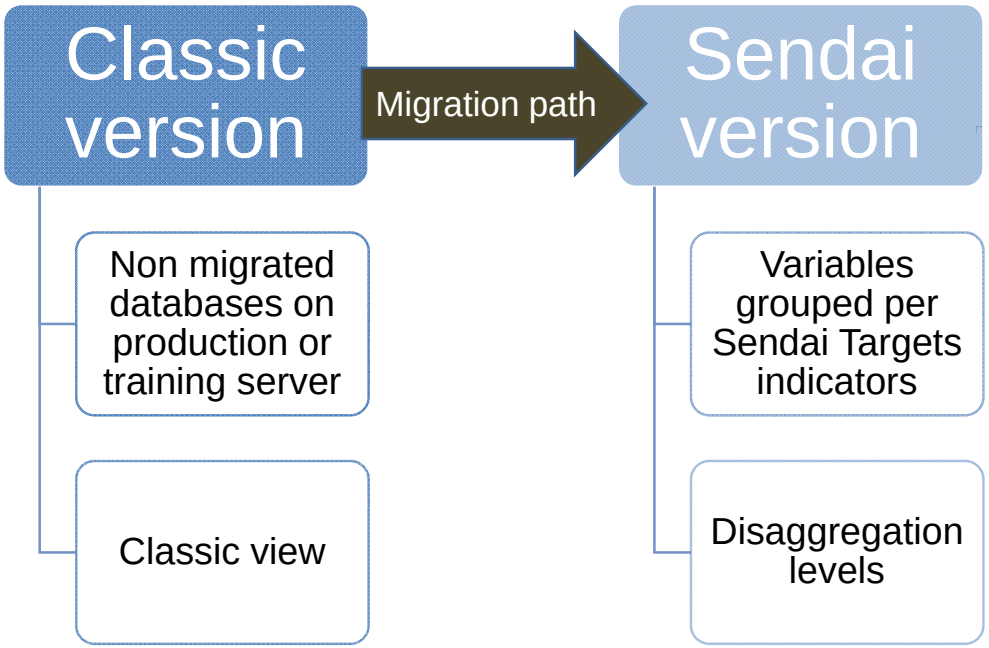
Training.desinventar.org for practicing purposes

## Install the software

Download from website and install ( available on pen drive for this training)

Install in your local server and publish online

Work on your laptop: Local host

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# What is needed to record disaster losses?

## 4 things need to be taken into account when recording disaster losses:

*Disasters have to be treated as events*

**PLACE**

- Where disaster took place

**DATE**

- When the disaster took place

**HAZARD**

- Which type of hazard triggered the disaster

**EFFECTS**

- Which where the impacts damages and losses

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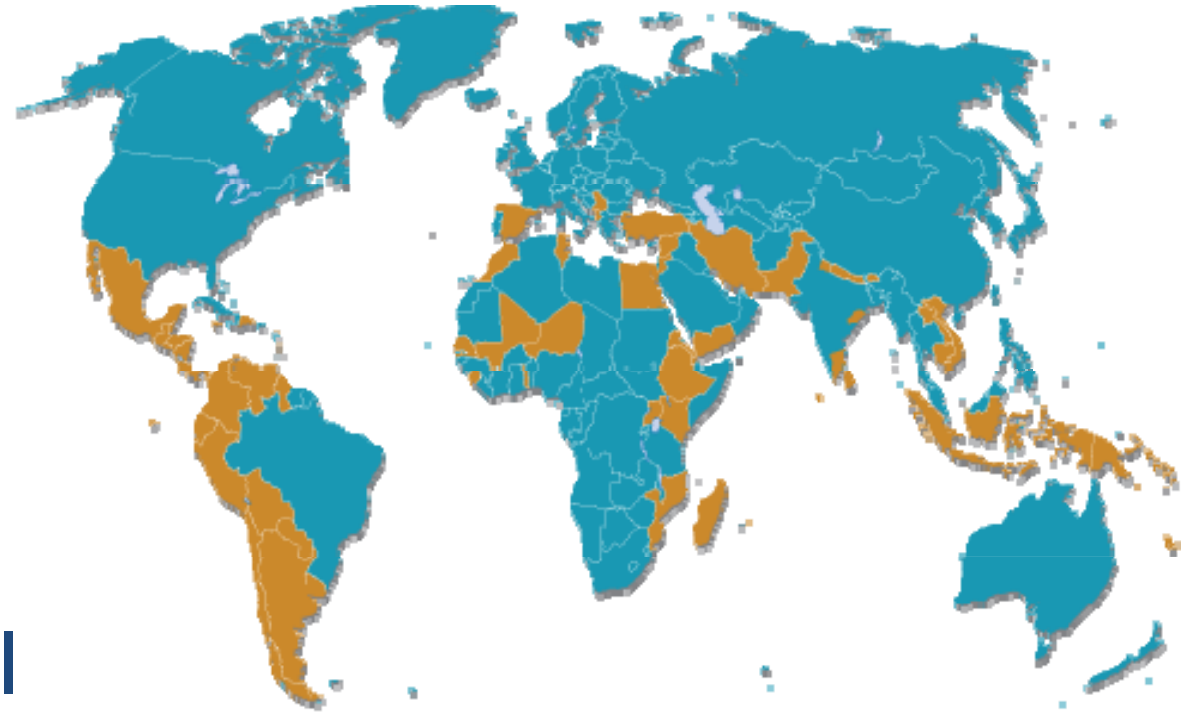
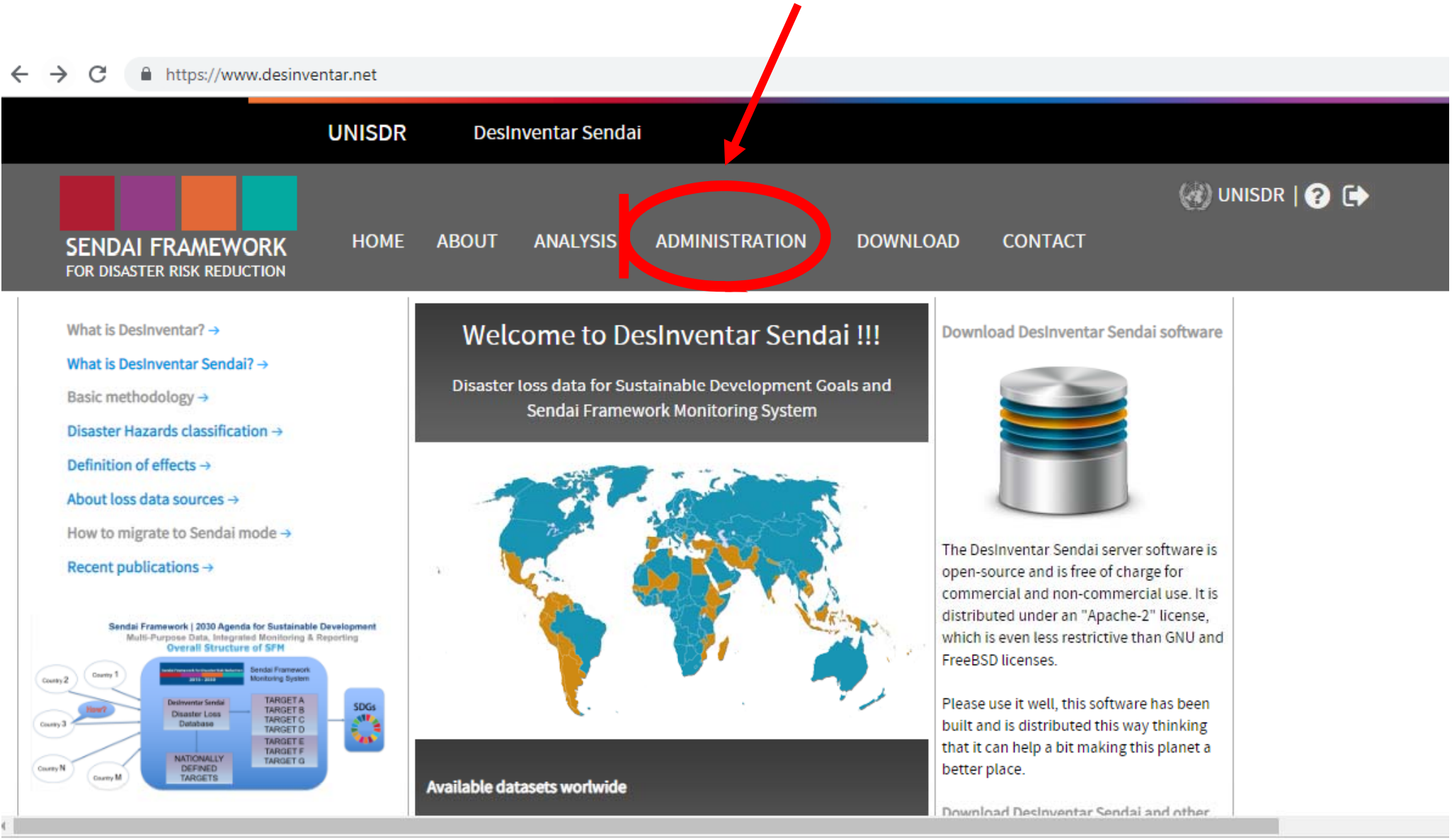
# training.desinventar.net



Login: GETI

Password: Sendai2015

# Administrator Module

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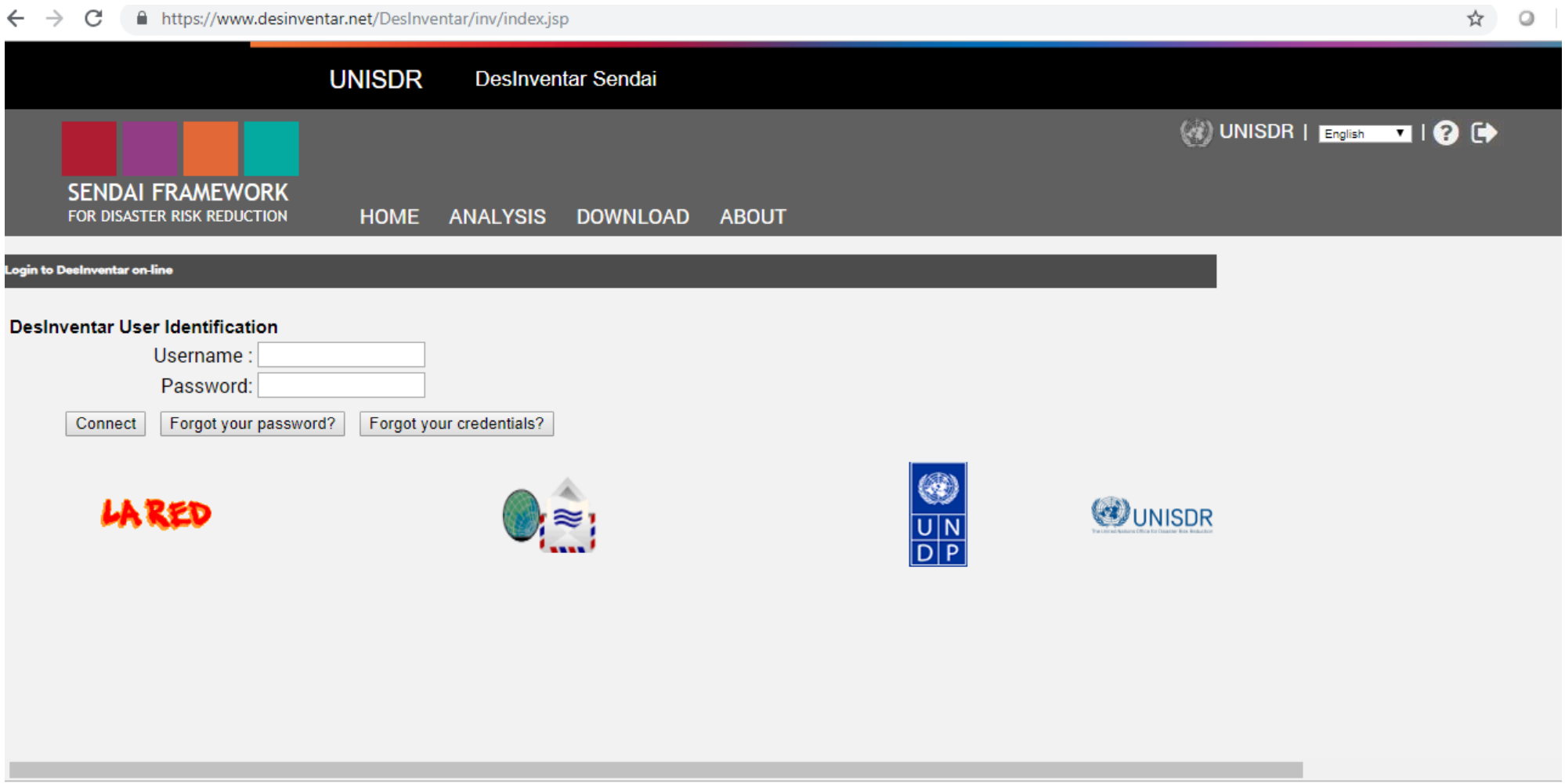
# Administrator access is password protected.

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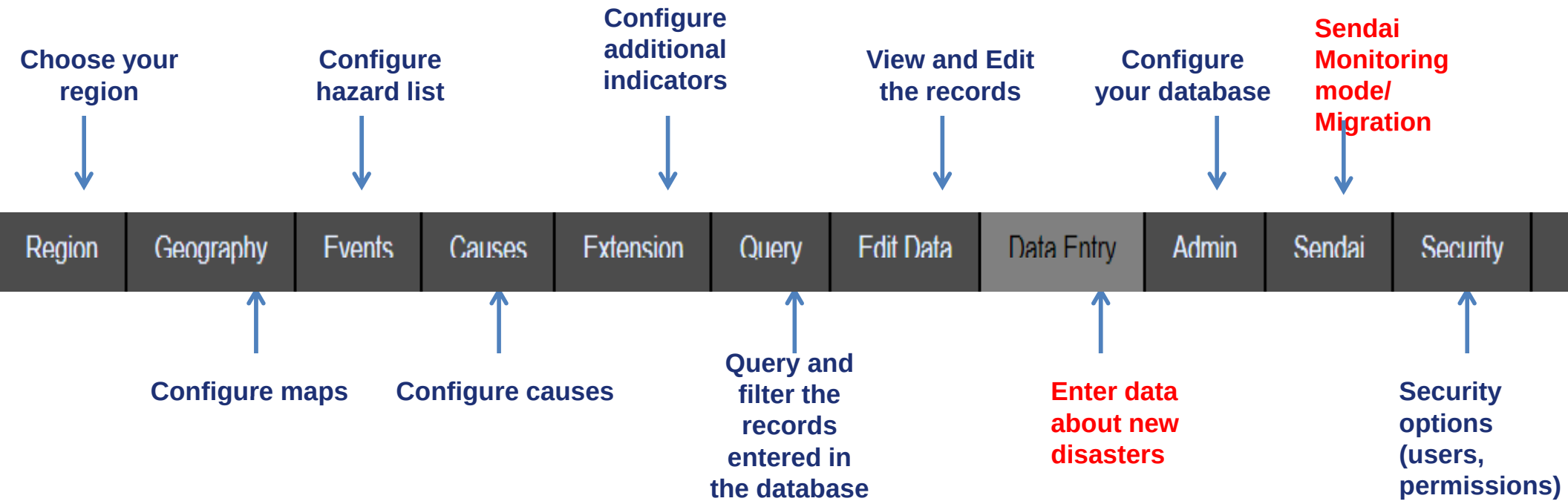
# The Administration Module




The **Administration and Data Entry module** is the interface through which the relational database is fed. Filling the database is done through data registration in predefined fields (space and temporal data, types of events and causes, sources) and by both direct and indirect effects (deaths, houses, infrastructure, economic sectors).

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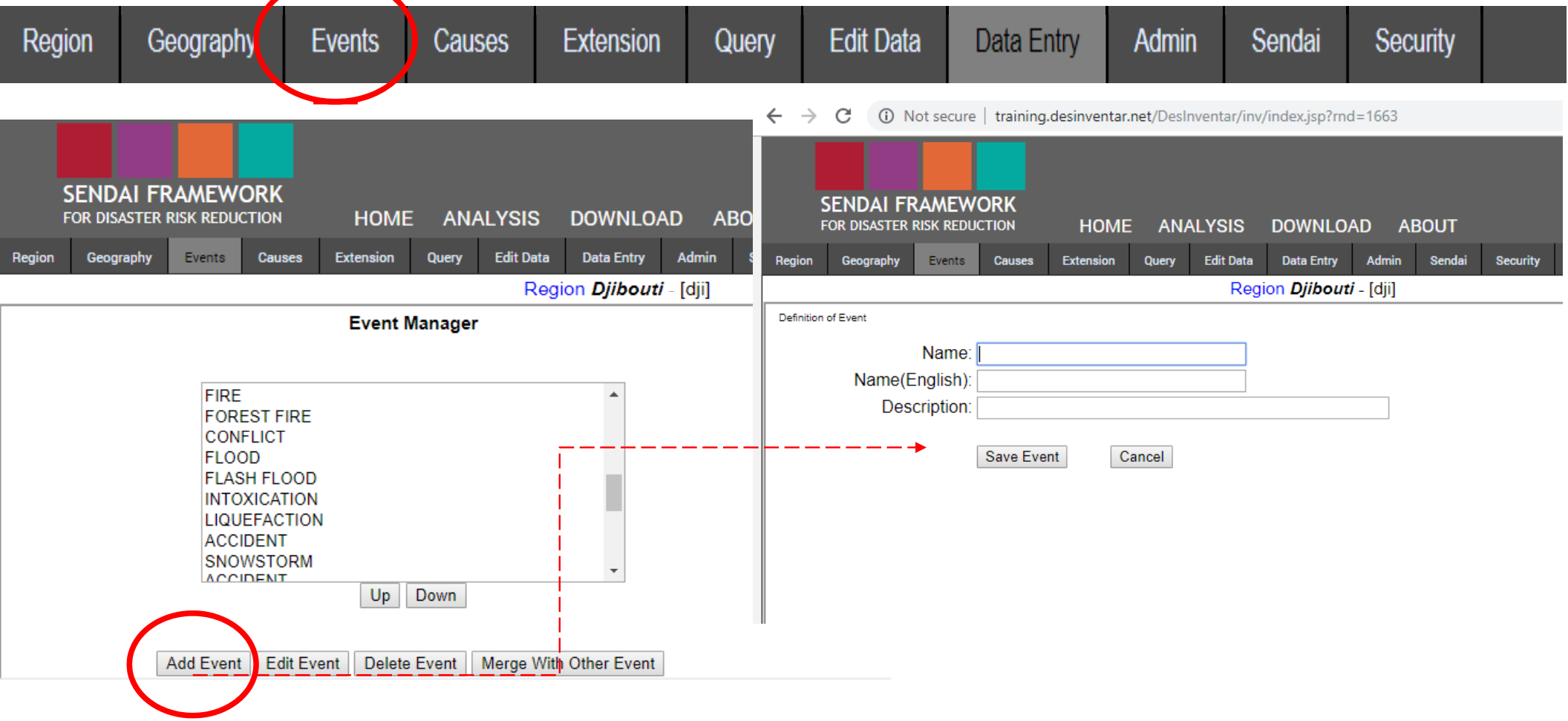
# Configurations

*Hazard list ( under Event tab)*

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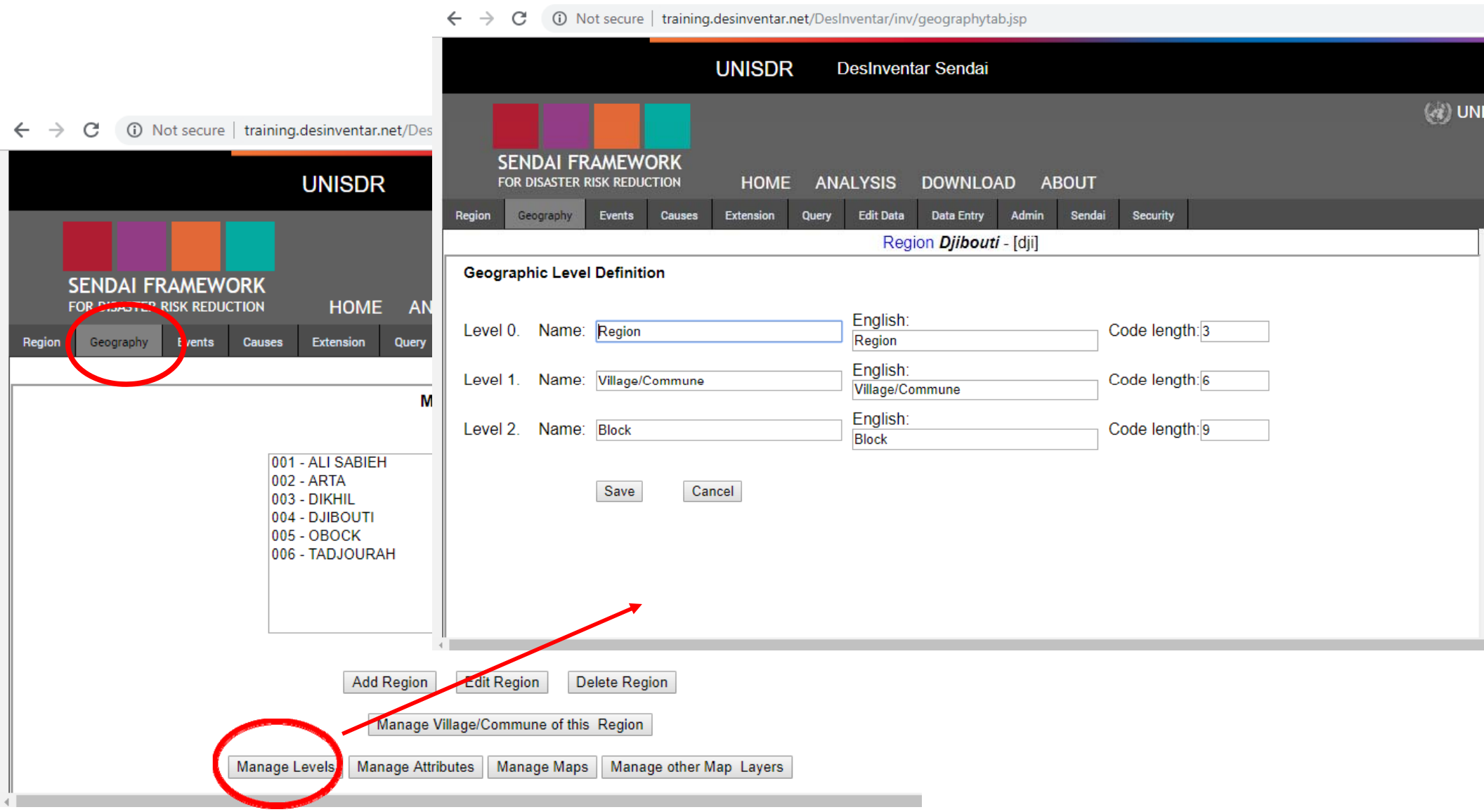
# Geography management

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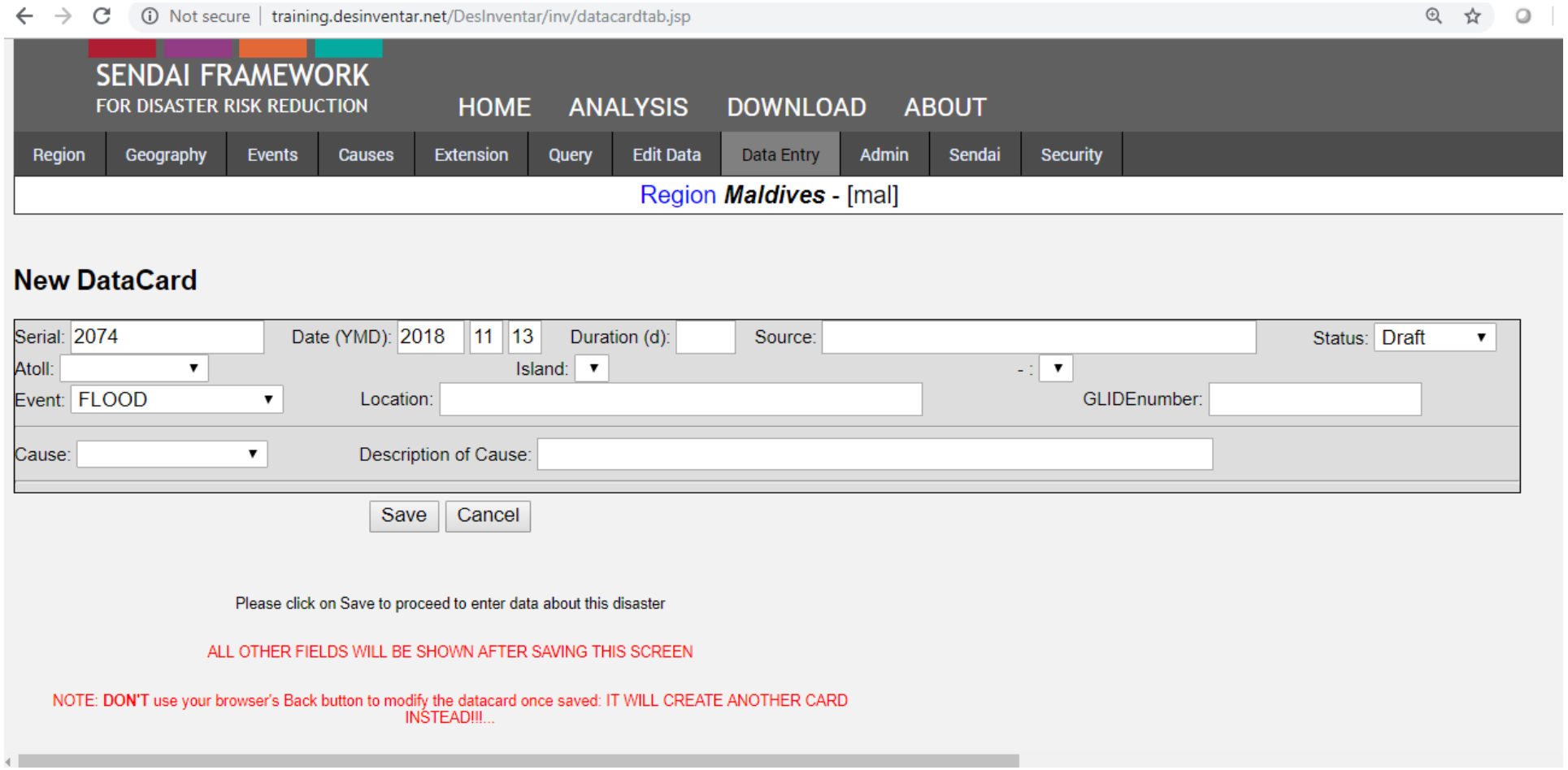
# Data Entry: new Data Card

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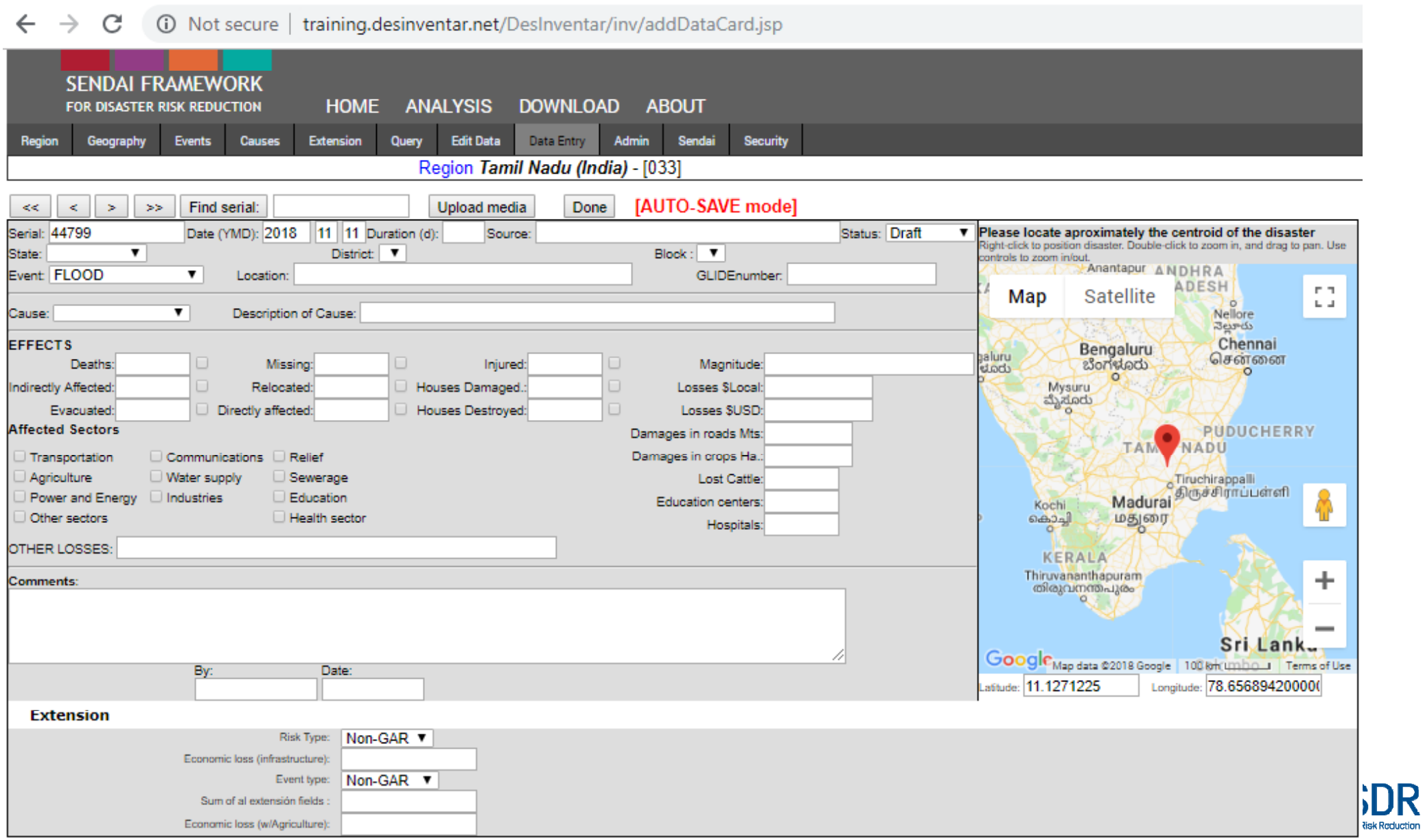
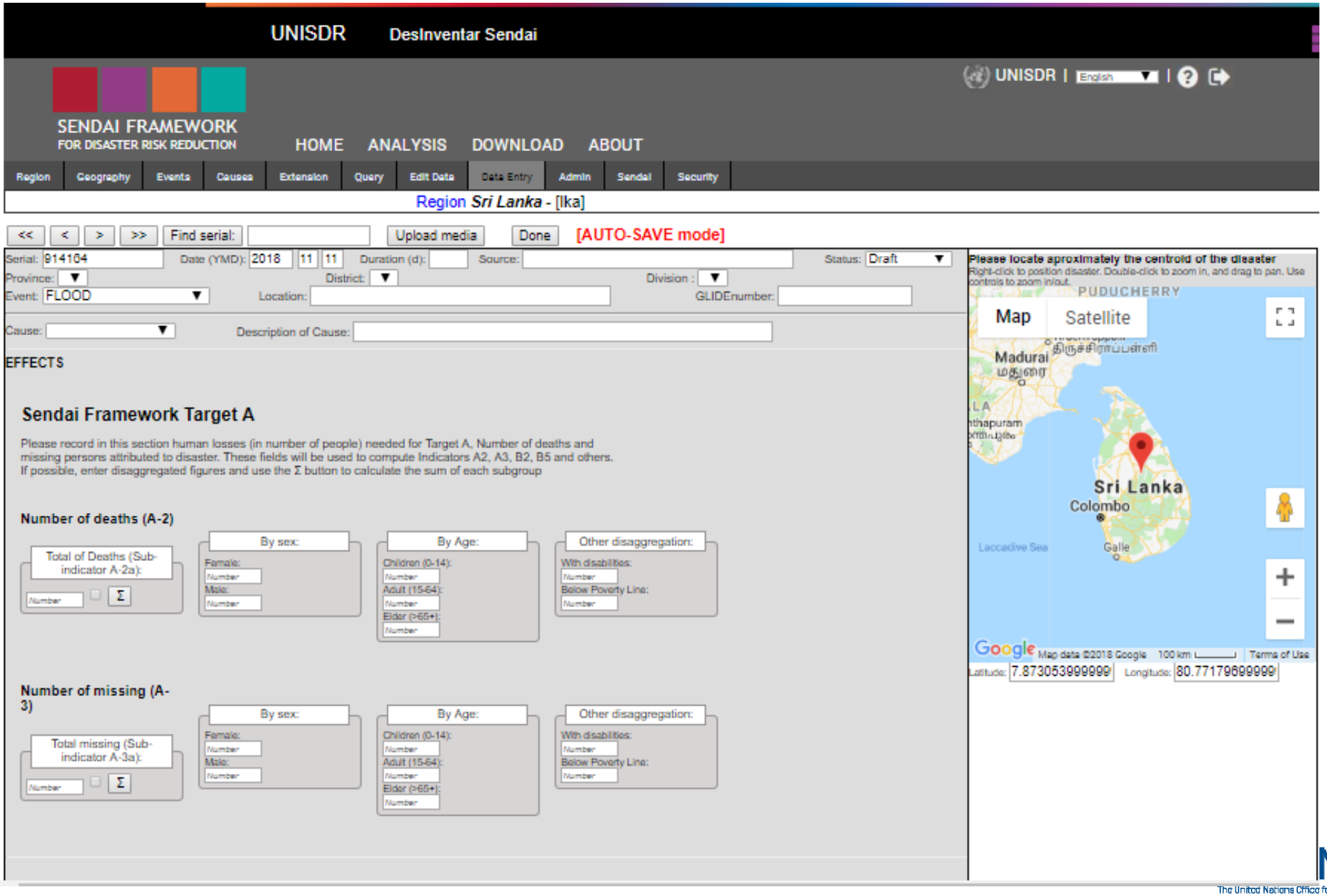
# The Datacard – Entering an event ‘Classic Mode’



# The Datacard – Entering an event

# ‘Desinventar Sendai - SDG Mode’

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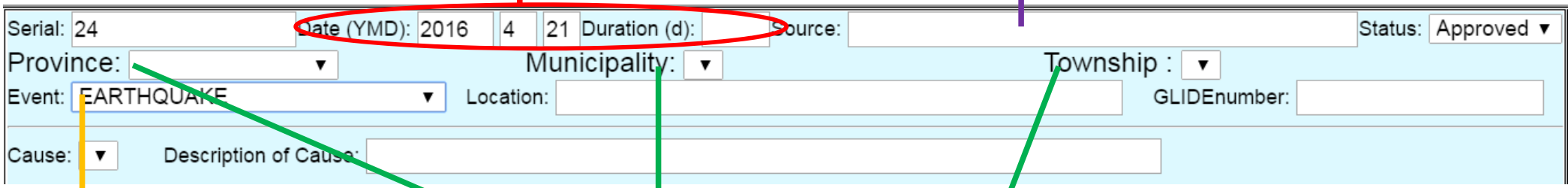
# Exercise 1

- *Entering a disaster event on the datacard*

Disasters have a **temporal** and a **spatial** footprint

**When did the disaster happen?**
**YYYY-MM-DD** *Start date*

**Who provided the information?**




**Dropdown menu: Which type of hazard event?**

**Dropdown menus: Where did the event took place?**

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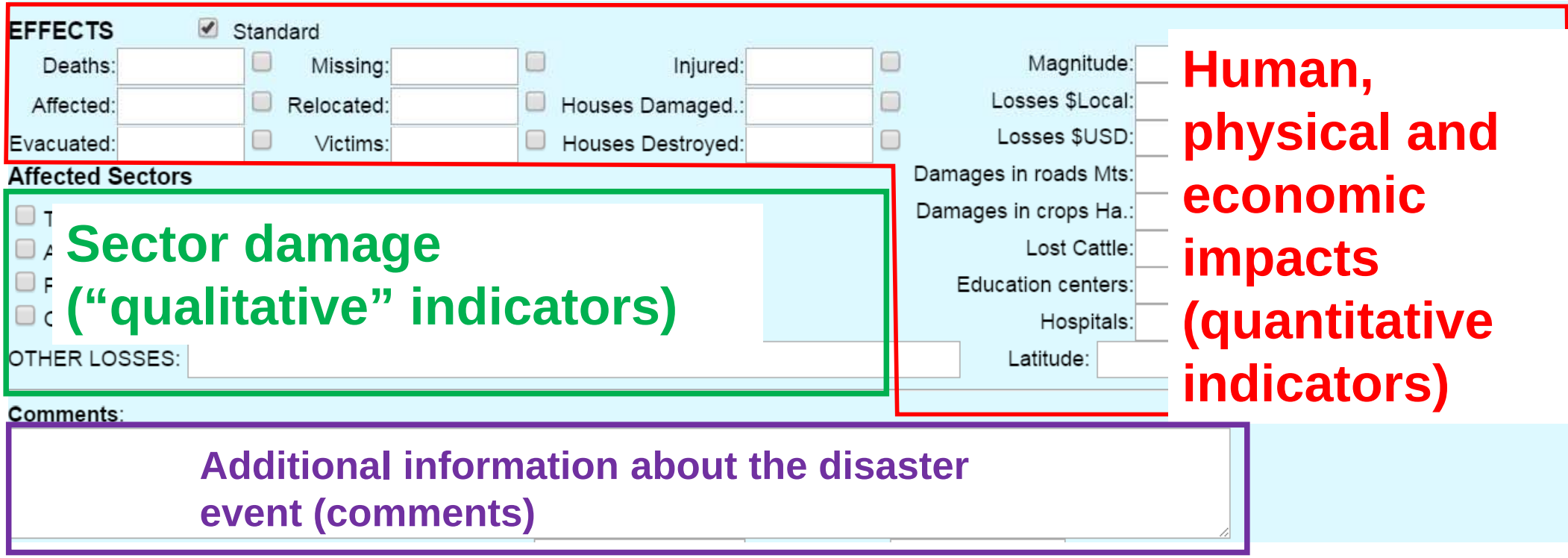
# Exercise 1

- *Entering a disaster event on the datacard*

Disasters have different **human and physical impacts** that are measured through **damage and loss indicators**

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# Exercise 1: Entering a disaster on the datacard ( classic Mode)

The Orisa State Disaster Management  Agency reported that the 14 July 2018 a flood hit the Sambalpur district and 2 ( Jojomura and Bamra ) out of the 9 blocks were affected

After two days of intense raining, official numbers about the impacts were published:

- 3 people were reported killed and 2 are missing,
- 24 people were injured and 900 were evacuated. 325 children were hosted in shelters.
- Some 45 houses were completely washed away and 69 were damaged, affecting 405 people.
- As part of the disaster relief operations, special efforts have been put in place for repairing the sewerage system that also suffered important damages.
- The State is requesting resources for food, given that more than 9,500 hectares of crops (mainly rice) have been destroyed.

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# Reflections from the exercise

- *Geographic disaggregation*
- *Missing information*
- *Impact information disaggregation*
- *Definitions ( directly affected)*

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# Exercise 2: Entering a disaster on the datacard ( Sendai Mode)

*The Laos Disaster Management Agency reported that the 14 July 2018 a flood hit the province of Vientiane specifically the Kasi district*

*After two days of intensive flooding, official numbers about the impacts were published:*

- *3 people were reported killed and 2 are missing,*
- *24 people were injured and 900 were evacuated. 325 children were hosted in shelters.*
- *Some 45 houses were completely washed away and 69 were damaged, affecting 405 people.*
- *As part of the disaster relief operations, special efforts have been put in place for repairing the sewerage system that also suffered important damages.*
- *The province government is requesting resources for food, given that more than 9,500 hectares of crops (mainly rice) have been destroyed.*

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# Key difference of working on Desinventar Sendai

- *Please share how your experience in data recording has been different.*
- *What are the challenges of disaggregation?*

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# Exercise 4

## ➢ Managing Sendai Disaggregation

Disaggregations are **additional damage and loss indicators** that can are automatically added to the record:

**Damages and losses in Agriculture (C-2)**

**Agricultural Crop Loss (C-2C)**

Economic Loss and Physical Damage to Crops (C-2Ca):

| Economic loss from crops affected: | Total Hectares of crops affected: | | Hectares damaged: | Hectares destroyed: |
|---|---|---|---|---|
| Number | Number | Σ | Number | Number |

Disaggregation:

| | Economic loss: | Total Affected (Area) [Ha]: | | Damaged (Area) [Ha]: | Destroyed (Area) [Ha]: |
|---|---|---|---|---|---|
| Wheat | Number | Number | Σ | Number | Number |
| Barley | Number | Number | Σ | Number | Number |
| Vegetables, leguminous nes | Number | Number | Σ | Number | Number |

# Exercise 3

- ***Dealing with conflicts in the sources***

A strong hailstorm hit Laos the 24th November 2015. The district of Vapi on Saravane province was the most affected, data from the Red Cross suggests: 6 people were killed and 450 were affected; power supply was damaged, and some 12 houses were destroyed, obliging the relocation of 47 people.

The figures reported by the Red Cross about the casualties in Vapi differ from the official numbers released by the National Disaster Management Agency in its latest report, where 3 people were reported killed and 2 are missing, while the disaster relief operations resume.

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# Decisions, implication and documentation

- *Sources, verification, credibility and approach when conflicting information exists ( What is the authorative information?)*
- *Time for registering data*

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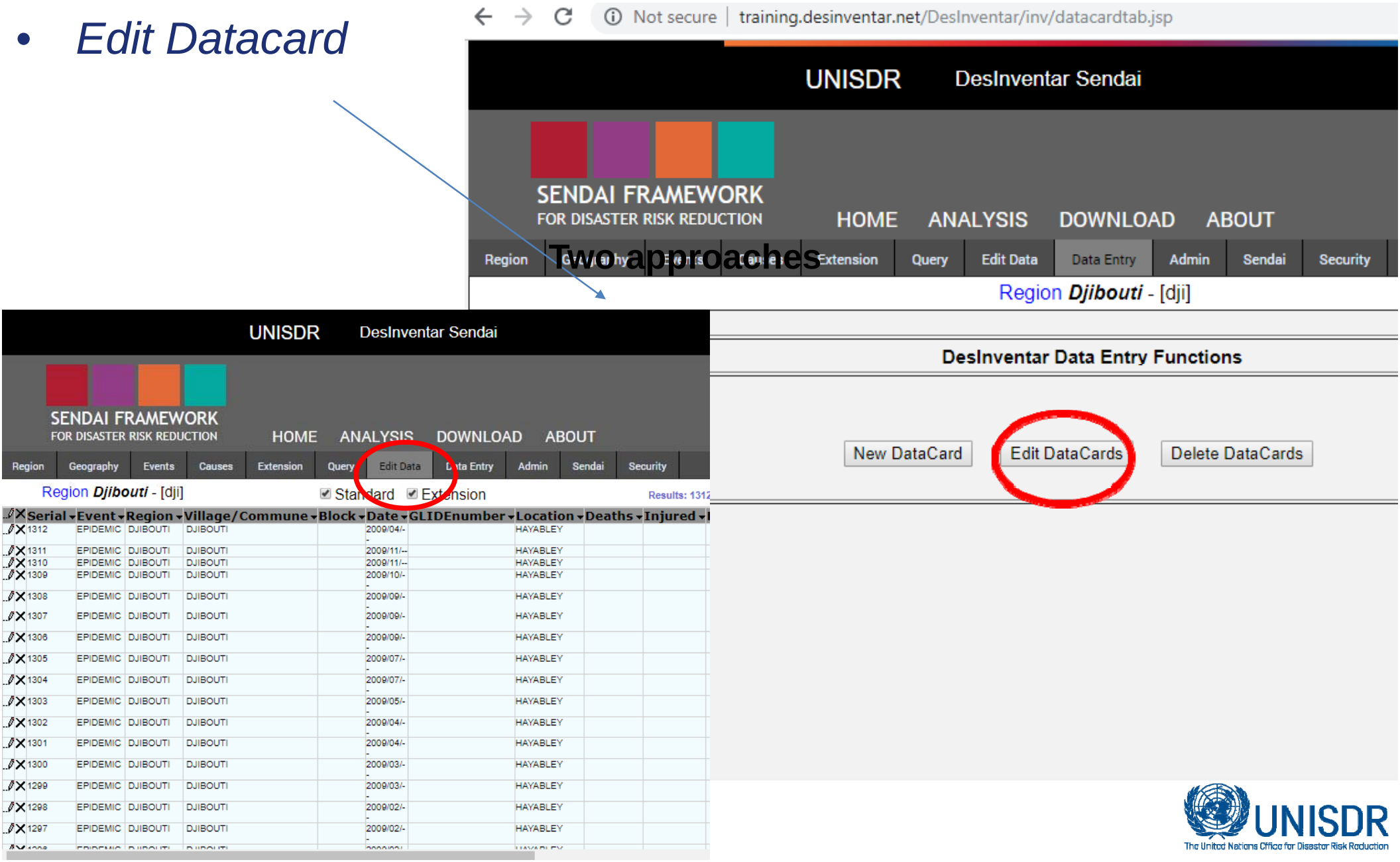
# Editing an existing datacard

- *Edit Datacard*

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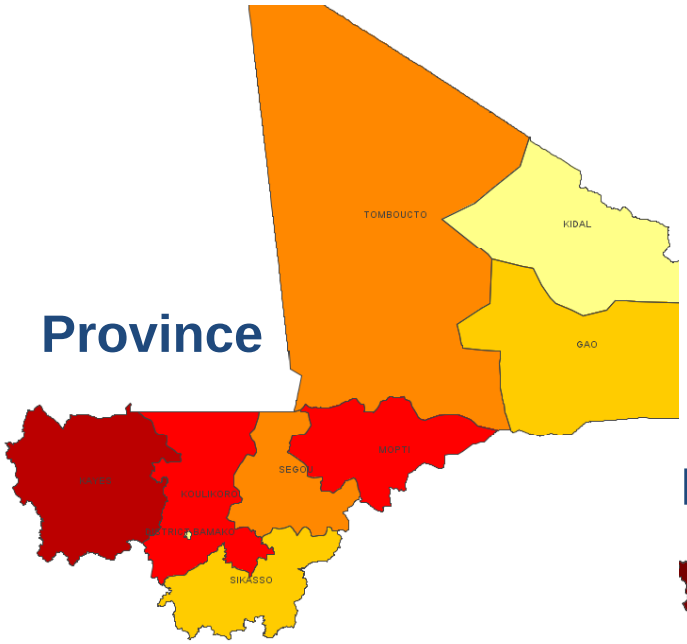
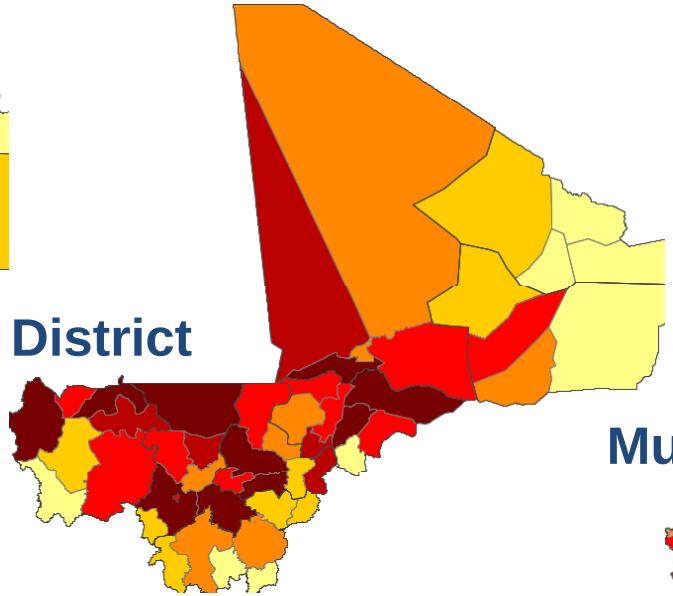
# Exercise 4

- ***Geographic disaggregation of the data***

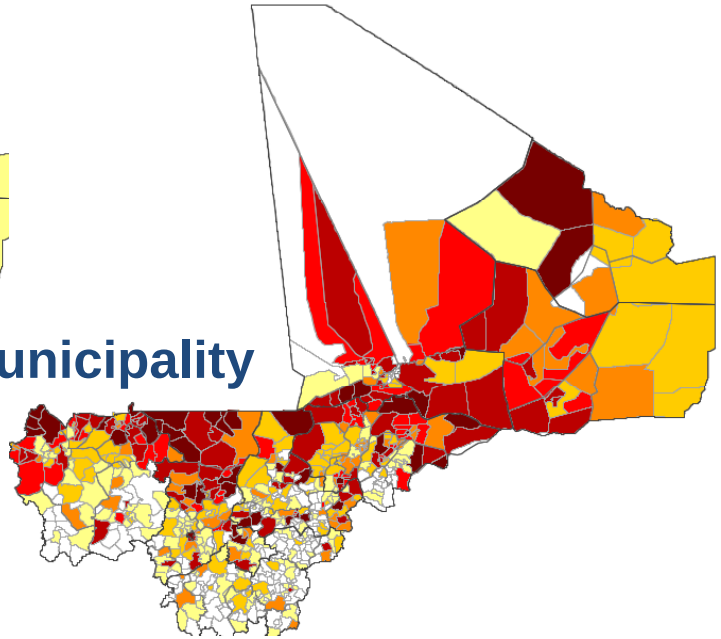
Disasters have a **temporal** and a **spatial** footprint




**Province**



**District**



**Municipality**

**Information should be entered at the lowest geographical level possible**

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# Exercise 4

- ***Geographic disaggregation of the data***

Intense floods affected the province of Bokeo ( Laos) between January 8 and 11 2016. The Laos National Disaster Management Agency released official numbers about the impacts. Paktha, the most affected district of the province, accounted for 23 people killed, 54 houses destroyed, 28 houses damaged and 300 m. of roads destroyed. Followed by Meung, where 9 people lost their lives, and 26 houses were destroyed. While no people was killed in the municipality of Pha-Oudom, important damages to housing and local infrastructure were registered: 12 houses destroyed and 34 damaged; water supply was interrupted, affecting some 50 households.

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# Exercise 5

- **Managing the extensions (Classic mode)**

Extensions are **additional damage and loss indicators** that can be **customized** and **organized in tabs**.


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# Exercise 5

## ➢ Managing the extensions

**Nepal, Central Region, April 22, 2016**. A 6.8 magnitude earthquake hit the district of Dolakha, destroying 9 houses and damaging more than 70, reports from the NDMA reported. 15 people lost their lives and 7 are reported missing. Sector damage and loss assessments were made:

- 2 clinics were destroyed and 1 hospital damaged.
- One primary school was damaged
- 4 pipelines have been destroyed

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# Exercise 6

- **Managing the extensions**

A landslide hit the capital Katmandu (central region) last 26th April 2016, destroying a total of 17 buildings and damaging other 25. Two primary schools were damaged, injuring four children and killing 1, due to the collapse of a column. So far, it is the only casualty that has been confirmed.

The local clinic was also destroyed. Water supply to the population is restricted. Some 120 people were evacuated. The local temple was closed for security, as the structure also suffered damage and could collapse.

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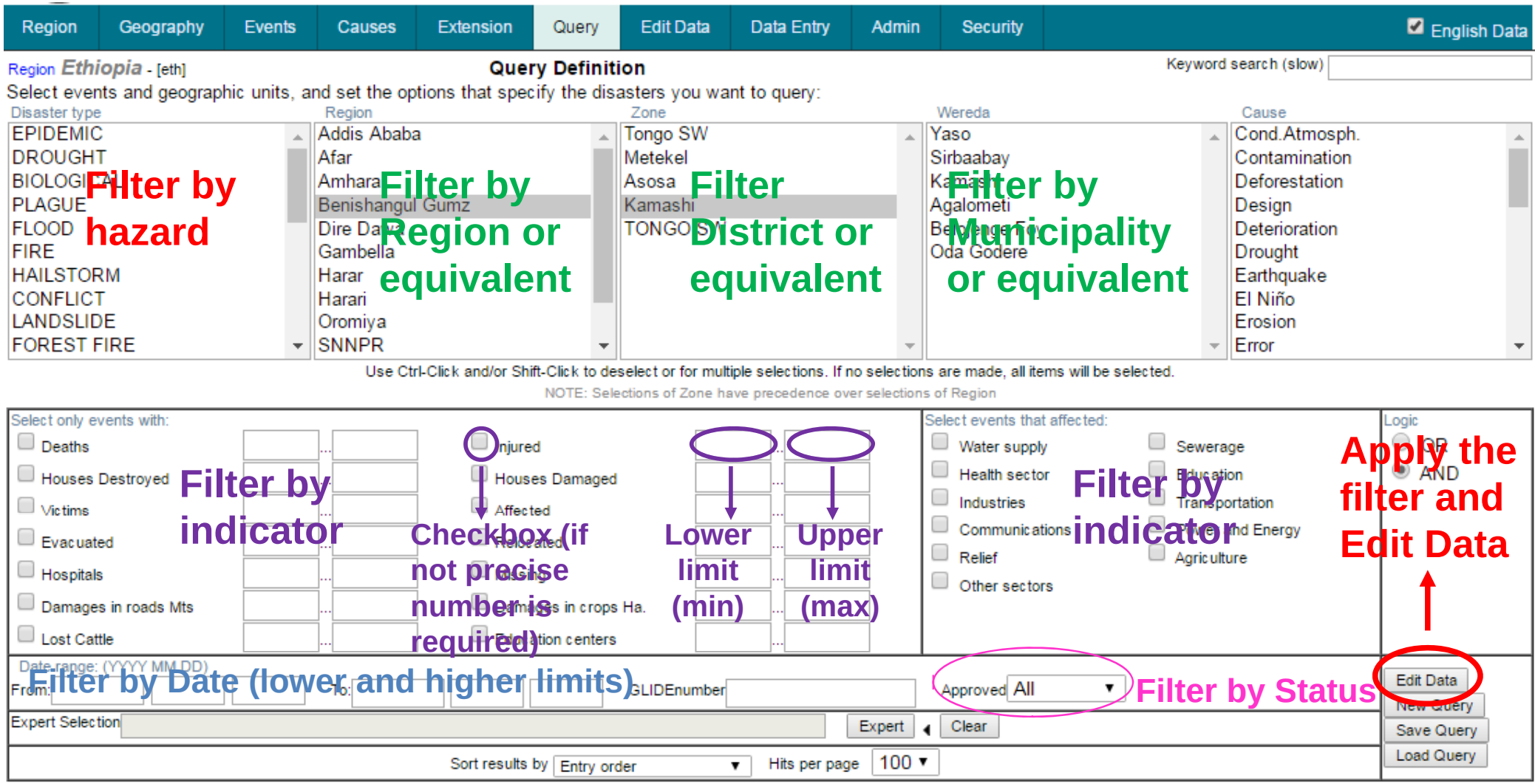
# Exercise 7

- **Query: filtering the information for data revision/validation**



# Exercise 7

- **Query**: **filtering the information for data revision/validation**

**The more  criteria you ask, the less data you get!**

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# Exercise 7

- **Query**: **filtering the information for data revision/validation**

**Proposed database: Laos ( training.server)**

- Filter only the datacards about floods: How many records you obtain?
- Filter all datacards since 1st of April 2016: How many records you obtain?
- Filter only the datacards that have registered houses damaged: How many records you obtain?

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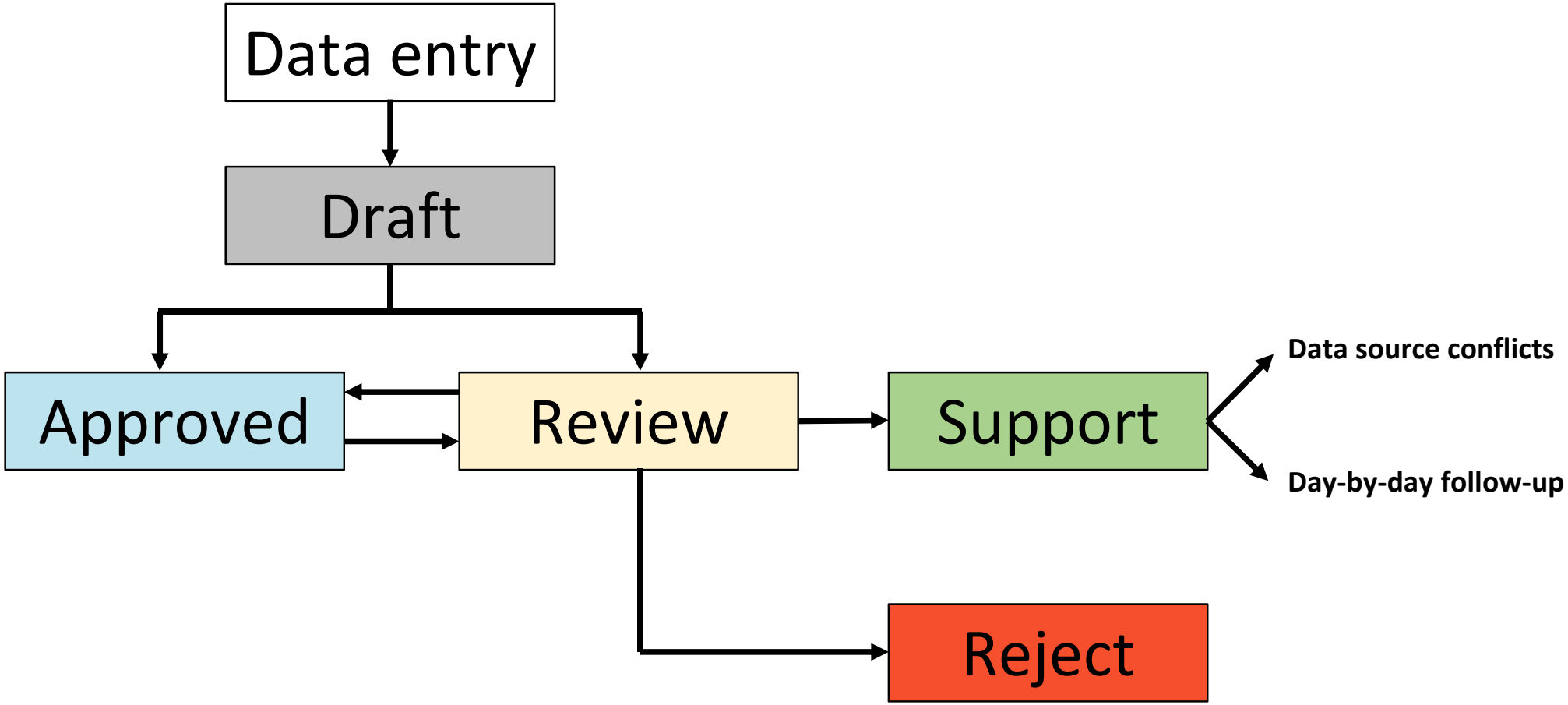
# Workflow

- **Using the "Status" drop-down menu helps to facilitate the workflow of data entry and validation.**

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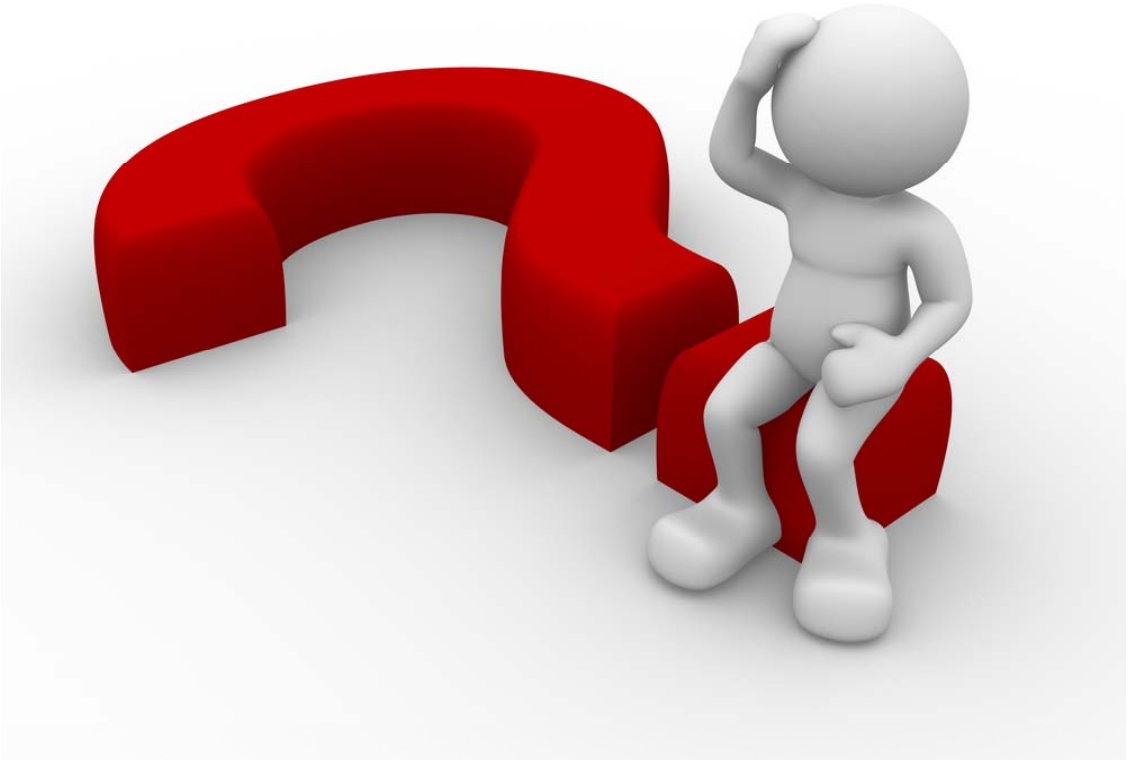

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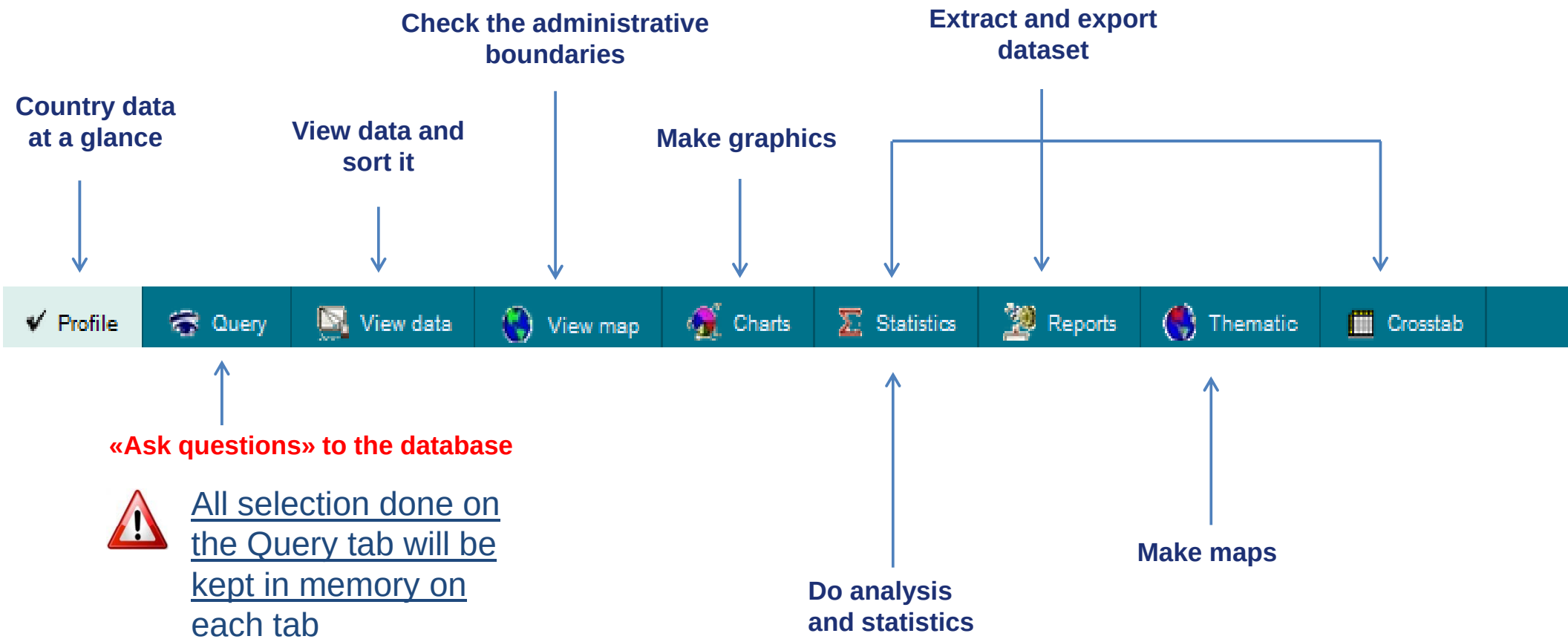
# DesInventar hands-on training (Analytics – DesConsultar)

# Analysis Module

## Tool main menu presentation

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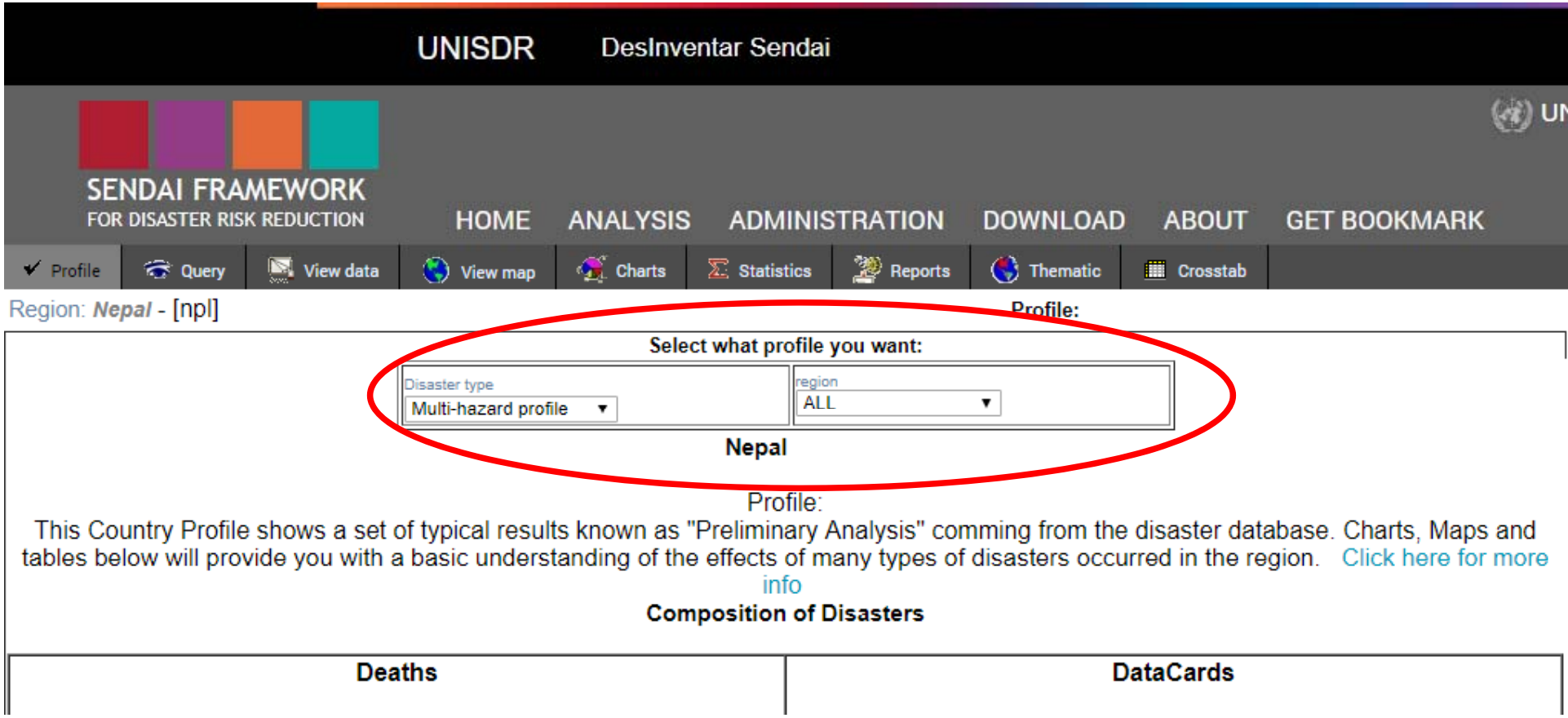
# Profile tab

## ➢ Country and province data at a glance

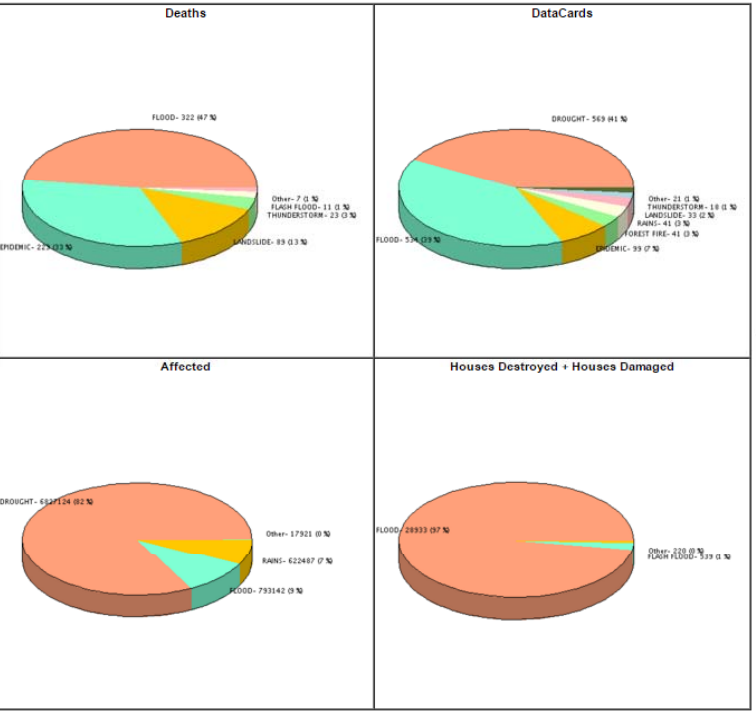
**Country data at a glance**

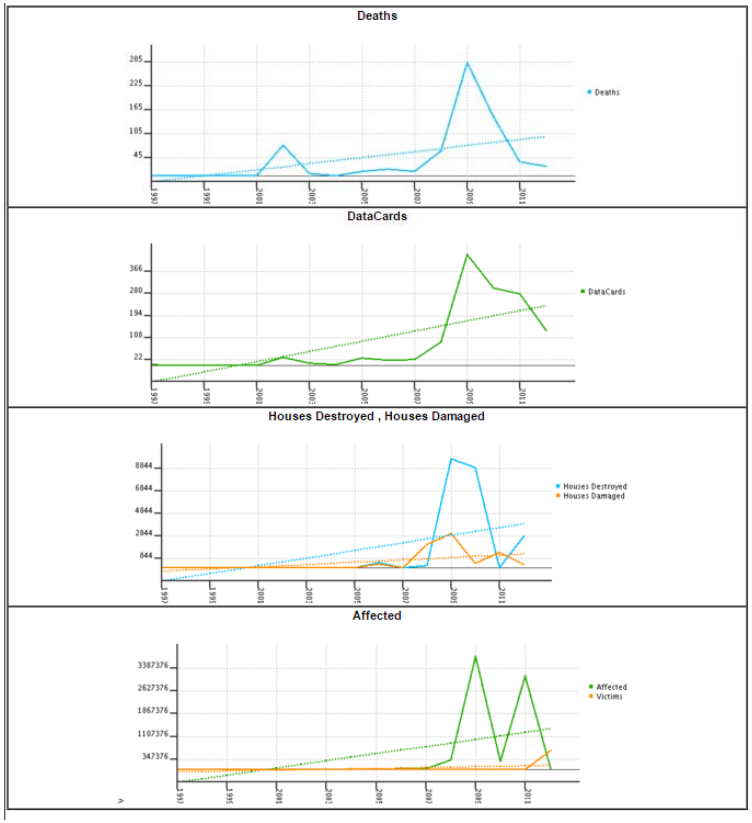
# Profile tab

- **Country and province data at a glance**

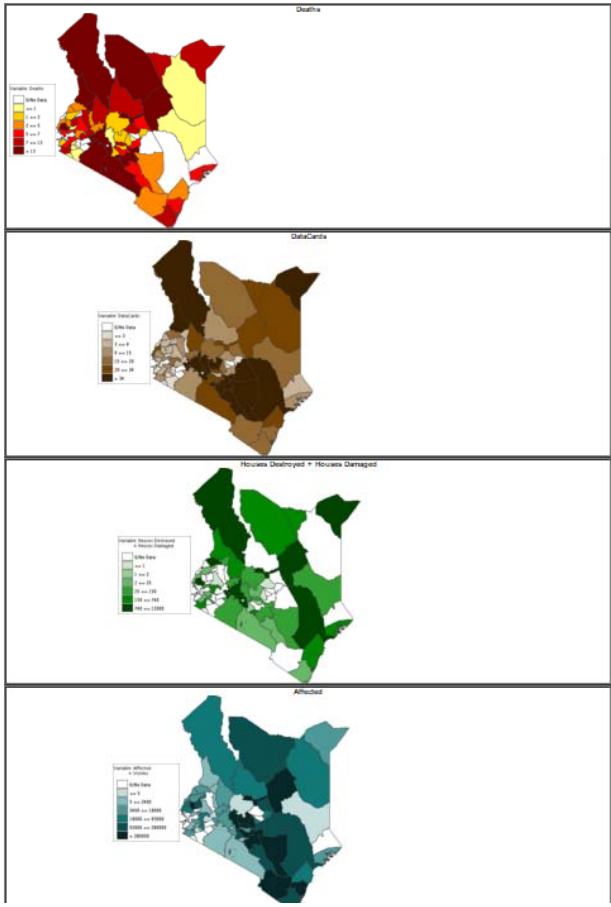
## Loss and damage by hazard




## Loss and damage in time




## Loss and damage in space



Only four indicators are provided, to give an **overview** of disaster impacts in the country or province.

# Query tab


**«Ask questions» to the database**

All selection done on the Query tab will be kept in memory on each tab

# Exercise 8

## ➢ Query: filtering the information for data analysis

Explore in your preferred database…( suggested to use Laos)

- ❖ How many records are there on Floods?
- ❖ How many records are there on Floods that killed people?
- ❖ How many records are there on Floods that killed more than 10 people?
- ❖ Can you tell how many records are there for the year of 2010 only?

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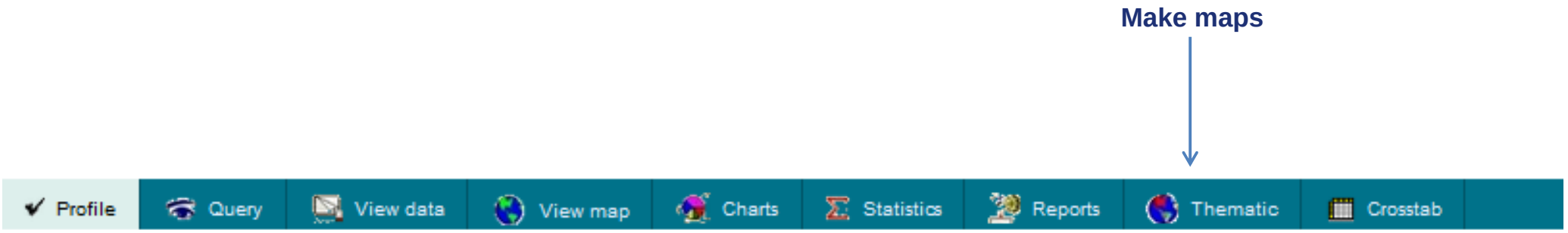
# Thematic tab

- **Build thematic maps**



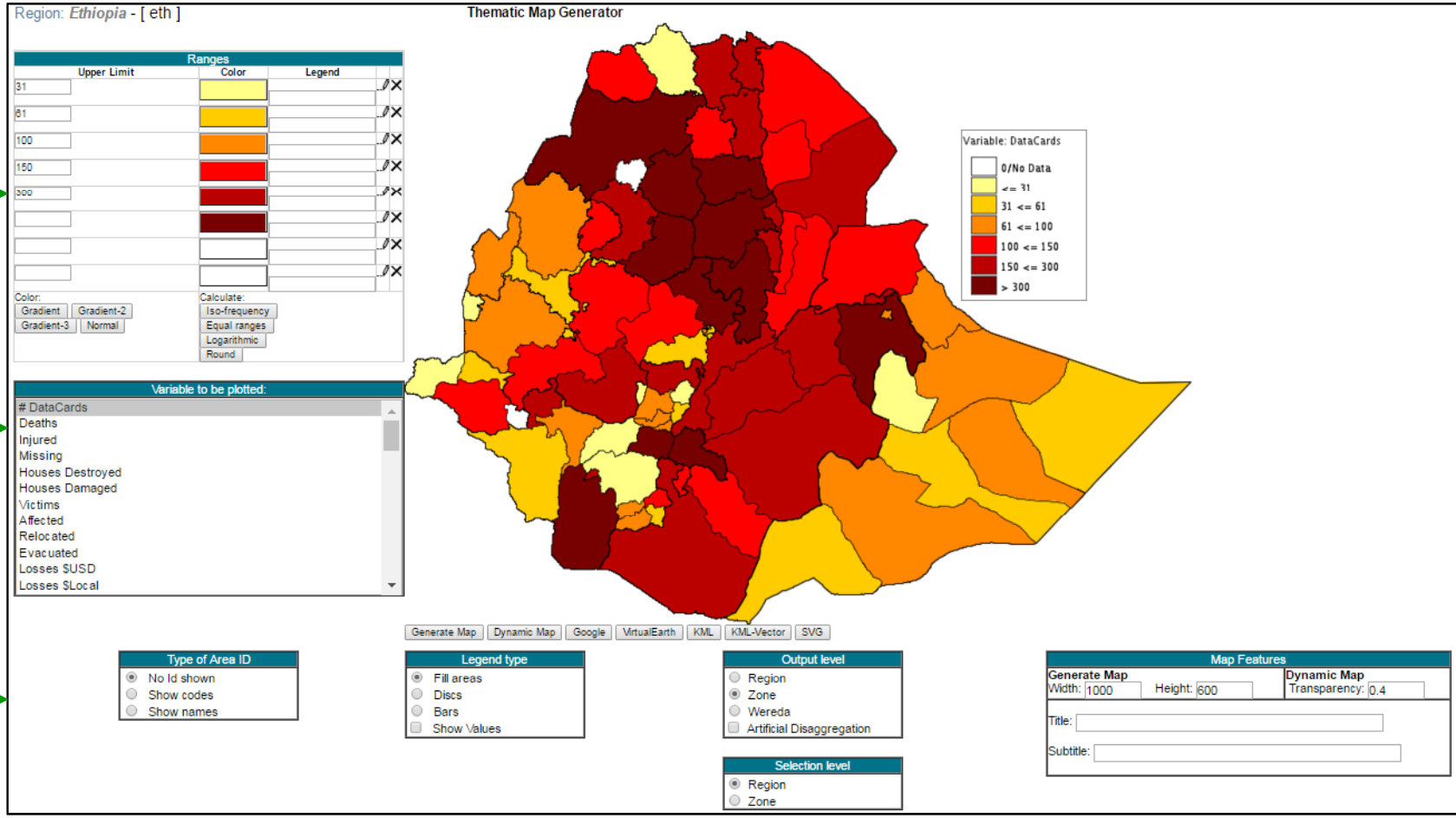
# Thematic tab

- **Build thematic maps**

**Choose the colors, and the ranges (classes)**

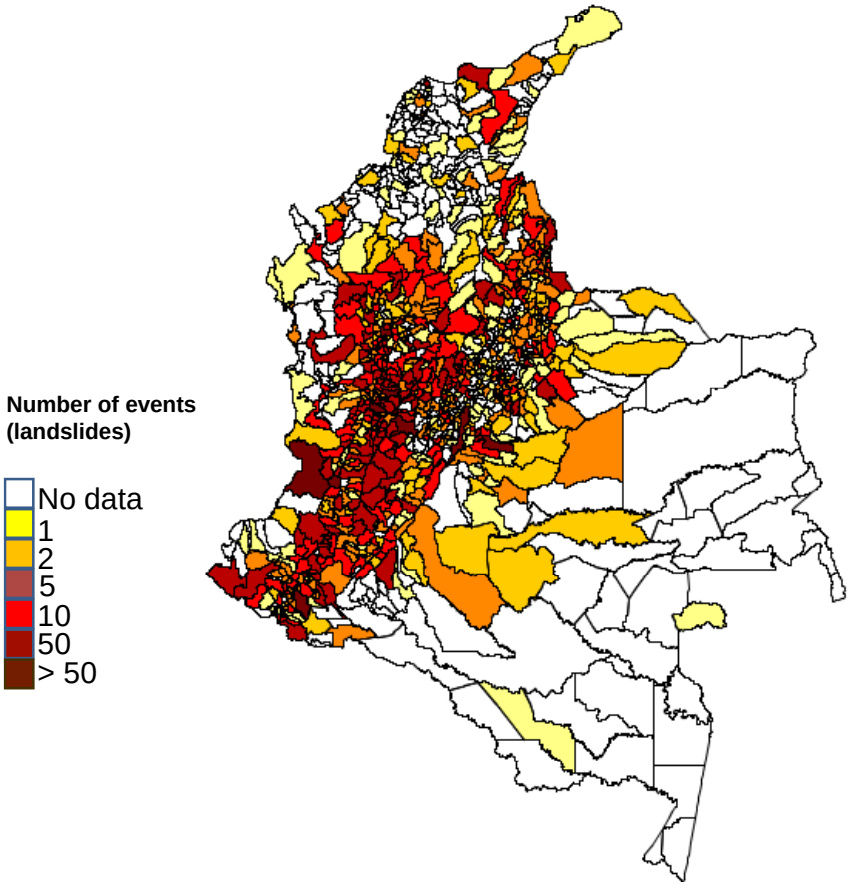
**Choose the variables to be plotted in your map**

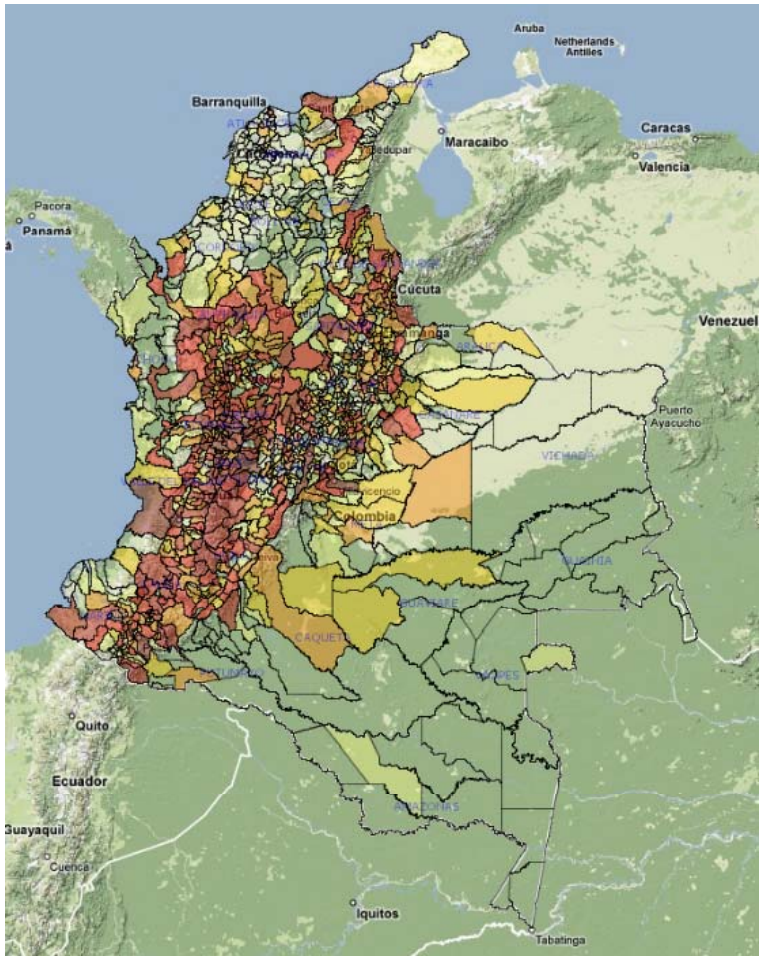
**Choose additional display options**



# Thematic tab

- **Spatial Analysis (patterns): distribution of losses over space**




## Spatial distribution of landslides in Colombia

Most of the events have taken place in the mountain regions of the Andes cordillera, that are more landslide-prone than the flat regions.

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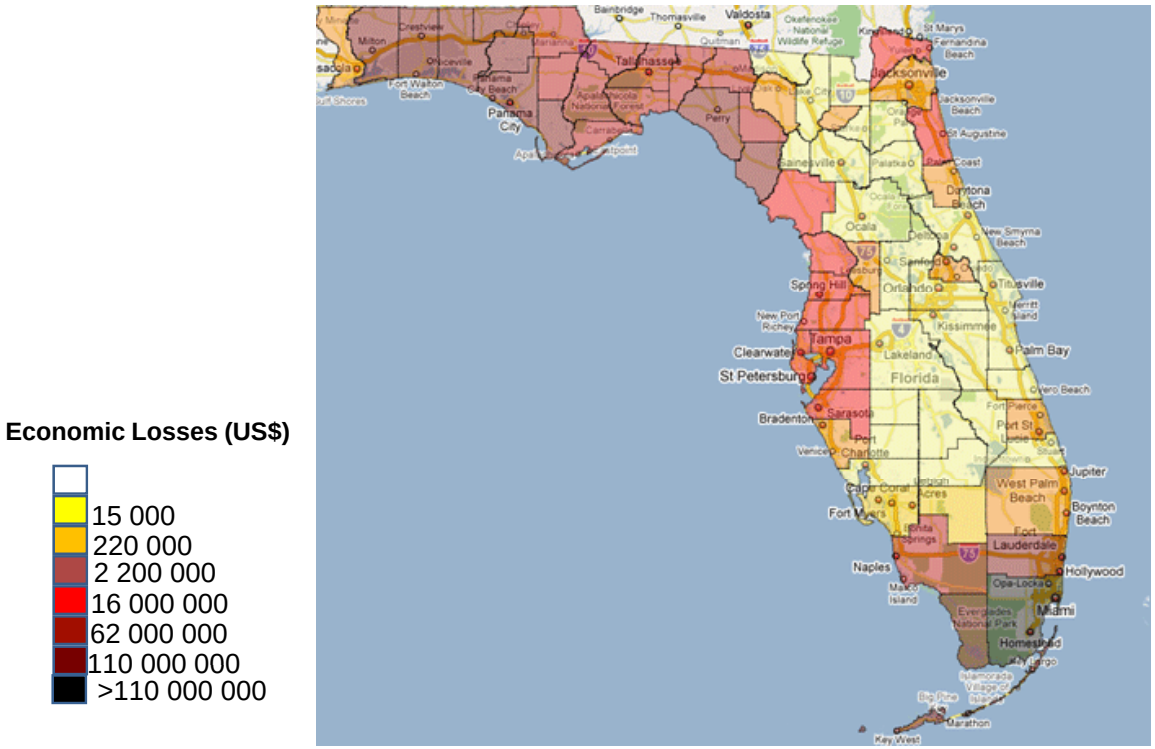
# Thematic tab

- **Spatial Analysis (patterns): distribution of losses over space**




**Spatial distribution of Economic losses by hurricanes in Florida, USA**

Counties situated in the hurricane paths have been more affected. Coastal counties in the Gulf Coast have more economic losses also due to the impact of storm surges.

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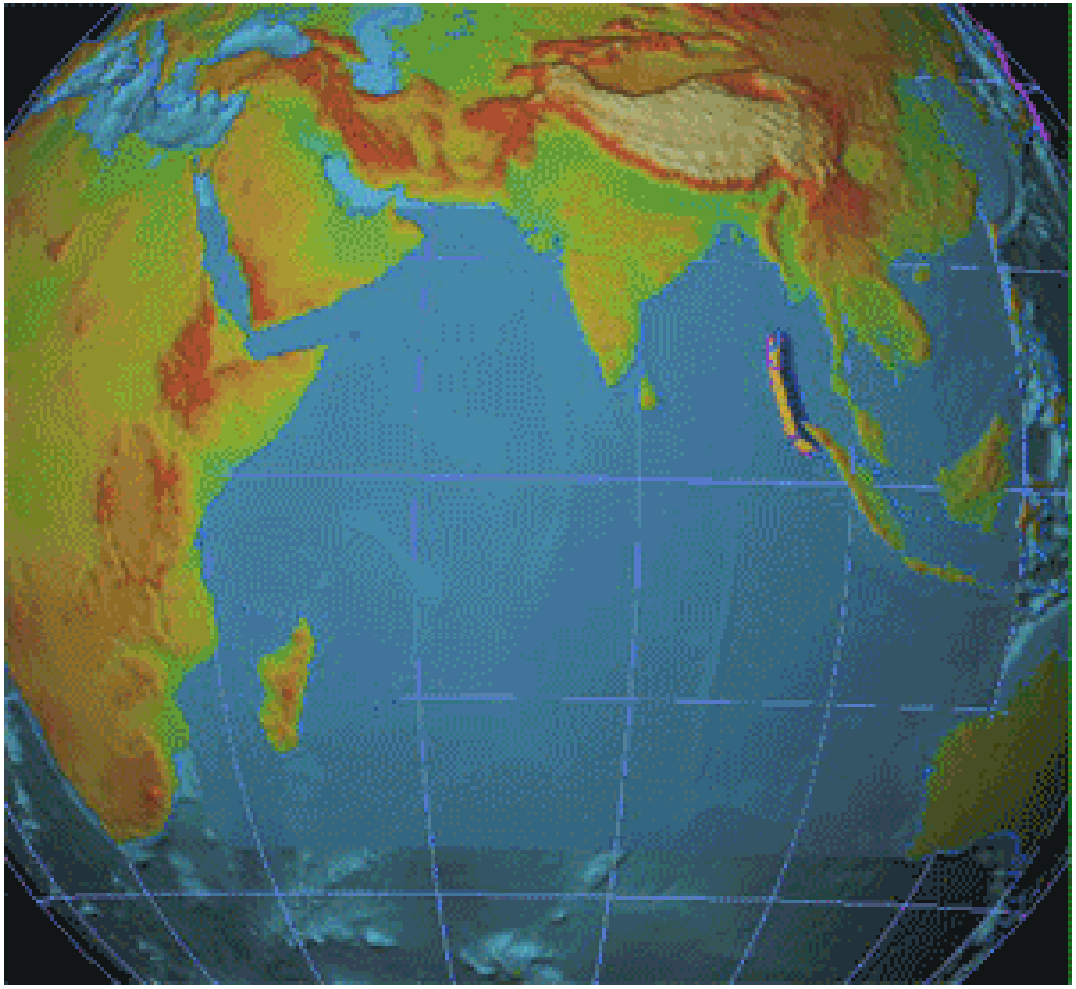
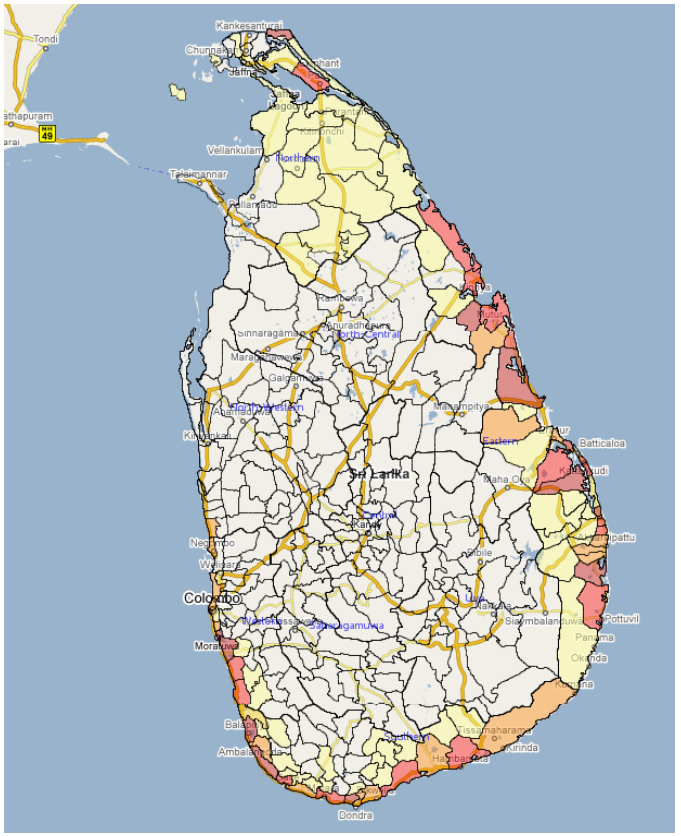
# Thematic tab

## ➢ Spatial Analysis (patterns): distribution of losses over space

Spatial distribution of houses destroyed in Sri Lanka after the 2004 Indian Ocean Tsunami.






**Number of houses destroyed**

- 28
- 84
- 1 278
- 2 557

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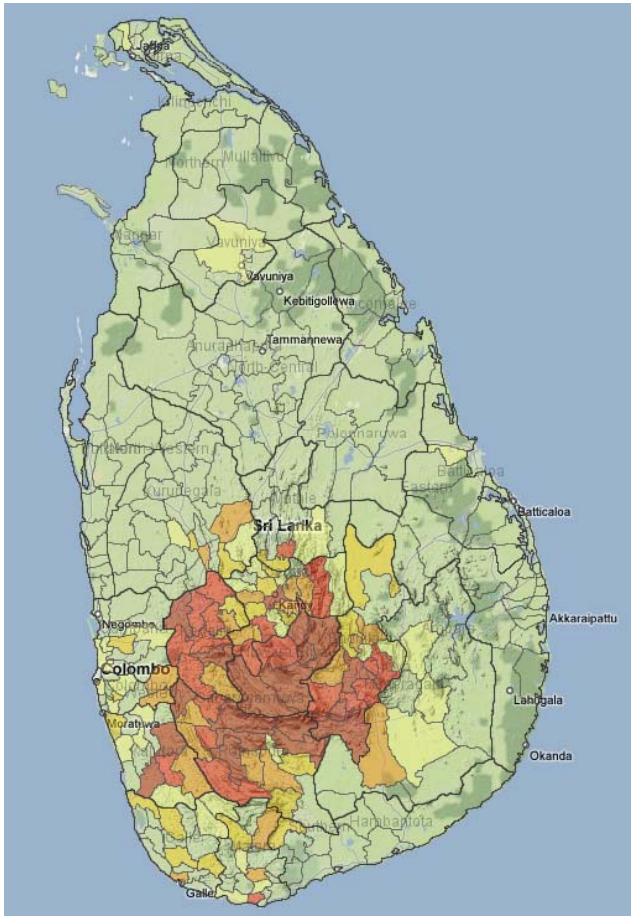
# Thematic tab

- **Spatial Analysis (patterns): distribution of losses over space**

Spatial distribution of Landslides in Sri Lanka (1970-2007).




**Number of landslides**

- <= 1
- 1 – 2
- 2 – 5
- 5 – 10
- 10 – 50
- > 50

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# Exercise 9

- **Thematic Maps**

  - Produce a map of disaster mortality (No. of deaths).
  - Produce a map of disaster mortality due to floods.
  - Produce a map of damages to crops for all hazards. Change your color gradient.

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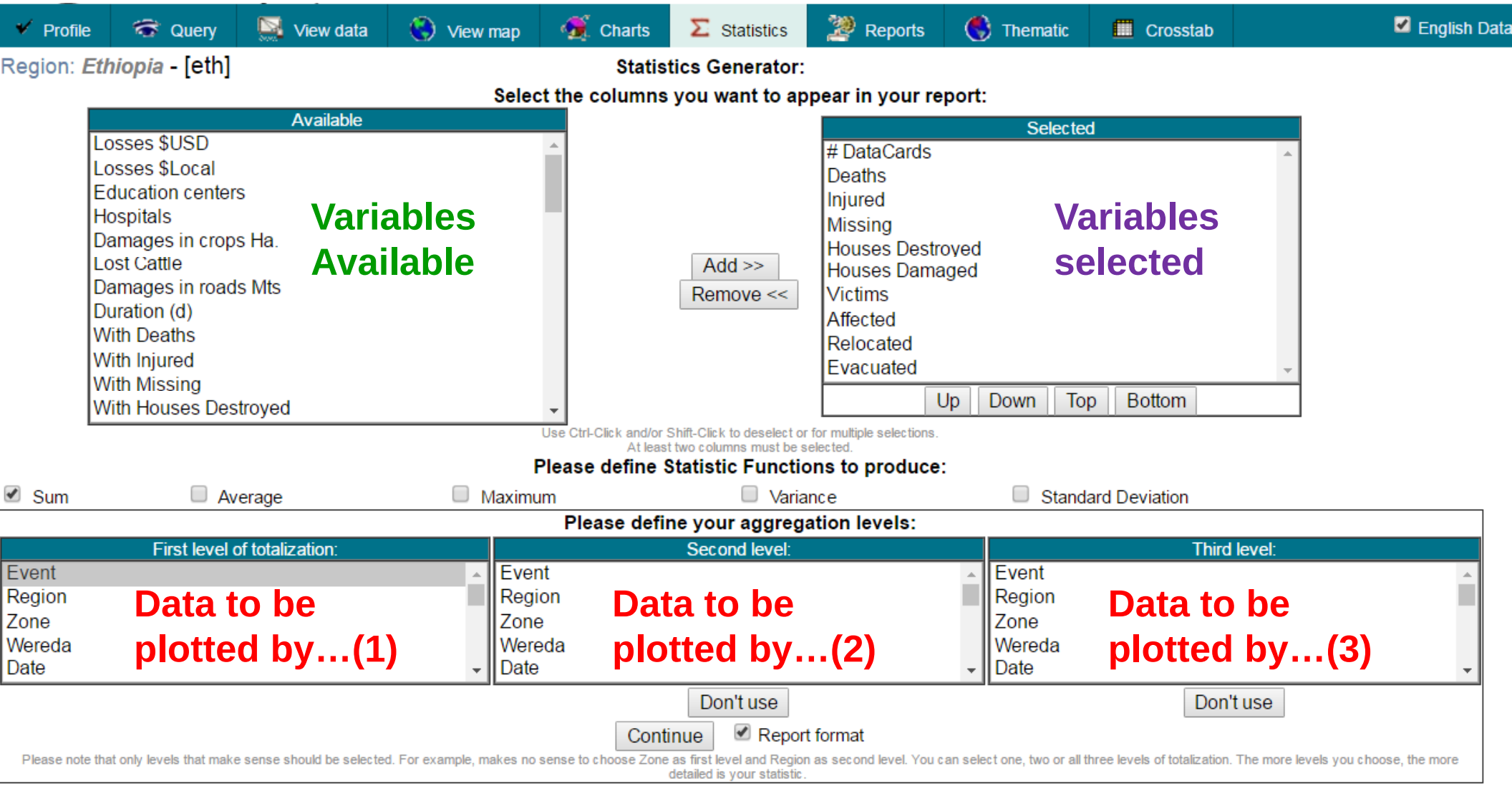
# Statistics Tab

**Do analysis and statistics**

# Statistics Tab

- **Build statistical reports**



# Exercise 10

- **Build statistical reports**

  - Build a statistical report that summarizes the number of datacards organized by hazard event. Which is the most reported hazard in the database?

  - Build a statistical report that allows you to compare, annually, between the houses that have been damaged and those that have been destroyed.

    - Download your report in Excel.

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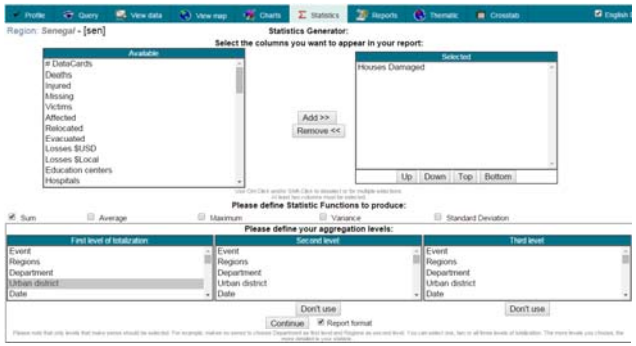
# Using statistics for decision making

## ➢ Houses damaged by floods in Dakar city, Senegal

1. Query the database

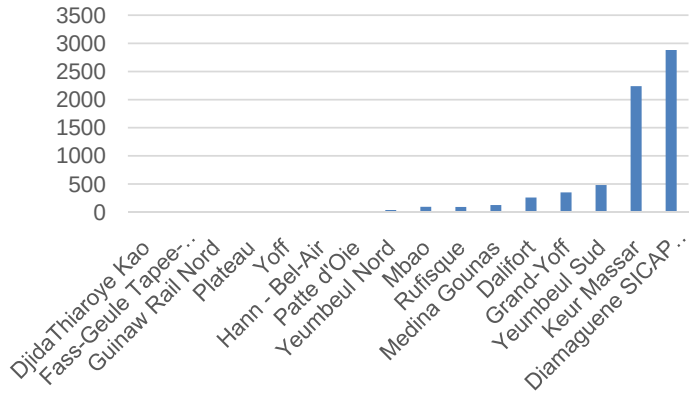


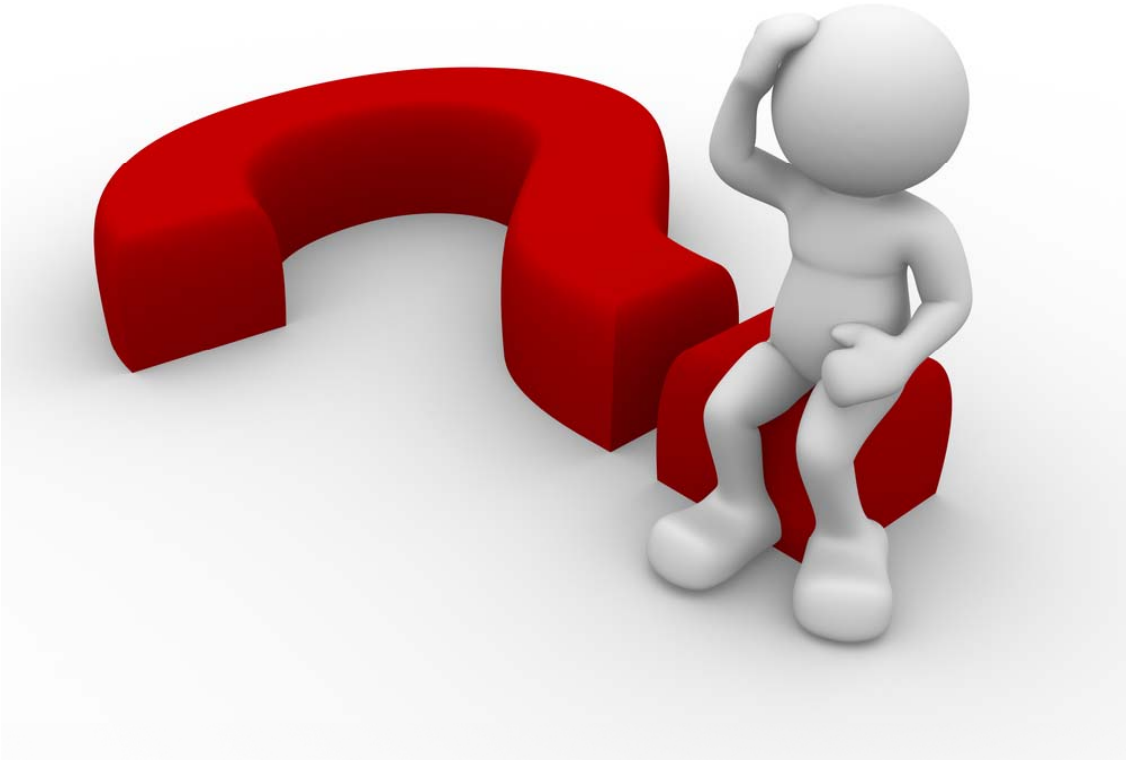

2. Extract and organize the data

| Urban district | Houses Damaged |
|---|---|
| DjidaThiaroye Kao | 0 |
| Fass-Geule Tapee-Colobane | 0 |
| Guinaw Rail Nord | 0 |
| Plateau | 0 |
| Yoff | 0 |
| Hann - Bel-Air | 1 |
| Patte d'Oie | 3 |
| Yeumbeul Nord | 37 |
| Mbao | 95 |
| Rufisque | 92 |
| Medina Gounas | 126 |
| Dalifort | 259 |
| Grand-Yoff | 350 |
| Yeumbeul Sud | 482 |
| Keur Massar | 2241 |
| Diamaguene SICAP Mbao | 2884 |
| Others | 62393 |
| TOTAL | 68963 |

3. Analyze data and build reports which will enable decision making

*This tool allows to build statistics based on nationally-sustained and reliable data, which will enable to take decisions by sector, location and priority.*





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# What is needed?

- Geographical data (GIS):
  - -Administrative boundaries (districts, municipalities)
  - -Roads, etc…
  - -Rivers
- Agricultural data:
  - -Yield, prices, area and production per district
- Disasters:
  - -Loss data since 1980 recommended, 2005 minimu
- Other statistics
  - -Population, GDP, Age Groups, Exchange rate, etc…

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# Workflow

**Who hosts the database?**

**Who validates and updates the database?**

**When the database should be updated?**

**Who is the focal point in each institutions for sharing data with the host agency?**

**Which will be the end users?**

**Who is accountable for the maintenance of the database?**

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# Sustainability

- The workflow should be maintained, with clear responsibilities.
- Quality control and updating needs to be done, to guarantee quality and reliability of the data. UNISDR can provide technical support, through gap analysis and troubleshooting.
- Channels need to be open in terms of data sharing between the different institutions and the host agency.
- Institutional commitment and synergy should function as basis for the maintenance and updating of the database.
- Data needs to be analysed and presented in reports so it functions as basis for policy and decision-making. Results should be commuicated with key partners and stakeholders.
- **Ownership means sustainability**

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# Summary

Activities to put in place:

- Identify the stakeholders
- Set a clear workflow including clear responsibilities and deadlines.
- Develop a historical research for the past **30 years**
- Start a **day-to-day** collection of losses
- Relate loss data with other socio-economic data such as Poverty, Environment, Demography, etc.
- Improve data and develop quality control
- Integrate the analysis in decision-making for improving DRR measures.

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Creating **synergies** among the institutions for data collection and follow-up is essential. Without coordination, it is very difficult to implement a successful disaster loss accounting system!

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# Thank you!