Technical workshop: validation of the prototype for the new hazardous events and disaster losses and damages tracking system

Technical Session 1: New system storyboard, purpose, functionalities and modules

Day 1 – 3rd May
Progress in developing a new generation system for tracking damages and losses – current stage: Prototype co-design and validation of needs

- **Reconfirm users needs**
- **Identify requirements for different use-cases and different expected users**
  - Requirements for data collection (primary data entry, etc.) and ingestion
  - Requirements for data transformation (import, export, overlay, data ingestion through APIs, etc.)
  - Requirements for data management (e.g., administrative levels, records vs events)
  - Requirements for system administration (customization, users, permissions, hosting, metadata, etc.)
  - Requirements for data analytics (types of pre-set dashboards (per event, per country, and profiles)
- **Identify system architecture** – global and national instances, requirements for harmonization (e.g., hazard taxonomy) /comparability vs customization/ local contextualization (local assets taxonomies, locally interesting variables on impact)
- **Develop the data model**
- **Translate into a prototype for validation** – feedback gathering purposes – options are presented
Prototype co-design and validation – Today’s Prototype validation workshop objectives

- Present current prototype draft to gather feedback from practitioners, experts and other losses and damages’ data stakeholders

- Jointly review on the system structure, functionalities for data collection, ingestion, management, analysis and visualization interfaces and usability vis-à-vis the users needs expressed and compile inputs/feedback to draft final requirements for system coding.

- Re-explain the next steps on the process to support rollout of the new system and approach.
  - After the users’ feedback is integrated into the prototype and specifications/requirements for system design, UNDRR and partners will proceed with the institutional clearance and procurement steps to contract the system development.
  - The three partners UNDRR, UNDP and WMO will continue mobilizing resources and refining frameworks, guidance and toolbox for supporting countries in addressing governance, technical capacity and methodological challenges they face when assessing losses and damages, institutionalizing data architecture and enhancing the value chain on losses and damages data
A new model and system to enhance losses and damages data value chain

Use cases - purposes for which data is used

Data collection, access or aggregation as per common standards and classifications

Technological solutions and capacity to transform data, integrate, import and export

Functionalities and technical support for analysis (descriptive, diagnostic, predictive) and statistics

Enhanced visualization with interactive options (e.g., dashboards, charts, thematic and geographic maps, etc.).

Capacity development and technical support to interpret, extract insights and implications for decision-making

Decision support tools for better policies and programs at all levels.
Schematic representation of the new model of losses and damages tracking

Recording of Hazardous Events
[National Hydro Met Services – Geophysics - Health]

Recording of Event Effects
[National Disaster Management Organizations]

Integrating context information for enhanced analytics
[Statistics offices – Sector entities]

Hazardous event Unique Identifiers

Data Standards – e.g., hazard classification, CHE.

Data Governance (SoP, workflows, procedures, roles and responsibilities, etc.).

Data Architecture

Interoperability

Official statistics, geospatial data and metadata (e.g., population density)

National classifications (e.g., assets (type of housing))

Exposure – e.g., location of infrastructure, population

Multi-dimensional vulnerabilities

Statistics Offices – Sectors Department – Environment Ministry

Data Ecosystem

Hazard system and chains
Larger phenomena/system

Cascading hazardous events

Hydro Meteorological Services/Geological Surveys, seismic/volcanic observatories, etc.

Effects: human direct effects, losses and damages

Event: Time & duration – span of effects and impacts

Footprint (spatial and temporal of effects)

Triggering/causal hazards

Needs and costing (baseline/economic valuation of losses and damages)

DRR agencies (NDMOS, Civil Protection, etc.)
Purposes of the new system

- **Tracking the effects and impacts** of disasters events over time in a systematic and disaggregated (per geographic level, per hazard, per social group affected, per sector) manner.
- **Supporting attribution analysis of impacts to causal/triggering hazards** and enhancing the ability to understand exposure and vulnerability dimensions of the impacts observed.
- Supporting **tracking of cascading effects of disasters, including socio-economic ones**
- **Facilitate quantification/accounting** (economic valuation or costing) of the damages (e.g., infrastructure assets like roads)
- **Enhance analysis possibilities** of the disaster effects to support specific applications of historic data like impact-based forecasting, calibration of risk assessments, preparedness and contingency planning, recovery planning, cost-benefit analysis to make the case for investments in DRR, benchmarking on progress on adaptation, DRR and resilience building, etc.
Purposes of the new system

- Facilitate **primary** data collection and **recording**: Modalities to feed database from multiple devices, online/offline, support multiple types of data (audio, video, image).
- Enable recording **data collection with core standard variables** and **built-in disaggregation’s** – expanding the core data model with frameworks for sector disaggregated data collection on losses and damages (methodologies, taxonomies, definitions, etc.).
- Facilitate **disaggregation – aggregations and costing** of damages and losses (from units of damaged assets to what it means in economic/monetary terms).
- **Support national processes and workflows** on data collection (e.g., subnational to national), review and validation.
- Enhance **data management and interoperability** – connecting with external datasets like georeferenced and statistical data (e.g., Population density, poverty, etc.), remote sensed impact data (e.g., flood extent satellite imagery).
- Make **easier data analysis, visualization, sharing and transforming, reusing** - e.g., pre-built dashboards with highlighted variables, graphs, etc.
Utilizing other methodological and conceptual frameworks (e.g., PDNAs)

**Damage**
- Refers to the **total or partial destruction** of infrastructure and physical assets.
- Its **economic value** is estimated at the replacing or repairing cost at market prices prevailing just before the disaster.
- Damage is valued **first in physical terms** (number of houses of a specific typology, km of roads or pipelines, size and types of schools or hospitals); and then **in terms of their monetary value**.

**Loss**
- Economic loss refers to **changes in economic flows** arising from the disaster.
- These changes in flows **continue** until the achievement of full economic recovery and reconstruction, in some cases lasting for several years.
- Loss is **expressed in current monetary value** and it includes forgone income and additional costs to put back the services, cope with governance issues and manage emerging risks.

**Effects** refer to the results of the event that is to be assessed.

**Sectors and sub-sector disaggregation**

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<thead>
<tr>
<th>PRODUCTIVE</th>
<th>SOCIAL</th>
<th>INFRASTRUCTURE</th>
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<tbody>
<tr>
<td>AGRICULTURE</td>
<td>HOUSING</td>
<td>WATER &amp; SAN.</td>
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<td>COMMERCE</td>
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**Cross-cutting**
- GOVERNANCE
- ENVIRONMENT
- GENDER
- DISASTER RISK REDUCTION
- EMPLOYMENT & LIVELIHOODS

**Effects** are manifested in physical terms or in visible changes to processes.
Storyboard

**Data storage and management**
- Recording of data from multiple types and format of assessments
- Link data records to (disaster) events, to sectors, to geographies, to hazardous events, etc.
- Facilitate review, update, validation process
- Assign roles to users for data entry, validation, edit, etc.

**Data entry**
- All type of events with some standard/core variables
- Support primary data collection and assessment processes
- Make easier aggregation/disaggregation
- Metadata

**Data analysis**
- Pre-built visualization templates (dashboards)
- Add external contextual information to support impact analysis (e.g., Demographic, GDP)
- Customized analytical functions (queries, graphs, statistics, maps)
- Exports
Modules of the system

Data entry and management

Analysis module

Administration module
Building on Desinventar conceptual model

1. Subnational database – National Authority:
   Sources, Users/Permissions, Geographic Levels, Geographic Units, +effects, +events, time window..

2. Local database (one **District**) – Local Authority:
   **Events**: List of (applicable) hazards and definitions

3. **Effects**: Pre-defined + user-defined effects

4. **Historical** \( (\text{YYYY-MM*-DD*}) \) **Daily**

5.
   - Province1
   - District1
   - Municipality1
   - District2
   - Municipality2
   - Municipality3
DesInventar Conceptual Model: DLDB Effects

Effects: Damages, Losses and disruptions (values* and disaggregation)

Classic mode | Sendai mode – Align with Sendai Targets and indicators

Human effects with Sex, age, disability disaggregation

Number of deaths (A-2)

- Total of Deaths (Sub-indicator A-2a):
  - By sex: Female, Male
  - Total: Number

Injured or Ill (B-2)

- Total Injured/Ill (Indicator B-2):
  - By sex: Female, Male
  - Total: Number

Second level of disaggregation:
- Agricultural **Crop** Loss (C-2C)
- Agricultural **Livestock** Loss (C-2L)
- Damages and losses in all other **Productive Assets** (C-3)
- Damages and losses to other infrastructure (C-5, D-4)

* Quantitative or Qualitative record: a numeric value or a True-False there were. (for some variables)
**Governance of the system**

- **Country/ Member States ownership** – government official data: administrators will be able to configure access levels for data producers and reviewers in country, including at sub-national administrative levels.

- **Core variables** and recording of event (with hazard taxonomies) and effects (human, damages, losses and disruption) to allow **comparability + customizations** facilitated (sectors, assets categories, etc.)

- Some common **data uses facilitated**

- **Open-source software tool** being designed for governments to host in their premises or global hosting supported options

- **Data exchange, synchronization and sharing** of data for publication in regional and global dashboards facilitated.

- **Package of technical support** : technical assistance, methodological guidance, manuals, training, etc. by UNDRR, UNDP, WMO and other partners. Support to strengthen information governance - not only on technological solutions.
Thank you