Technical workshop: Validation of the prototype for the new hazardous event and disaster losses and damages tracking system

Session 3: Analytics
Data Available for Analysis
Data Available for Analysis

Core data from losses and damages data collection process

- **Events** – defined as per national definitions/ no thresholds (hazardous event, names, codes, dates, footprint, etc.)
- **Effects** – human effects, damages, disruption and losses

Ingested data to enable analysis of impact of disasters

- **Baseline** (or pre-disaster information) or **External** (contextual, e.g. GDP per sector, population density, etc.)
Events

- An event is related to a hazard that causes damage.
- Events can be named (eg. Cyclone Idai) or unnamed (eg. forest fire)
- The damages as well as the losses and disruptions related to an event are captured by **effects**
- Events table can also store metadata on the event. eg. Cyclone path, windspeed, magnitude, etc. that can be visualized and included in analysis.
Example Event: Cyclone Idai

**Hazard type:** Tropical Cyclone  
**Date:** March 9th, 2019  
**Glide:** 2019-000021  
**Country:** Mozambique  
**Max Wind Speed:** 185 km/h  
**Other countries affected:** Zimbabwe, and Malawi  
**Associated events:** strong winds, heavy rain, storm surge

Hazard footprint of the Cyclone Idai  
Source: WMO
**Effects**

- Effects are an accounting of the negative effects of a disaster including human direct effects, damages and losses.
- Effects include the cost of damages by **sector** and **asset type** (total cost, repair cost, recovery cost).
- **Human direct effects**: eg. dead, injured, displaced.
- **Disruptions** by sector: e.g. Days of school lost, increased dropout rates.
- **Losses** by sector (as per DALA/PDNA definition): e.g. Debris removal; additional cost of providing services (truck distribution of water, etc.)
Effects

- Effects can be disaggregated by:
  - Event
  - Hazard
  - Affected sector
  - Asset Type
  - Service affected (for disruptions, e.g. primary education, drinking water distribution)
  - Time; season, year, month
  - Geography – geographic level – location
Effects

Effects can have a **precise location (GPS)** or be and linked to an **administrative area**
Pre-Disaster Data

- Baseline data can be entered into DLDT to provide context and enhance analysis options to the reported disaster effects.
- Data should be assigned to specific admin areas in the country to facilitate analysis and visualization.
- Examples include: population, GDP, poverty rate, agricultural yields, etc.
Pre-disaster: People Affected vs Population

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Types of Analytical Functionalities
Type of Analysis

- Self-Service Analytics
- Built-in Analytics
- External Analytics & Data Exports
Built-in Analytics

- Self-service Analytics: chart and map builders that allow you to generate visual reports within the platform.
- Pre-built Analytics: DLDT will initially come with four default dashboards to view data:
  - Effects browser - Ability drill down and view effects filtered by any combination of events, hazard type, sector, etc.
  - Post Disaster Event Analysis - Provides an overview of the impacts (in terms of sector, geography, population groups affected) according to the principles of a PDNA analysis.
  - Sector Impact - Ability to view the impacts by sector for multiple hazard events
  - Hazard Impact - Ability to view the sector impacts by specific hazard types.
  - Data Story Telling? - Ability to tell stories aimed at the public

- The DLDT Global Instance will support the following additional analysis
  - Global Hazard Impact - Ability to view impact of disasters by hazard across countries
  - Global Sector Impact - Ability to view impact of disasters by sector across countries
Charts: Stacked Bar

Total Displaced by Year

- Dam
- Heavy rain
- Snowmelt, Ice, Rain
- Tropical Storm, Surge
Charts: Pie Charts

- Infrastructure Sectors: 58%
- Productive Sectors: 42%
Charts: Time Series (Area Chart)

Displacements over time

Total People Affected

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Charts: Small Multiples (Facets)

Total Displaced by Country

India

Nicaragua

Bangladesh

China

Pakistan

Nepal

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Charts: Metrics

Total Events: 66
Damage: 1,430,000$L
Loss: 1,470,731$L
Recovery: 1,601,600$L

Damage
Loss
Recovery need
Human Impact by event

LT-2023-03-07-DL42
- Displaced
- Tertiary affected
- Missing
- Primary affected
- Deaths
- Injured
- Secondary affected
- Assisted displaced

LT-2021-10-31-DL51
- Displaced
- Tertiary affected
- Injured
- Secondary affected
- Primary affected
- Deaths
- Missing
- Assisted displaced

LT-2017-08-19-DL41
- Displaced
- Tertiary affected
- Secondary affected
- Injured
- Missing
- Primary affected
- Deaths
- Assisted displaced

Nature of how people were effected by group
## Summary Tables

<table>
<thead>
<tr>
<th>Country</th>
<th>Floods</th>
<th>Total Displaced</th>
<th>Total Dead</th>
<th>Total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>85</td>
<td>113,671,436</td>
<td>14,905</td>
<td>915,390</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>3</td>
<td>27,226,340</td>
<td>146</td>
<td>3,391</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>23</td>
<td>21,260,000</td>
<td>5,690</td>
<td>470,617</td>
</tr>
<tr>
<td>China</td>
<td>52</td>
<td>17,042,221</td>
<td>4,359</td>
<td>323,481</td>
</tr>
<tr>
<td>Pakistan</td>
<td>25</td>
<td>14,237,415</td>
<td>4,644</td>
<td>184,833</td>
</tr>
<tr>
<td>Nepal</td>
<td>10</td>
<td>10,531,000</td>
<td>1,355</td>
<td>142,427</td>
</tr>
<tr>
<td>Philippines</td>
<td>44</td>
<td>6,853,281</td>
<td>4,503</td>
<td>59,068</td>
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<tr>
<td>Thailand</td>
<td>28</td>
<td>5,526,969</td>
<td>1,823</td>
<td>369,198</td>
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<tr>
<td>USA</td>
<td>87</td>
<td>3,320,517</td>
<td>1,478</td>
<td>530,893</td>
</tr>
<tr>
<td>Colombia</td>
<td>12</td>
<td>2,605,400</td>
<td>1,236</td>
<td>67,949</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>9</td>
<td>2,337,281</td>
<td>154</td>
<td>3,428</td>
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<tr>
<td>Taiwan</td>
<td>4</td>
<td>1,842,700</td>
<td>162</td>
<td>2,421</td>
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<tr>
<td>Burma</td>
<td>7</td>
<td>1,548,800</td>
<td>100,028</td>
<td>50,952</td>
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<tr>
<td>Cambodia</td>
<td>6</td>
<td>1,458,600</td>
<td>872</td>
<td>124,756</td>
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<tr>
<td>Vietnam</td>
<td>20</td>
<td>1,155,600</td>
<td>691</td>
<td>268,755</td>
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<tr>
<td>Madagascar</td>
<td>8</td>
<td>1,068,300</td>
<td>374</td>
<td>13,731</td>
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<tr>
<td>Mexico</td>
<td>15</td>
<td>1,040,180</td>
<td>365</td>
<td>38,715</td>
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<td>Malawi</td>
<td>3</td>
<td>786,000</td>
<td>322</td>
<td>7,767</td>
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<tr>
<td>Indonesia</td>
<td>39</td>
<td>783,946</td>
<td>853</td>
<td>46,623</td>
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<tr>
<td>Ghana</td>
<td>5</td>
<td>685,600</td>
<td>231</td>
<td>12,367</td>
</tr>
</tbody>
</table>
Map Builder

Map and Chart Builder

- Total Loss
- Total Damages
- Total Loss
- Total Recovery Cost
- Total Human Affected
Choropleth Map
Circle Map

- 795000
- 207500
- 382500
- 692500
- 655000
High Resolution Satellite and Drone Imagery

Damaged Railroad
Custom Indicators (Measures)

NAME
total_assets_affected

LABEL
Total Assets Affected

TYPE
number

SQL
sum(${quantity}) filter (where ${human_effect} is null)

PREFIX

FORMAT
0,000

SUFFIX

Save
Data Exports

Total Damages by Region

- DL51
- DL42
- DL32
- DL41
- DL24

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Web Embeds

Embed

HEIGHT

COMPONENTS

☑ CHART

EMBED CODE


PREVIEW

Total Damages by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Damages</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL51</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>DL42</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>DL32</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>DL41</td>
<td>$750,000</td>
</tr>
<tr>
<td>DL24</td>
<td>$500,000</td>
</tr>
</tbody>
</table>

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# Pre-Built Analytics

## Lightning strike disaster Impact

<table>
<thead>
<tr>
<th>People affected</th>
<th>Total Damages</th>
<th>Total Loss</th>
<th>Total Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>612,500$L</td>
<td>18,194,998$L</td>
<td>674,800$L</td>
</tr>
</tbody>
</table>
External Analytics and Data Exports

- DLDT will make it easy for users to connect their favorite BI / data visualization tool to the platforms data allowing them to create reports and data visualizations with the tools with which they are most familiar.

- Data can be easily exported to CSV/Excel or programmatically via an API for easy data sharing and analysis in external tools.
External: eg. High Resolution Data

- Highly detailed data from external sources. Eg. Population, Vegetation indexes, flood damage, etc.
Methods to visualize Population
Example
Example: Total Damages
Examples
Links

- DLDT: https://pumba-app.onalabs.org/analysis
- Cyclone - https://app.akuko.io/post/f0edfca3-ce4e-4a55-803a-14a8f9cbdd6e
- Flood Map: https://app.akuko.io/post/5cd3182c-3c79-4053-ba53-c47602bda125
- https://theplotline.xyz/pages/pk-flood/
Multi-Hazard

Cyclone Effects Mozambique

- Cyclone Idai
- Cyclone Kenneth

Sources: OCHA - Mozambique Impact of Cyclones, Meta High Resolution Population Density Maps

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Examples

Damage by sector

- Transportation
- Housing
- Agriculture
- Energy & Electricity

Damage by region

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Thank you