Disaster Tracking System for hazardous event, losses and damages

Background and introduction

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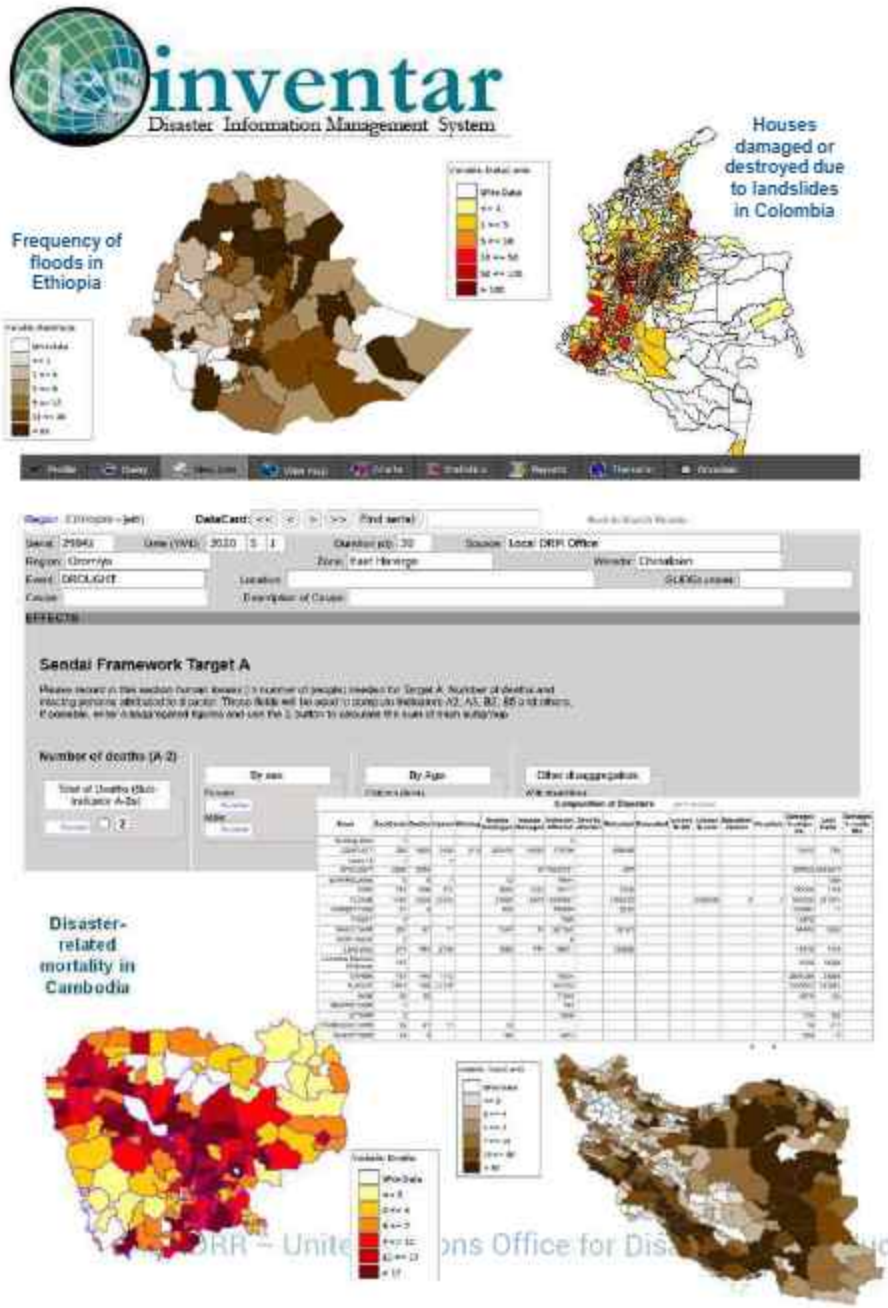
Understanding past impacts is key to prevent, reduce and manage current and future risks

From losses and damages ***data*** to **insights** for risk informed action

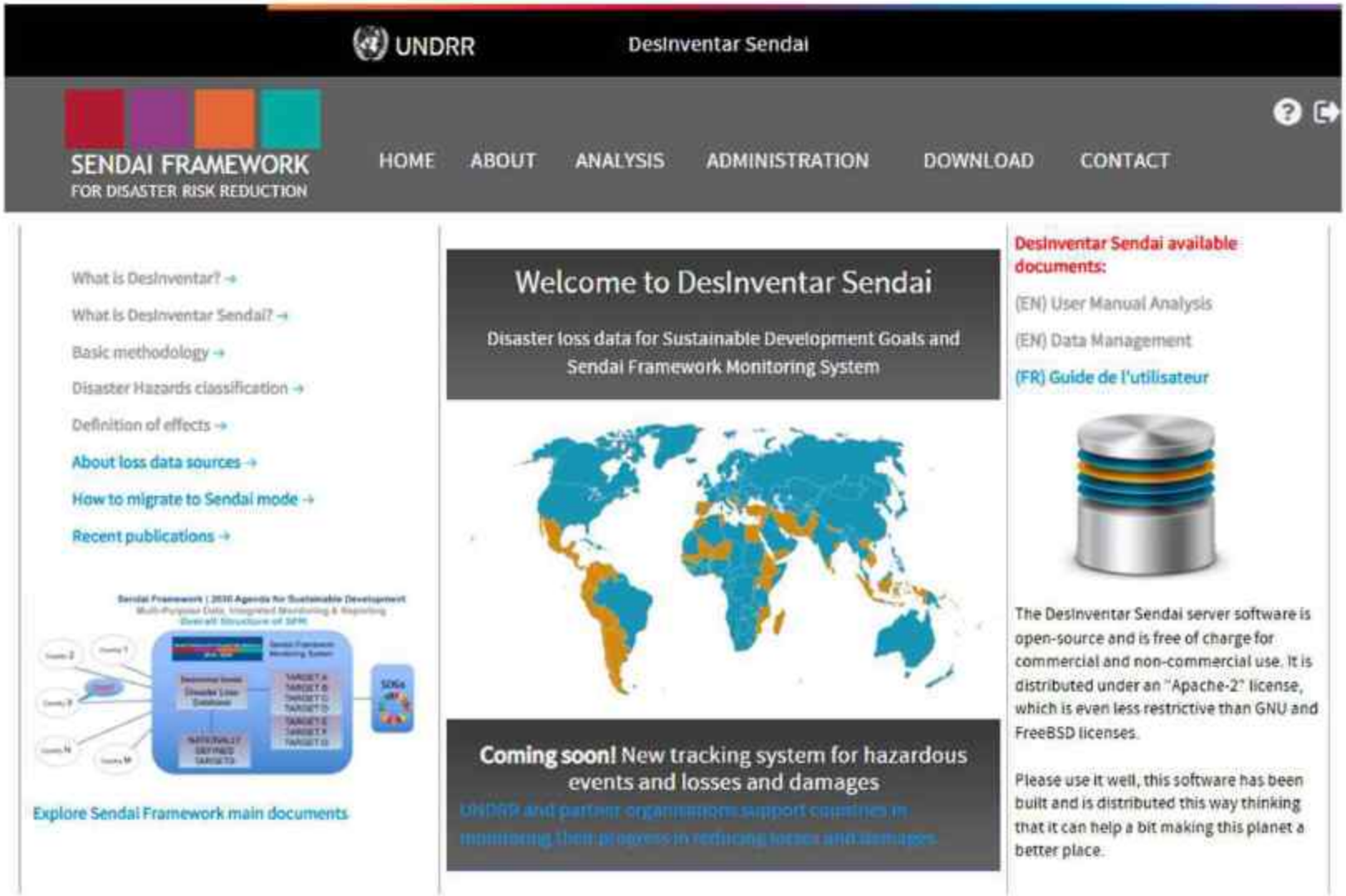
Where we come from - disaster losses and damages data



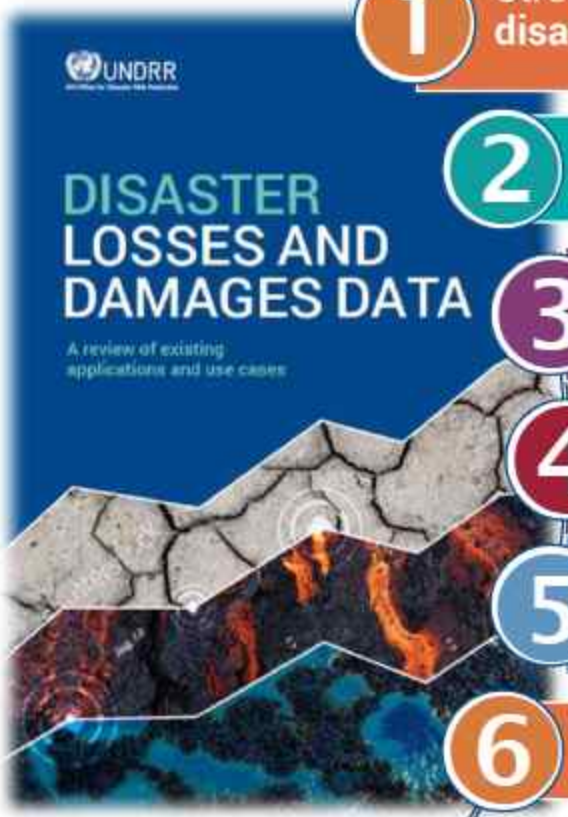
113 countries with sub-nationally disaggregated disaster losses and damages databases
+750,000 disaster **events** recorded since 1994.

- **Comprehensive disaggregated picture –** but patchy. Temporal, spatial and variable data gaps.
- **Nationally owned databases (mostly):** but some maintained by academia/regional organizations, or consultants.
- **Methodology and homogeneous data model but flexible.** Core variables with recommended disaggregation – additional region-specific extension variables
- **DesInventar Sendai:** since 2017, closer alignment with relevant Sendai Framework targets and indicators – used to fill in gaps for analysis and reporting

Legacy system – a quick tour of Desinventar.net



Supporting increasing applications and use cases



1. Strengthening the **understanding of (differentiated) impacts of climate change and disasters** .Building, informing, and calibrating vulnerability and risk models
2. **Financing**: Assessing **losses and damages, DRR and adaptation financing**
3. **Risk-informing planning**: development and sectoral planning (e.g. Infrastructure, agriculture, etc.)
4. **Better** (inclusive, gender-responsive, effective) **disaster risk reduction & climate financing**
5. **Informing early warning systems** (impact-based forecasting), early action identification, preparedness for response and contingency planning. Measuring effectiveness
6. **Informing resilient recovery** - post-disaster needs assessments
7. **Benchmarking success** (or failure) of resilience building measures: monitoring progress, assessing effectiveness (Disaster risk reduction, adaptation, L&D)

How is DTS different from Desinventar

Strengths of legacy system	Issues with legacy system & data	DTS solution
Data **per event** - effects **geographically disaggregated**	**Geographic and temporal gaps** **Data quality & quantity - few robust variables**	**Data governance (standard definitions, sample SoPs)** to support institutionalization **Georeferencing**
No thresholds on impact – national definitions Possibility to identify **"causal hazards"**	**Multiplicity of records to register each disaster event** **User-introduced hazard types and variables**	**Standard hazard classification** **Unique IDs and summary record** (**Data dictionary** and metadata **Linking parameters –** cascading hazards chains
Effects recorded for all types of events, **Core variables** on productive and services sectors	**Unstructured comments fields** **Effects data with no context to understand impacts**	**Connect losses and damages with context and baseline/reference data** **Expanded sector disaggregation**

How is DTS different from Desinventar

Strengths of historic data & system	Issues with legacy system	DTS solution
NDMAs engagement- widely use	**Institutionalization –** regular and comprehensive multi-sector data collection **Linkages to offline or newly digitized field survey** and data collection templates	**Strengthened data governance,** institutionalization & data officialization **Support data coordination and workflows**
Human impact (mortality, affected) best recorded **Physical damage units** recorded (houses, crops, etc.)	**Disaggregation-** sex, age, income, disability **lacking** **Limited economic valuated damages and losses**	**Enable multiple disaggregation to capture intersectionalities-** showcasing disaggregated data value **Methodological guidance for economic valuation of damages, disruptions and losses**
No thresholds on impact – national definitions **Effects recorded** for all types of localized (extensive) events	**Data on losses and damages requires contextual analysis to understand impacts** (e.g., food security, access to services, etc.) Metadata	**Connect with context and baseline data –** analyze in context and tell a story **Sector disaggregation** on losses and damages **Integration of reference data** (e.g. sector statistics), **vulnerability and exposure**

How is DTS different from Desinventar

Strengths of historic data	Issues with legacy system	DTS solution
Comparability of data – core indicators **Desinventar Sendai**	**Linkages** - understanding chains and attribution **Tracking slow-onset,** environmental and cultural dimensions	**Linking to hazardous event parameters (incl. cascading events)** **Assessment methodologies** (adaptation for slow-onset, PDNA approach for **costing** damages and losses.
Multiple applications tested in countries: preparedness, recovery	**Data quality –limited data officialization.** **Limited economic valuation –**	**Interoperability** with risk data **– linkages and integration** national statistics platforms, spatial data infrastructures **Guidance on application**
Open-source customizable solution to maintain databases	**Old technology – limited GIS and data visualization , automatic data ingestion** **Digitally isolated platforms**	**Modular approach and scalability** **Strengthened built-in and on-demand analytical functionalities**

What is continued from Desinventar

Software approach

- Open source – customizable software
- Downloadable – hosted in country or local server

Expandable data model

- Core variables with additional extensions
- Encouraged (but optional disaggregation + expanded pre-set options)

Data migration

- Migration pathways Desinventar → DTS (middleware for migration and reclassification)

Interopera-bility

- API towards Sendai Framework Monitoring reporting portal maintained
- Import and Export options continued

What is different in DTS software from Desinventar

Data model - extended	• Hazardous event – Effects – Baseline/Reference – Impact analysis • + Geographic level (unlimited) + geo-referenced records • Linkages parameters – associate losses and damages to hazardous events or other disasters • Effects records wrapped around social, productive and infrastructure sectors • Hazard list (events in DI) – as per UNDRR/ISC Hazard classification/ HIPs
Analytical	• Impact analysis tools – leveraging baselines, exposure and vulnerability • Pre-configured data visualization – dashboards, report layout • Computation of losses and damages – as per different costing/prices and scenarios
Open-source approach	• Open-source approach – code contributions encouraged (e.g. in the future through hackathons, datatons, etc.) • Countries have the option of using the country instance as offered, or customize it further • Peer-learning – community of contributors' idea
Governance	• Official database - government-owned only (academia and Regional organizations support/technical assistance role) • Database administration, contributors/user roles assignments and data privacy as per country regulations • Quality control and validation – as per countries mechanism
Synchronization	• Automated sync (in the future) - National to other instances (including Global UNDRR instance (aggregator) or any regional Instance (aggregators, regional analysis) • Regional Organizations – could synchronize and create dashboards and analysis relevant for their custom-set region

Key elements of the enhanced Disaster Tracking System

Data standards and assessment methods

Open-source software development

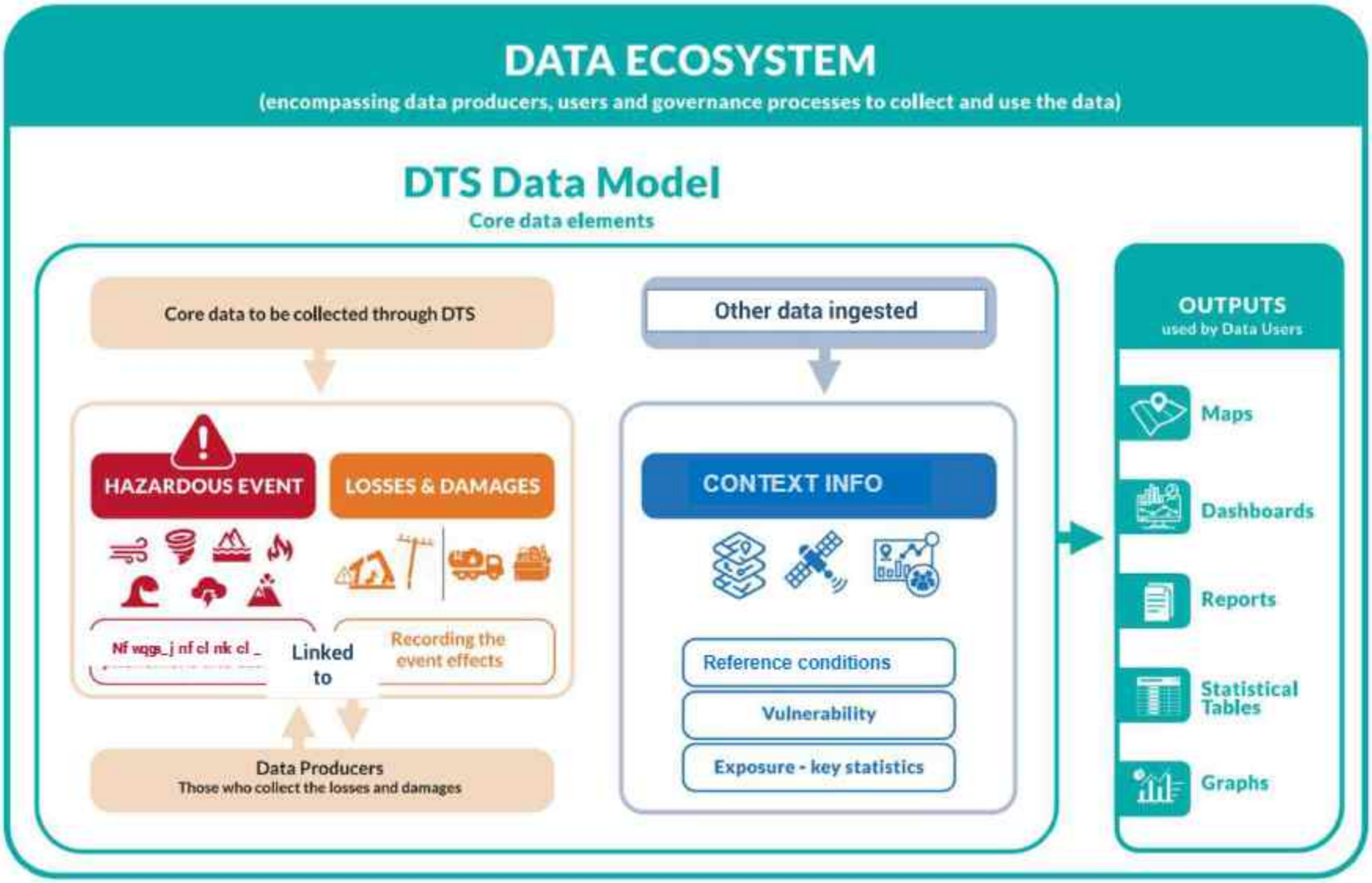
For national instances/ governments use

Use cases Applications

Capacity development & technical assistance

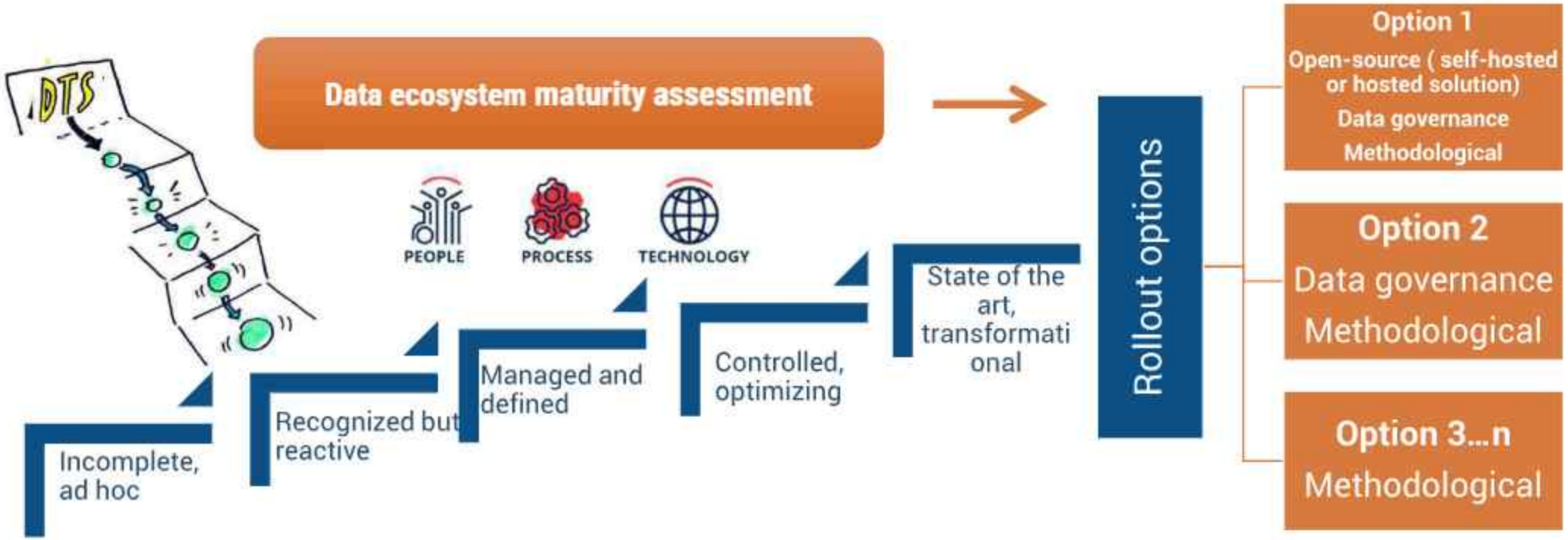
Partnerships

Better data for insights for climate and disaster resilience building

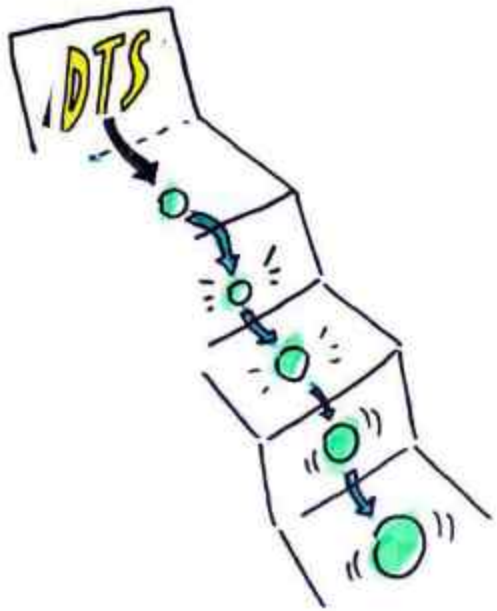


Rollout approach: technical assistance and support package

- **Data migration** - from the legacy systems (Desinventar or others) to the DTS
- **Technical assistance to strengthen ecosystem for data production and use**



Country DTS Engagement



01 Expression of interest

01 Country Maturity Assessment

02 Country DTS Rollout Work Plan

03 Mapping funding need to sources

Country DTS rollout work plan

Building blocks

Enablers

Technical Assistance & Capacity development

ASESSMENT and DIAGNOSIS

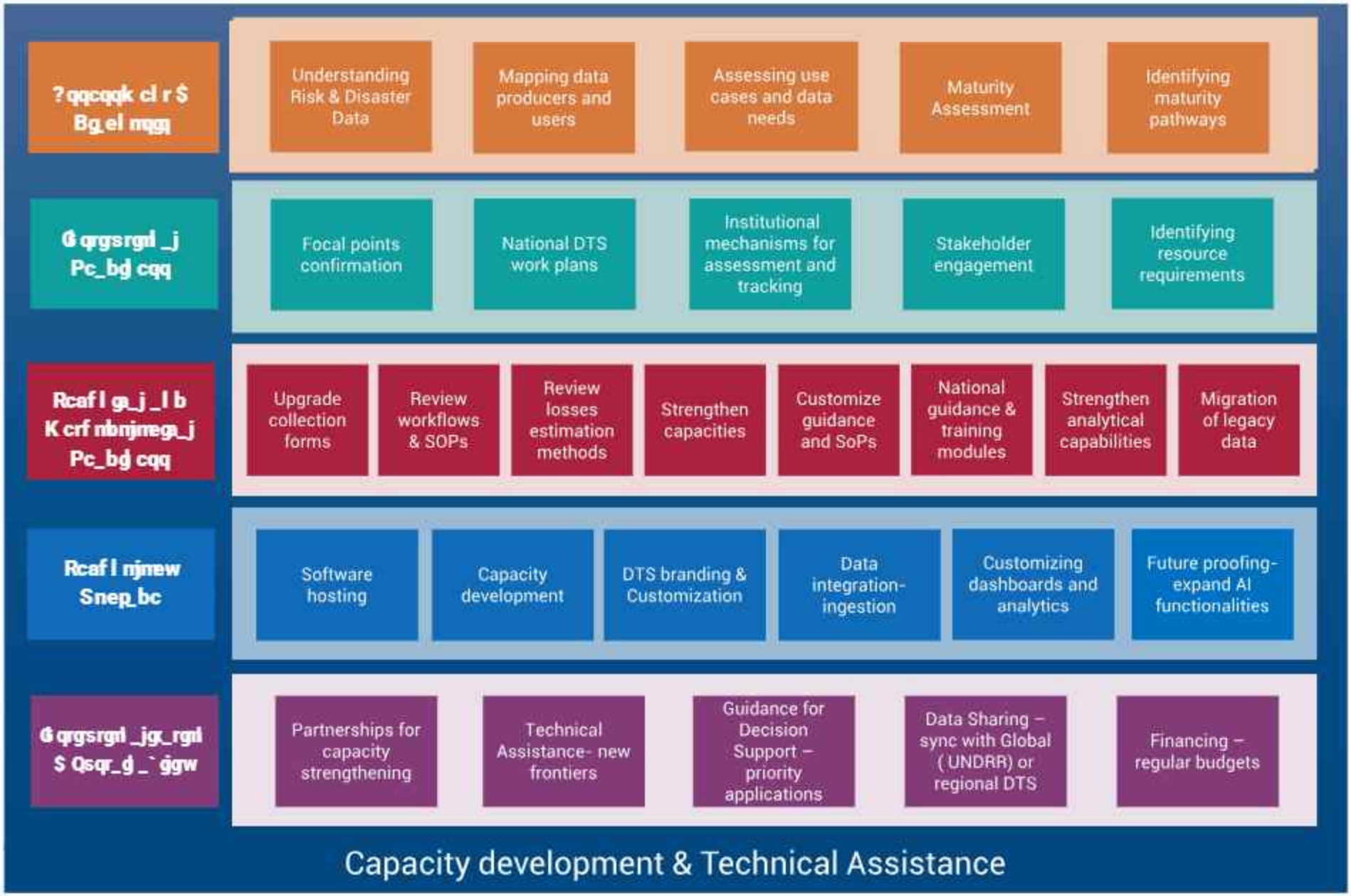
INSTITUTIONAL READINESS

TECHNICAL & METHODOLOG. READINESS

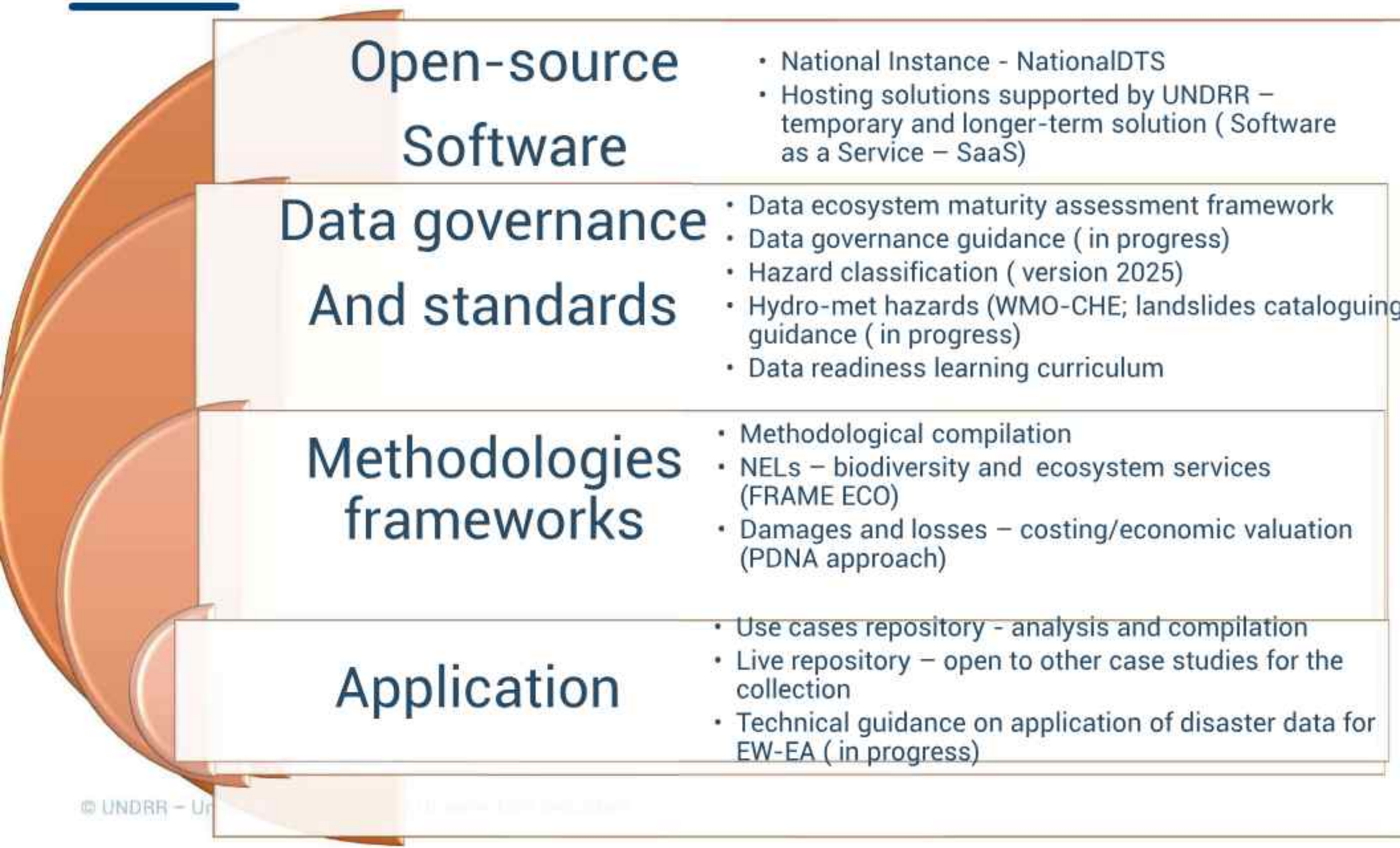
TECHNOLOGY UPGRADE

INSTITUTIONALIZATION & SUSTAINABILITY

Country DTS rollout work plan - key elements



Overview of DTS rollout materials

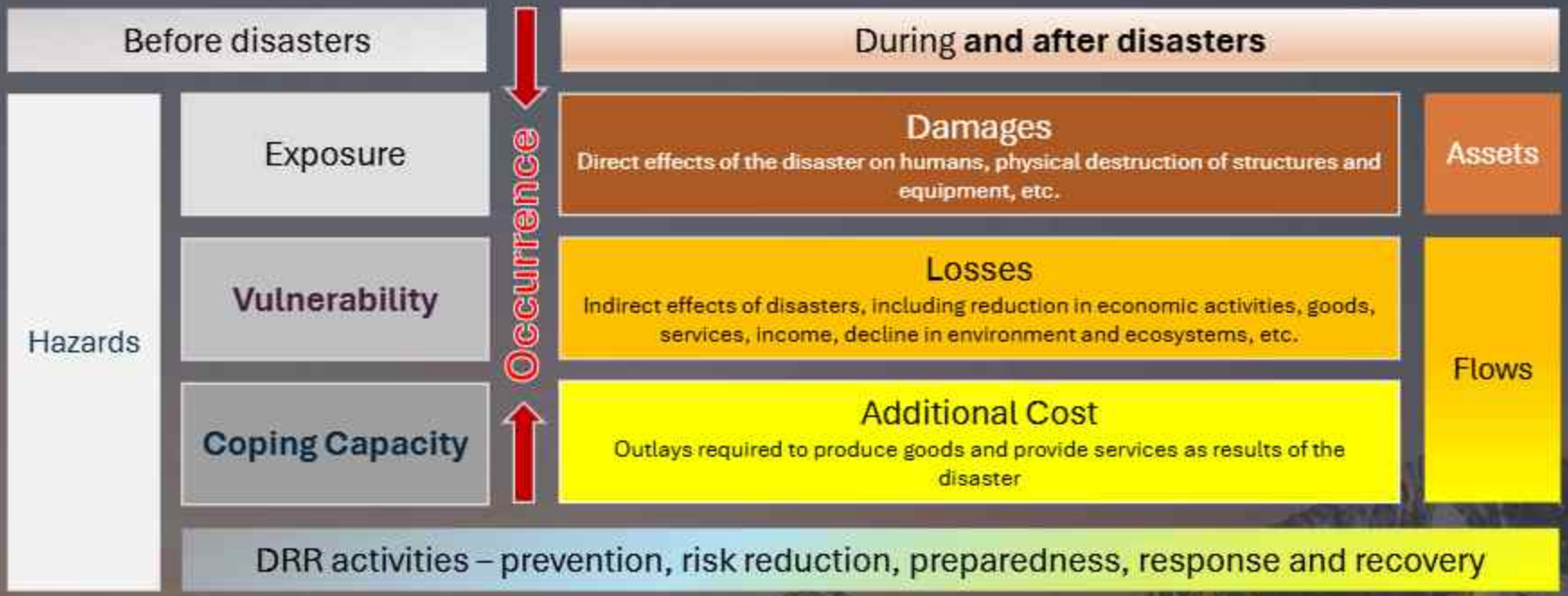


Disaster-related Statistics Global Common Framework (DRSF)

- **Aim:** Support the production of official statistics on disasters through **common references and guidance**.
- **Requires:** Collaboration among DRR entities & National Statistics Offices
- **Mandate** from the UN Statistical Commission to the IAEG-DRS.
- **Encompass**: conceptual framework, key definitions, plus metrics on:
  1) exposure, vulnerability, capacity;
  2) **disaster impact statistics,**
  3) DRR expenditure accounting.
- **Process:** IAEG-DRS mandated to draft in consultation with experts. Ongoing review, global consultations planned for Summer 2025.
- **Milestones:** Annual Global Expert Forum on Producers and Users of Disaster-related Statistics: Upcoming in **October 2025** - Fully Virtual.

Scan to learn more

Disaster-related Statistics Conceptual Framework



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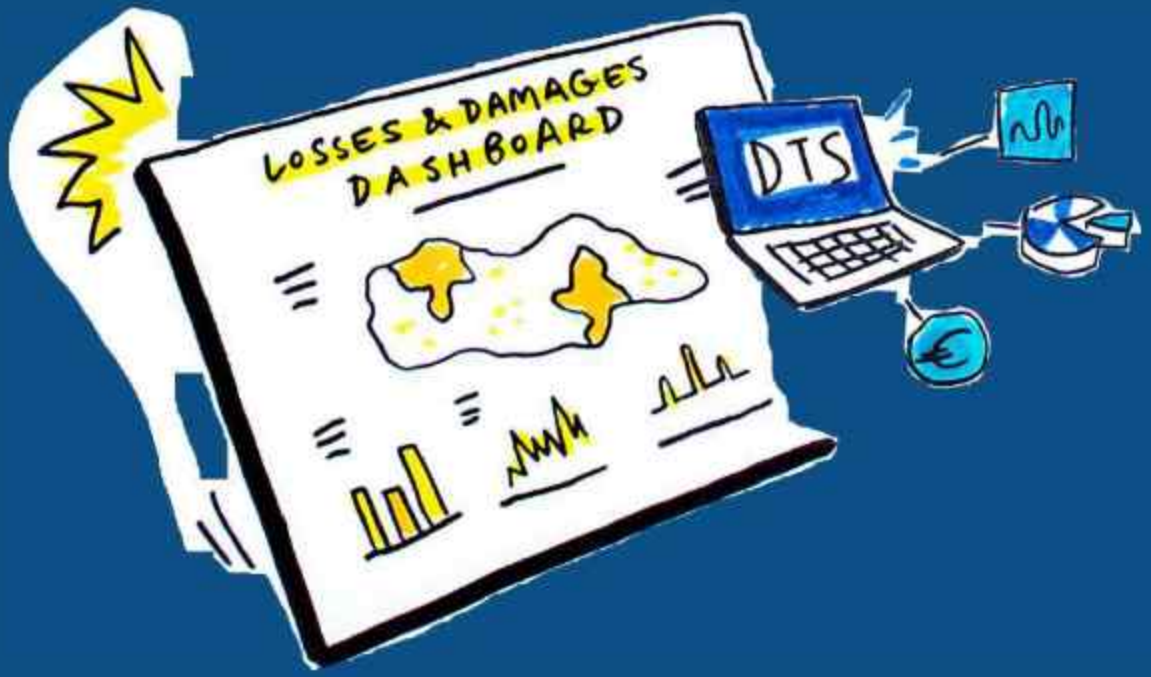

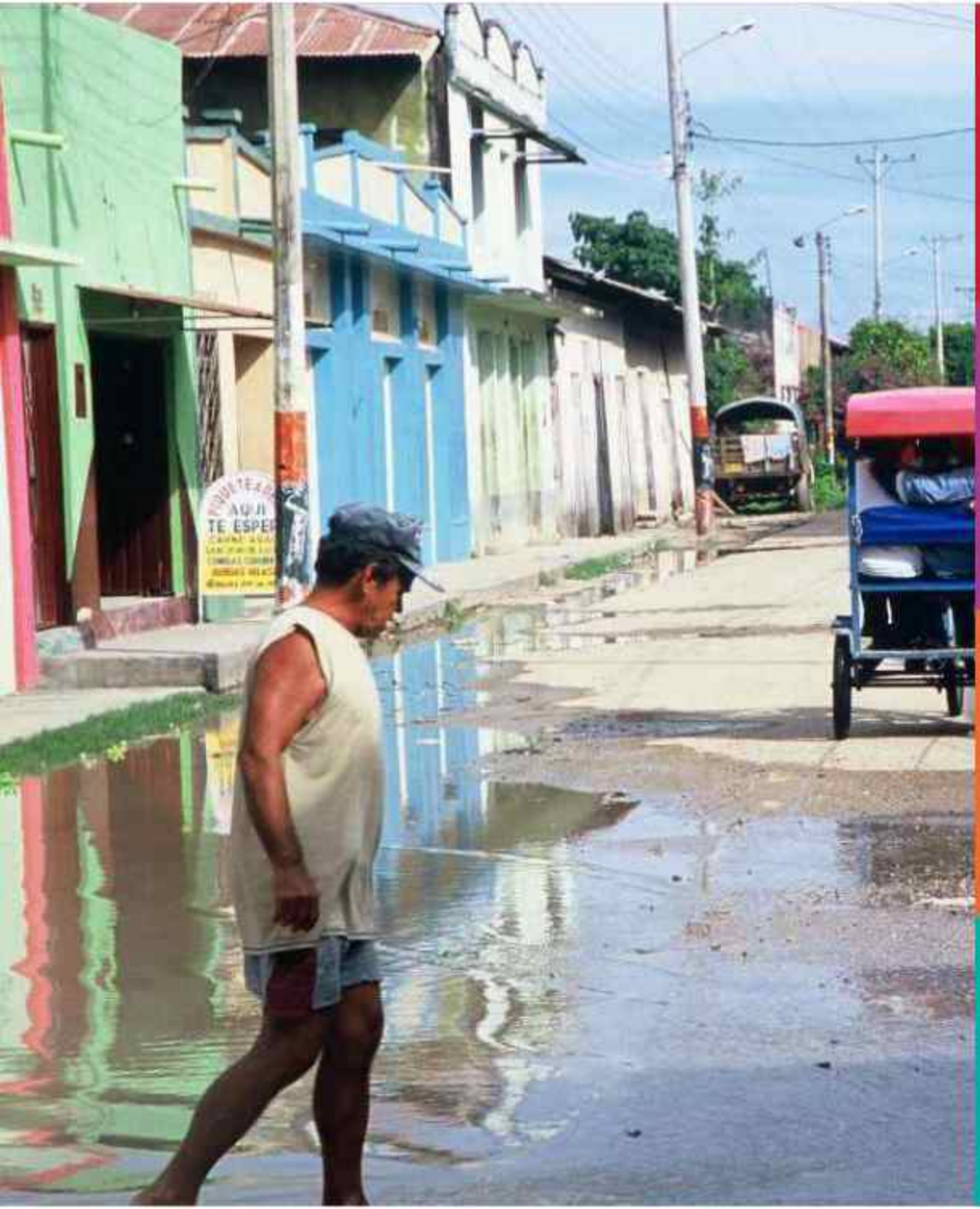

DTS software overview

Disaster Tracking System software tool

(open-source Beta version)

Undrr.org/L-Dtracking

Open Source DTS – hosting options

Government decision informed by maturity assessment

Ansl rpwqcjdkk _l _ecb f nqrg e

Your cloud server provider

On-premises server

SL BPP+k _l _ecb f nqrg e

Current Offer (2025)
UNDRR managed virtual machine (UNOG Server)

- Country XXX Database
- URL (sample)
- dts-[iso3/name].undrr.org

Future Offer (2026)
UNDRR shared countries instance (Software as a service)

- UNDRR managed instances for Countries (SaaS service)
  URL: dts-shared.undrr.org

Practical implications

- Government entity responsible to manage IT side – application installation, updates, cybersecurity
- Country chosen URL

Practical implications

- Server and IT infrastructure managed by UNDRR
- Country database admin receive username & password

Requirements for self-hosting the DTS

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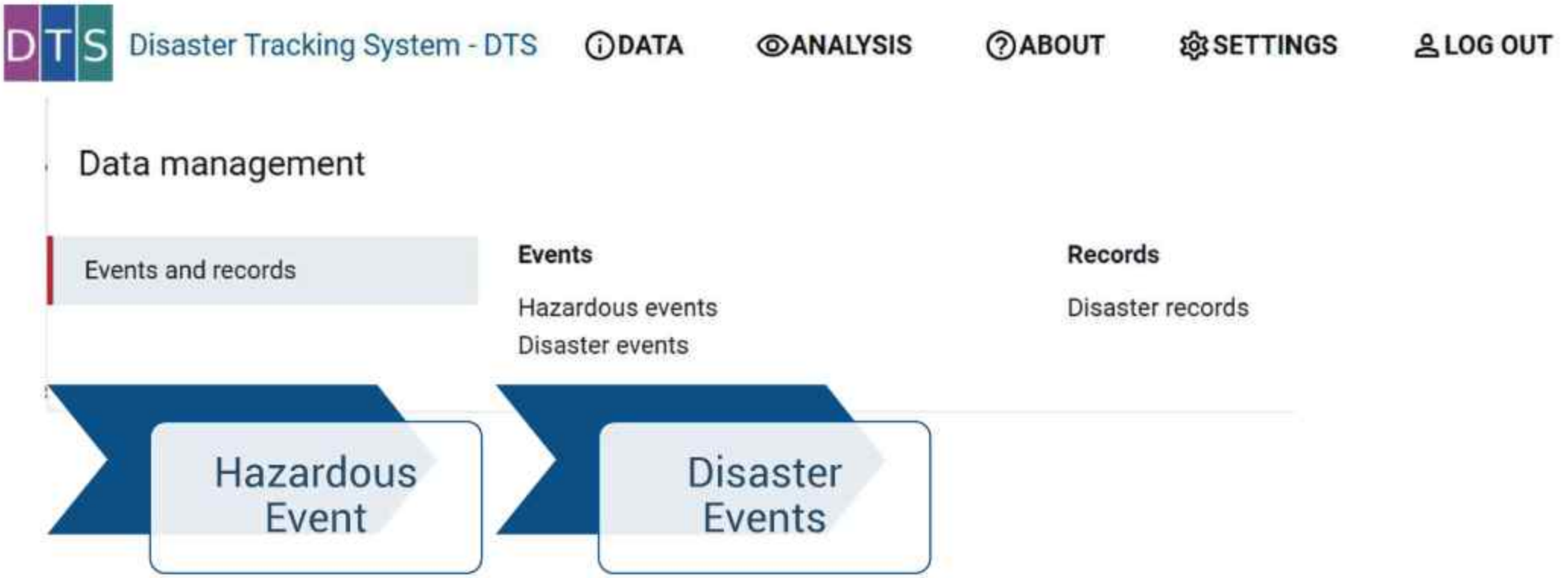
- Minimum Requirement
  - Processor: Quad-core CPU
  - Memory (RAM): 8GB
  - Storage: 50GB SSD free disk space
- Recommended Requirement
  - Processor: Intel i5/i7 or AMD Ryzen 5/7
  - Memory (RAM): 16GB for better
  - performance
  - Storage: 50GB NVME free disk space

Qndru_pc

- Operating System:
  - Linux: Ubuntu Server 20.04+, CentOS 7+, Debian 10+
  - Windows Server: Windows Server 2019+ (with WSL2 for Linux compatibility)
- Database: PostgreSQL 16 with PostGIS extension.
- Node.js version 22
- SMTP email relay
- Domain/sub name & SSL certificate

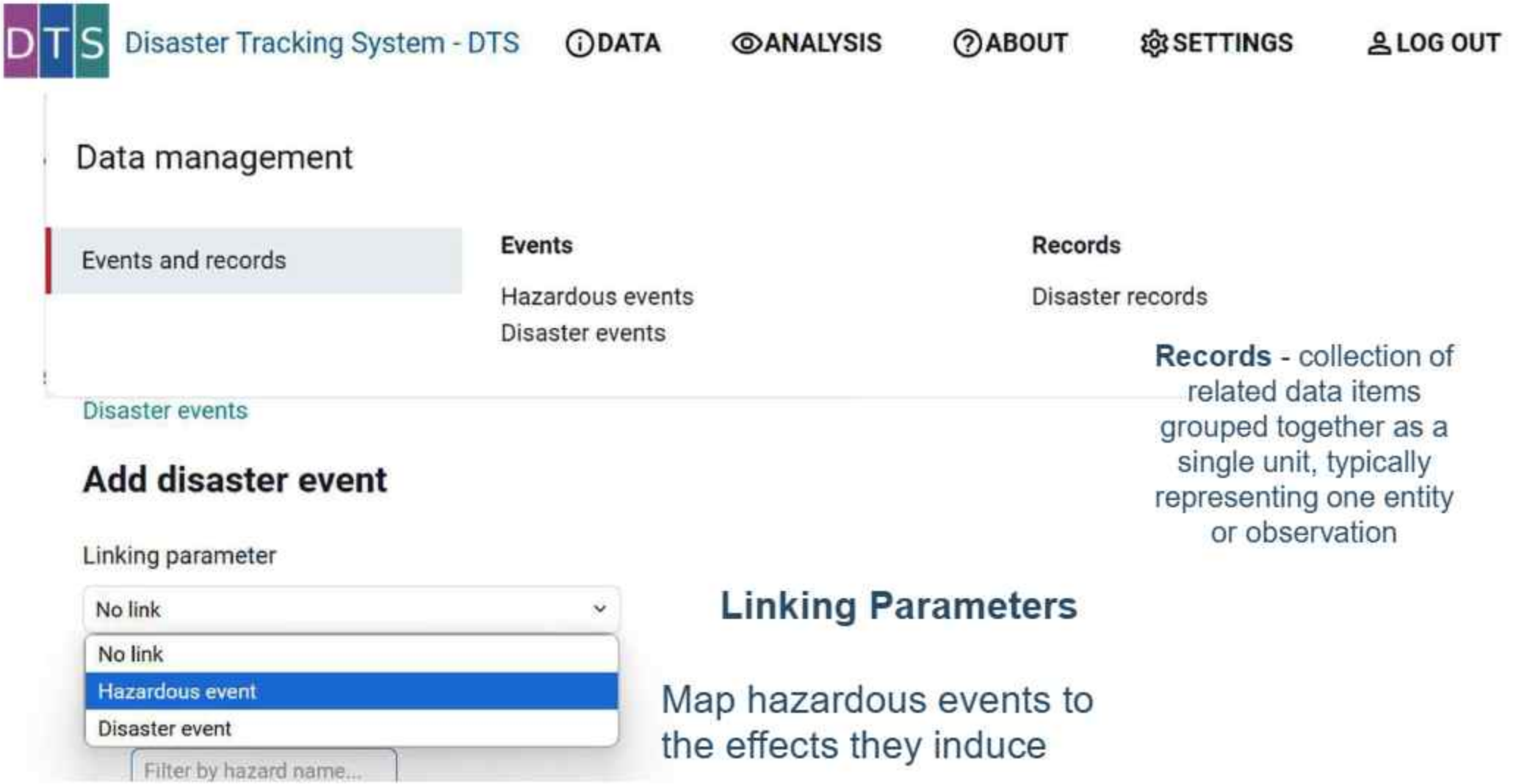
Data Entry/Collection



Hazardous event: the manifestation of a hazard in a specific location during a specific period of time.
A **process, phenomenon or human activity** that may cause harm

Disaster event: a serious **disruption** of a community or society's functioning due to hazardous events interacting with exposure, vulnerability, and capacity, leading to losses and impacts

Data Entry/Collection (continued)

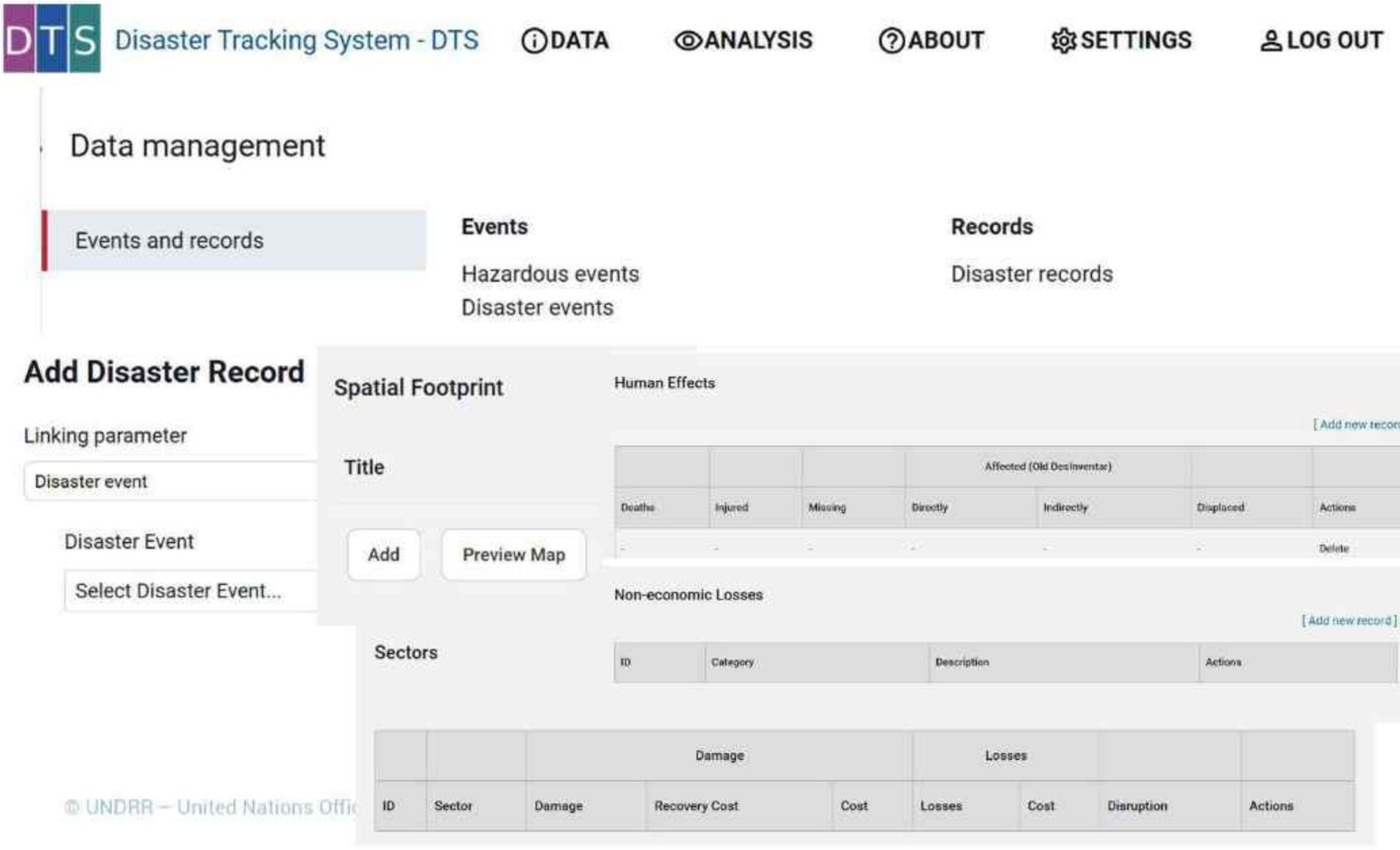


Records - collection of related data items grouped together as a single unit, typically representing one entity or observation

Linking Parameters

Map hazardous events to the effects they induce

Data Entry/Collection (continued)



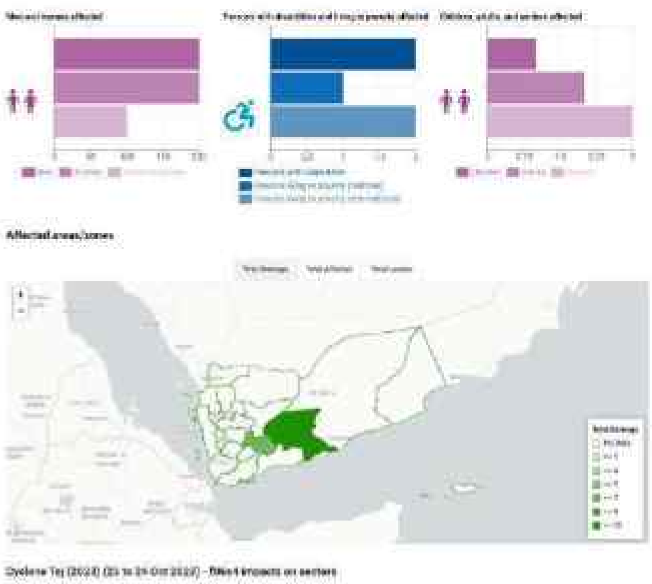
Data Analysis/ Visualization (Dashboards)

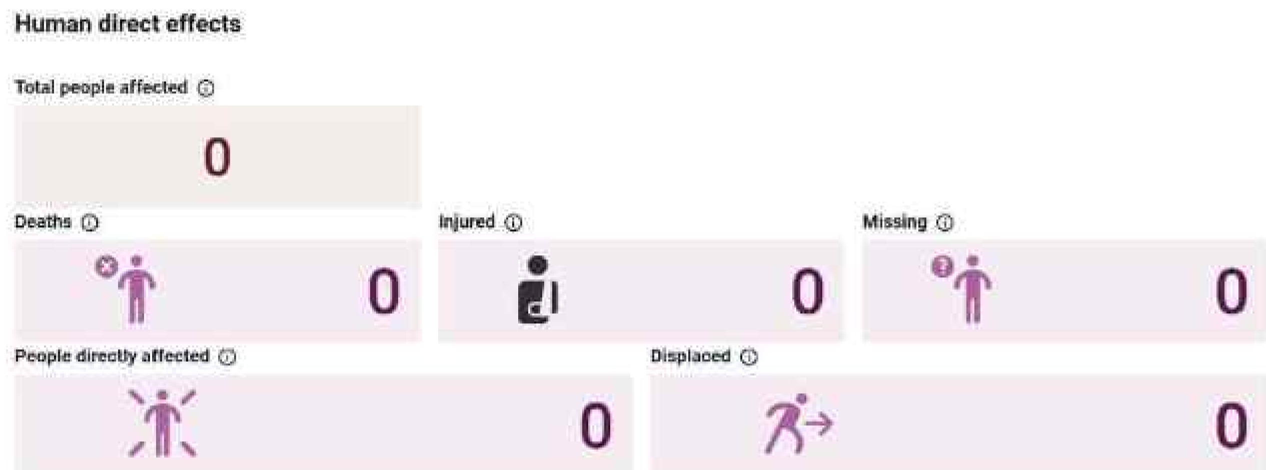
DTS Disaster Tracking System - DTS

DATA ANALYSIS ABOUT SETTINGS LOG OUT

Visualize results of queries based on 3 entry points:

- Per hazard (e.g. droughts, floods)
- Per sector (e.g. agriculture, infrastructure)
- Per disaster event (e.g. cyclone XXX, droughts xxx)





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