Data and Digital Technologies for DRR and Climate Action

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The Sendai Framework for Disaster Risk Reduction 2015-2030

Sendai Framework
for Disaster Risk Reduction
2015 - 2030

- **Adopted** at the **Third UN World Conference on Disaster Risk Reduction** (March 18, 2015) and **endorsed** by the **UN General Assembly** (May 15, 2015)
- **A shift from managing disasters to managing risks**
- It focuses not only on reducing existing risks but **also on preventing the creation of new risks and strengthening resilience**

Sendai Framework Priorities

- **Priority 1**: Understanding disaster risk.
- **Priority 2:** Strengthening disaster risk governance to manage disaster risk.
- **Priority 3:** Investing in disaster risk reduction for resilience.
- **Priority 4:** Enhancing disaster preparedness for effective response, and to “Build back better” in recovery, rehabilitation and reconstruction.

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7 Global targets



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The Sendai Framework for DRR and the Role of Technology

- SFDRR underscores the indispensable role of technology in mitigating disaster risks and enhancing community resilience.
- SFDRR calls for leveraging advanced technologies to improve multi-hazard early warning systems, disaster response mechanisms and comprehensive risk assessments.
- These technological advancements are critical to achieving the framework's goals, which include reducing disaster impacts on livelihoods, health and well-being, as well as damage to critical infrastructure and services.

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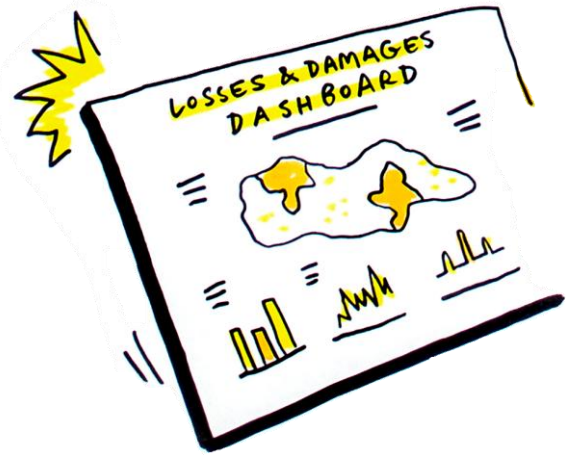
Why we need data?

We cannot manage what we cannot measure

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Introducing the Disaster Tracking System (DTS)

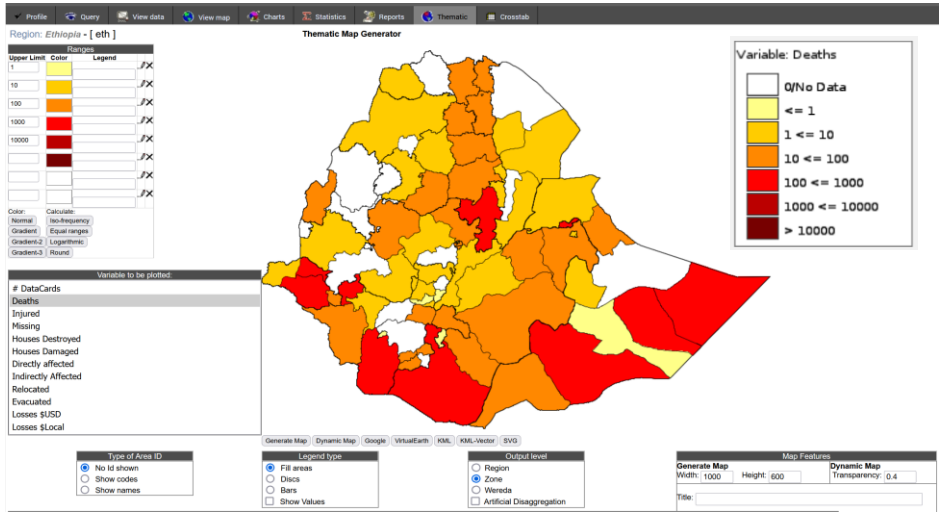


desinventar

Disaster Information Management System

desinventar.net

113 countries with sub-nationally disaggregated disaster losses and damages databases since 1994.



Composition of Disasters get it as Excel

Event	DataCards	Deaths	Injured	Missing	Houses Destroyed	Houses Damaged	Indirectly Affected	Directly affected	Relocated	Evacuated	Losses $USD	Losses $Local	Education centers	Hospitals	Damages in crops Ha.	Lost Cattle	Damages in roads Mts
Building slide	1						3										
CONFLICT	356	1650	3455	210	300418	19253	775786		659448						10912	759	
Covid-19	1		4														
DROUGHT	3995	3920				10	76642721		637						354725	2553647	
EARTHQUAKE	6	5	7		12		19544									1369	
FIRE	797	854	872		3668	1613	76717		5259						195560	1138	
FLOOD	1449	3303	23343		21681	8970	10359967		1359513			2429535	8	1	548725	357974	
FOREST FIRE	31	4			905		750660		2230						100084	11	
FROST	7						7560								10372		
HAILSTORM	250	67	11		1347	14	287623		39121						84445	3523	
HEAT WAVE	2						8										
Land slide	211	461	2745		1556	711	96871		133209						13715	1143	
Livestock Disease Outbreak	147														1015	19228	
OTHER	137	446	1172				10004								2551066	35699	
PLAGUE	7467	196	22335				363355								5305852	293962	
RAIN	39	32					77895								2870	122	
SNOWSTORM	1						763										
STORM	5						3900								115	150	
THUNDERSTORM	32	47	17		13										10	217	
WINDSTORM	22	3			199		3473								600	13	

- **Comprehensive**: human, economic, housing and infrastructure losses at subnational levels
- **Nationally owned systems** (mostly): government definitions, no thresholds, data validated in country
- **Methodology and system**: homogeneous and customization (extension variables)
- **Analytics:** Overview profile, customized statistics, and downloadable reports, thematic maps and queries for further analyses
- **DesInventar Sendai**: since 2018, aligned with Sendai Framework indicators, enabling streamlined reporting on Sendai Framework Monitor and disaster-related SDGs

Key elements of the enhanced Disaster Tracking System

Data standards and assessment methods

Open-source software

Use cases Applications

Capacity development & technical assistance

Partnerships

Better data for insights for climate and disaster resilience building



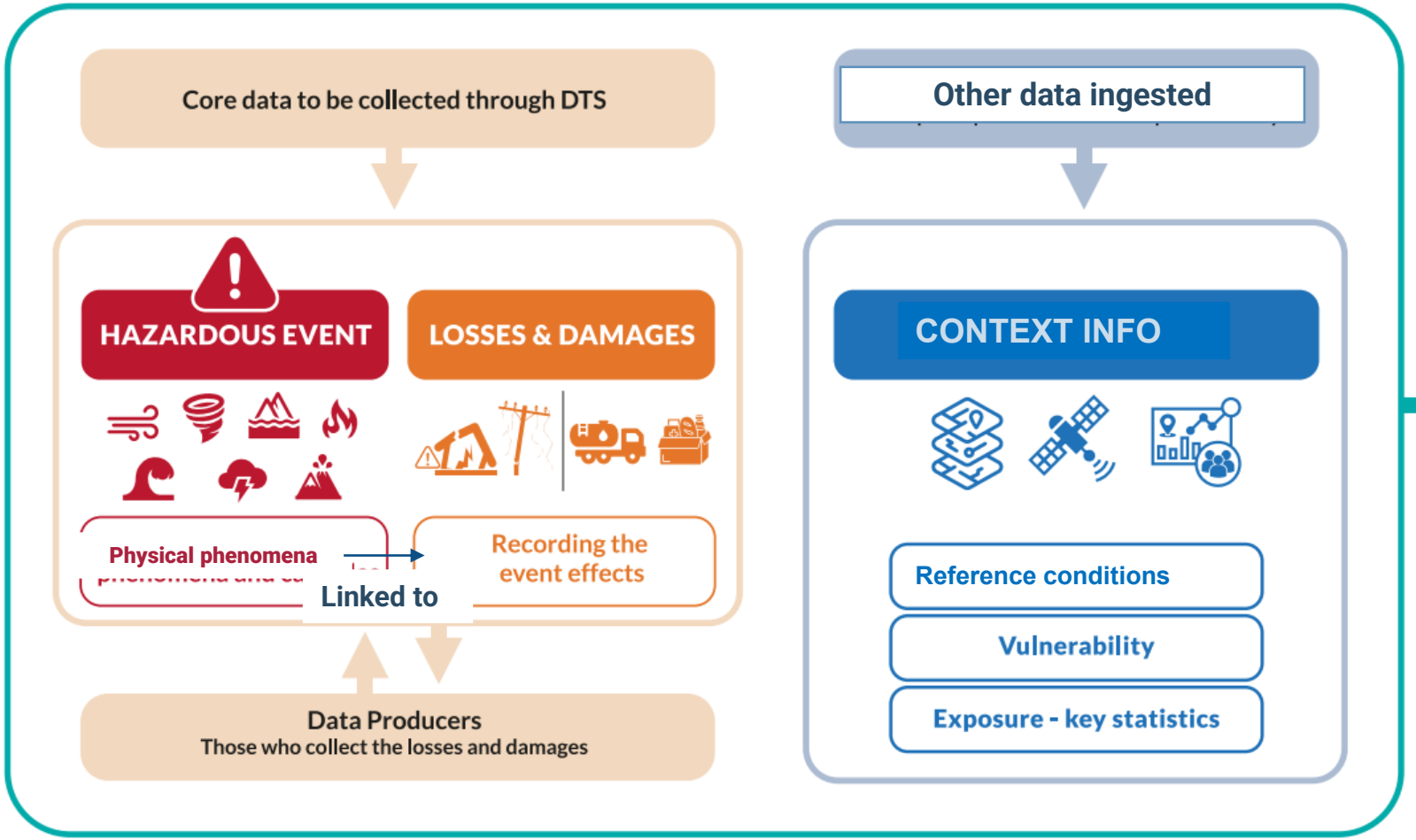
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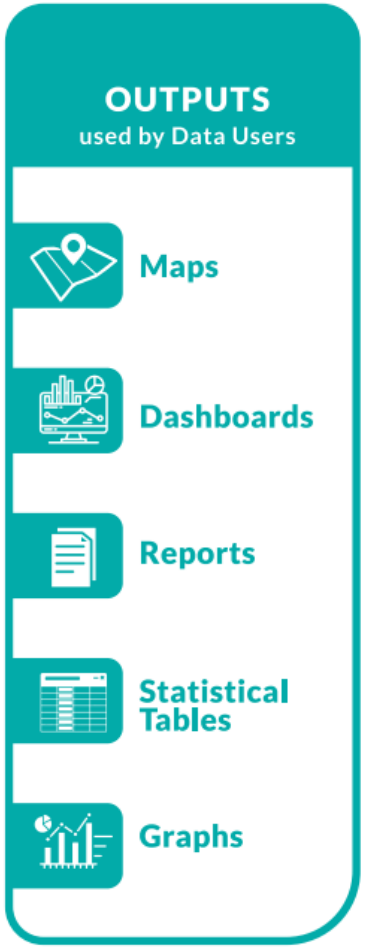
DATA ECOSYSTEM

(encompassing data producers, users and governance processes to collect and use the data)

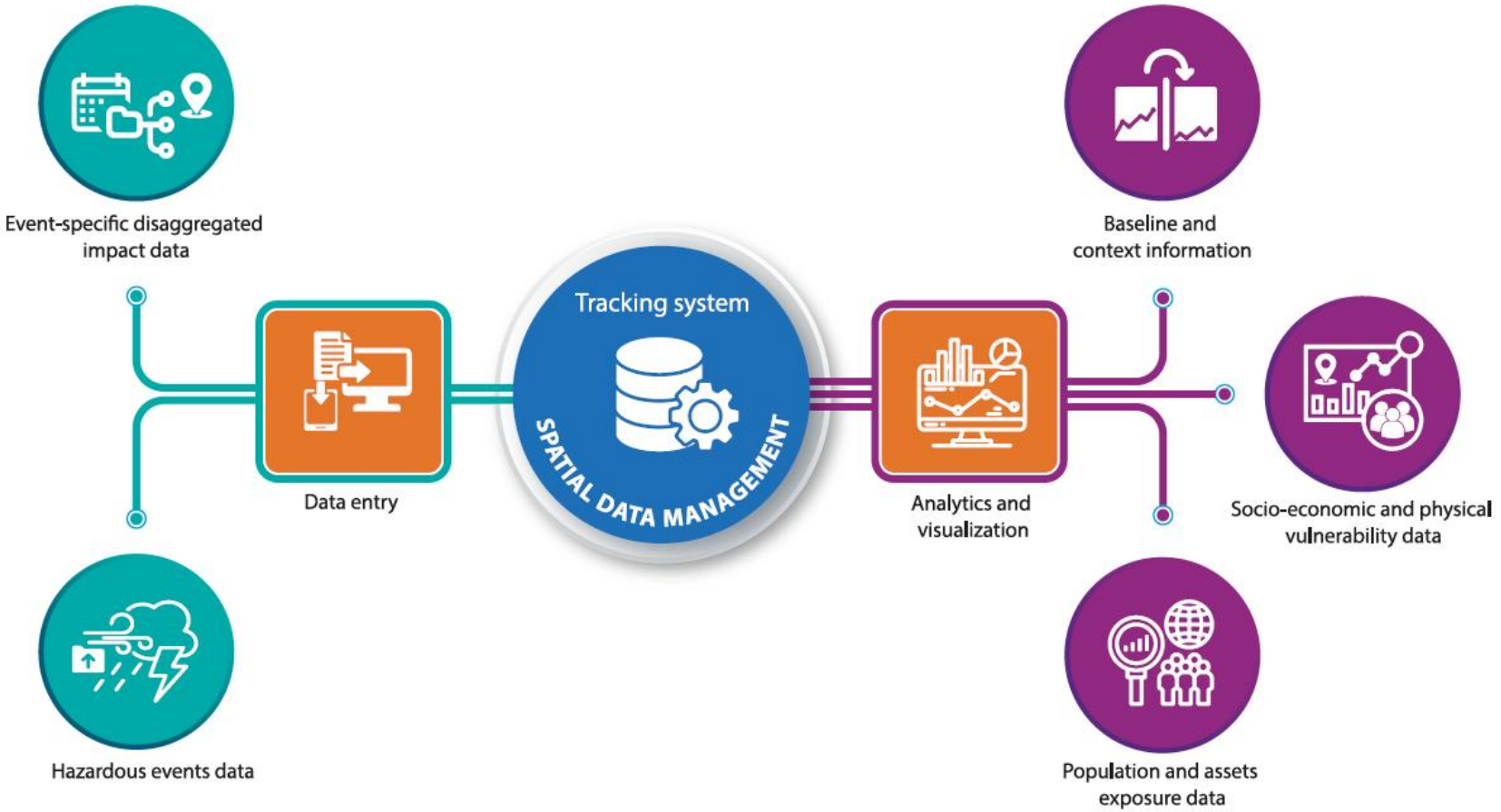
DTS Data Model

Core data elements



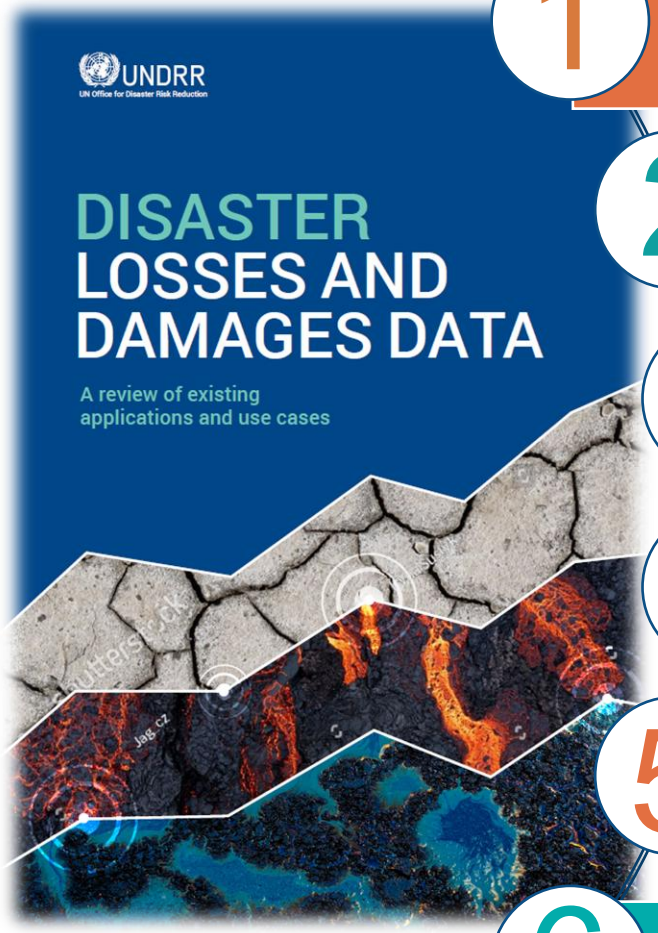


A software to support data management and analysis



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The applications and use cases of the disaster impact data

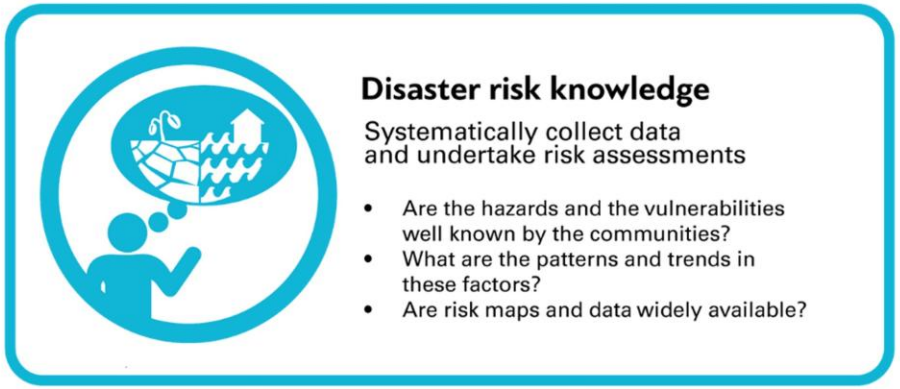


1. **Strengthening the understanding of vulnerabilities, impacts and hotspots of risks**
2. **Financing** : Assessing **losses and damages, DRR and adaptation financing**
3. **Risk-informing planning**: development and sectoral planning (e.g. infrastructure, agriculture, etc.), DRR & CCA plans
4. **Informing early warning systems** (impact-based forecasting), early action and preparedness
5. **Informing resilient recovery** - post-disaster needs assessments
6. **Benchmarking success and monitoring progress – Adaptation, Sendai/DRR, L&D/ BTR**

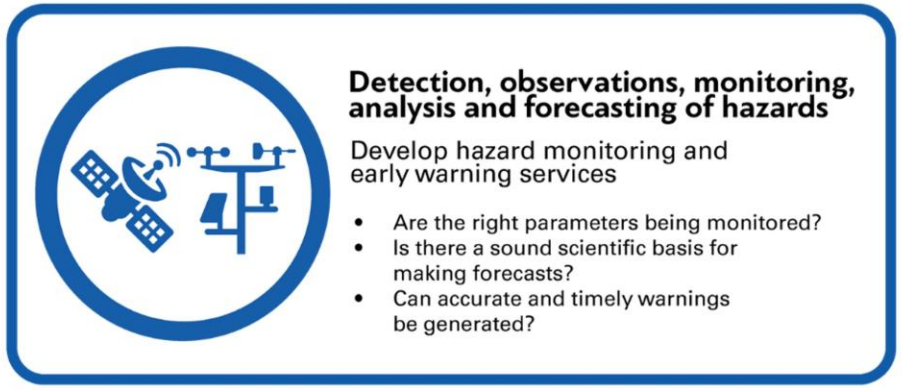
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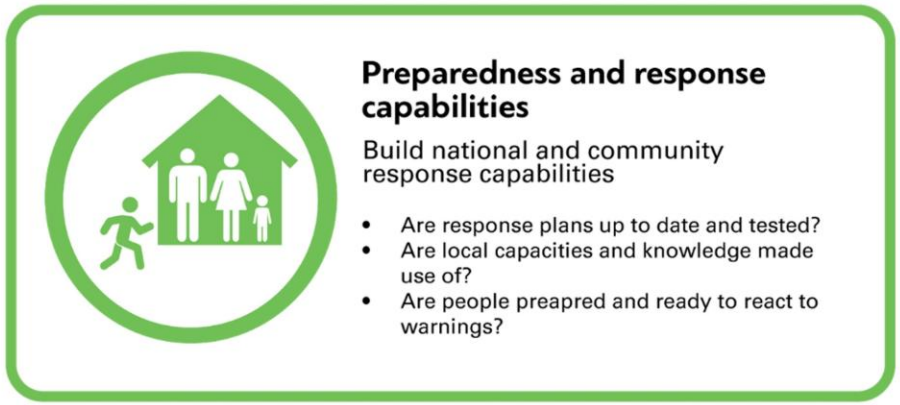
Early Warnings for All Initiative

Pillar 1 lead by UNDRR



Pillar 2 lead by WMO







Pillar 4 lead by IFRC

Pillar 3 lead by ITU

Early Warnings for All

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Digital Technology in EW4All

- **Data Integration & Risk Knowledge** – geospatial mapping, big data, drones
- **Communication Tools** – Common Alerting Protocol (CAP), connectivity maps
- **Youth & Community Engagement** – local innovation hubs, digital literacy

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Artificial Intelligence in EW4All

- **Forecasting & Monitoring** – AI improves accuracy of hazard prediction models
- **Decision Support** – rapid analysis of complex datasets for early action
- **Targeted Warnings** – tailoring alerts to vulnerable groups (women, elderly, disabled, etc.)

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Impact of AI & Digital Technology in EW4All

- Faster & More Accurate Warnings → saves lives
- Inclusive & Accessible Communication → no one left behind
- Empowered Local Capacity → communities become innovators, not just recipients

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Tech4DRR report



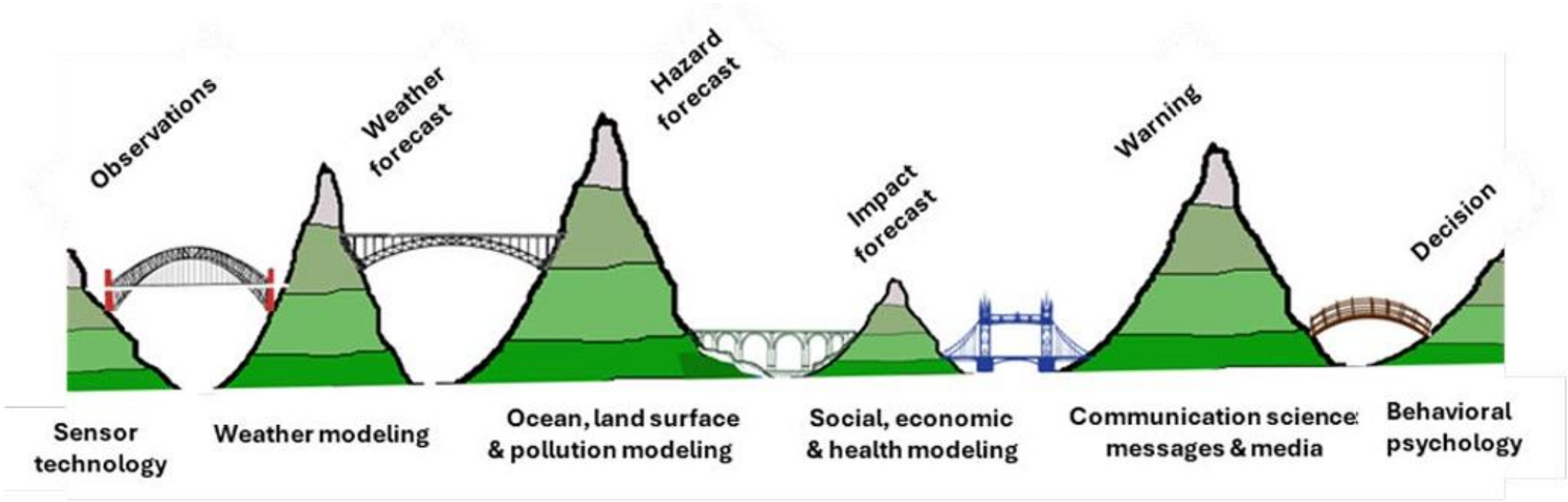
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How AI and ML tools impacting DRR

- Data detection and searches
- Real-time data processing
- Simulations and risk modelling
- Forecasting and preparedness
- Resource optimization and automated response

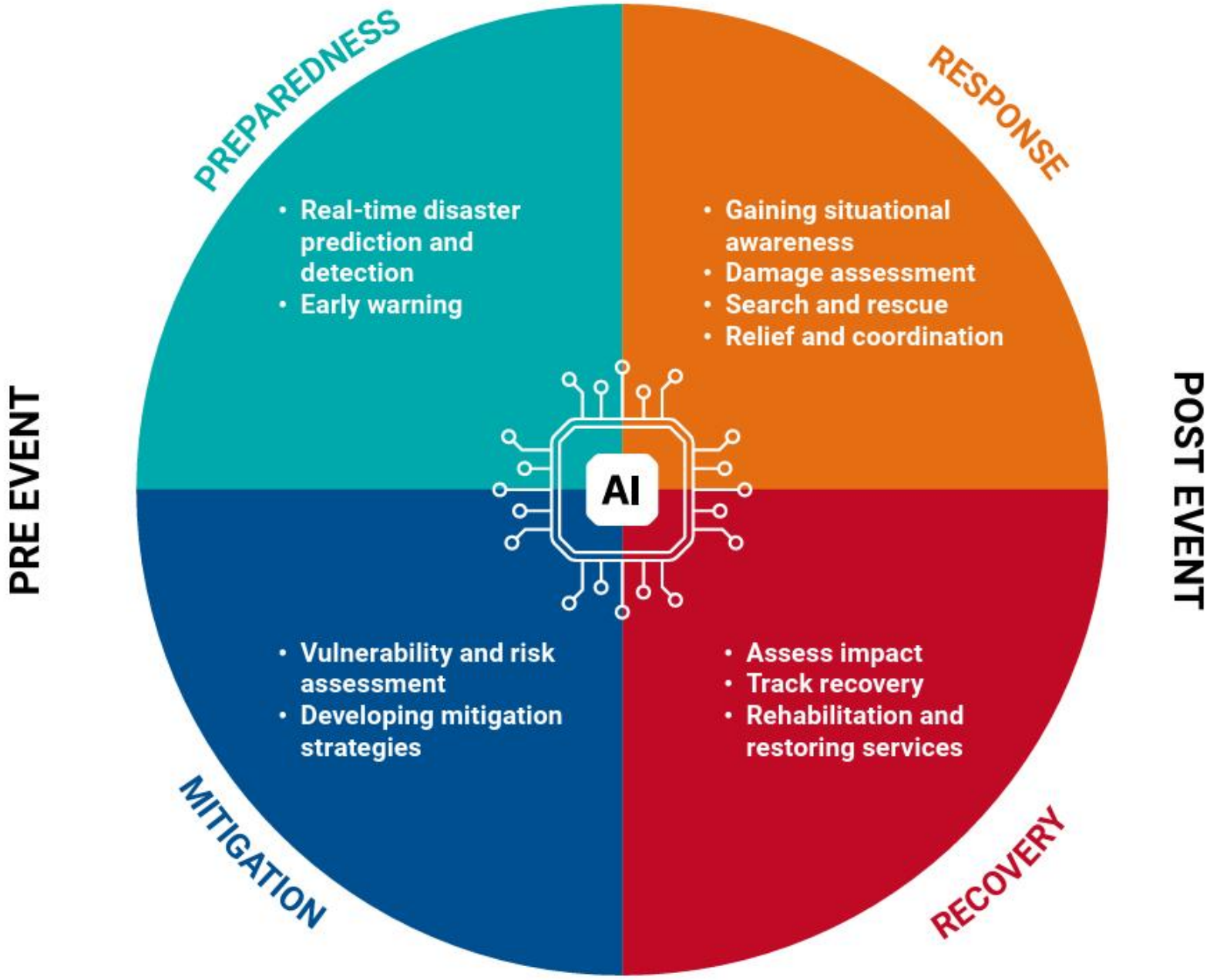
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Value chain framework in systems thinking for technology evaluation and adoption in disaster risk reduction



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Examples of applications of AI in DRR



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