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Goals:

1. Show how AI can be used in DRM,



2. Introduce key concepts, &



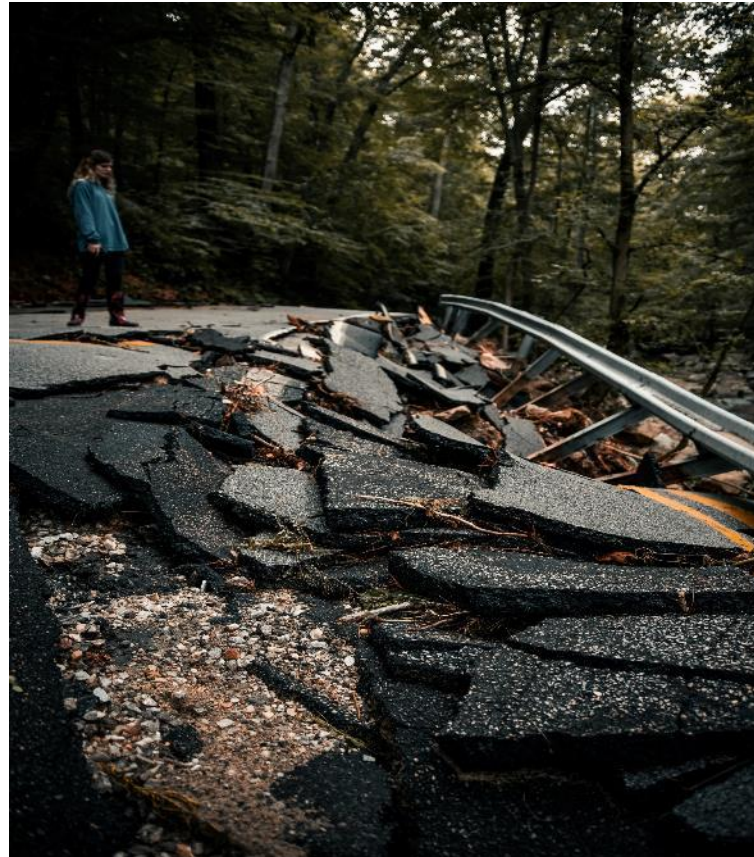
3. Bridge innovation with operation
through international standards.



unesco

Innovative solutions for Disaster Risk Reduction

Disaster Risk Reduction Unit



UNESCO DRR 8 Thematic Areas

UNESCO operates at the interface of several disciplines, including natural and social sciences, education, culture, communication, and information. To address hazards in a comprehensive manner, UNESCO adopts a **multi-hazard, multi-disciplinary and multi-stakeholder participatory approach**.

UNESCO's priority areas are:

Africa



Gender



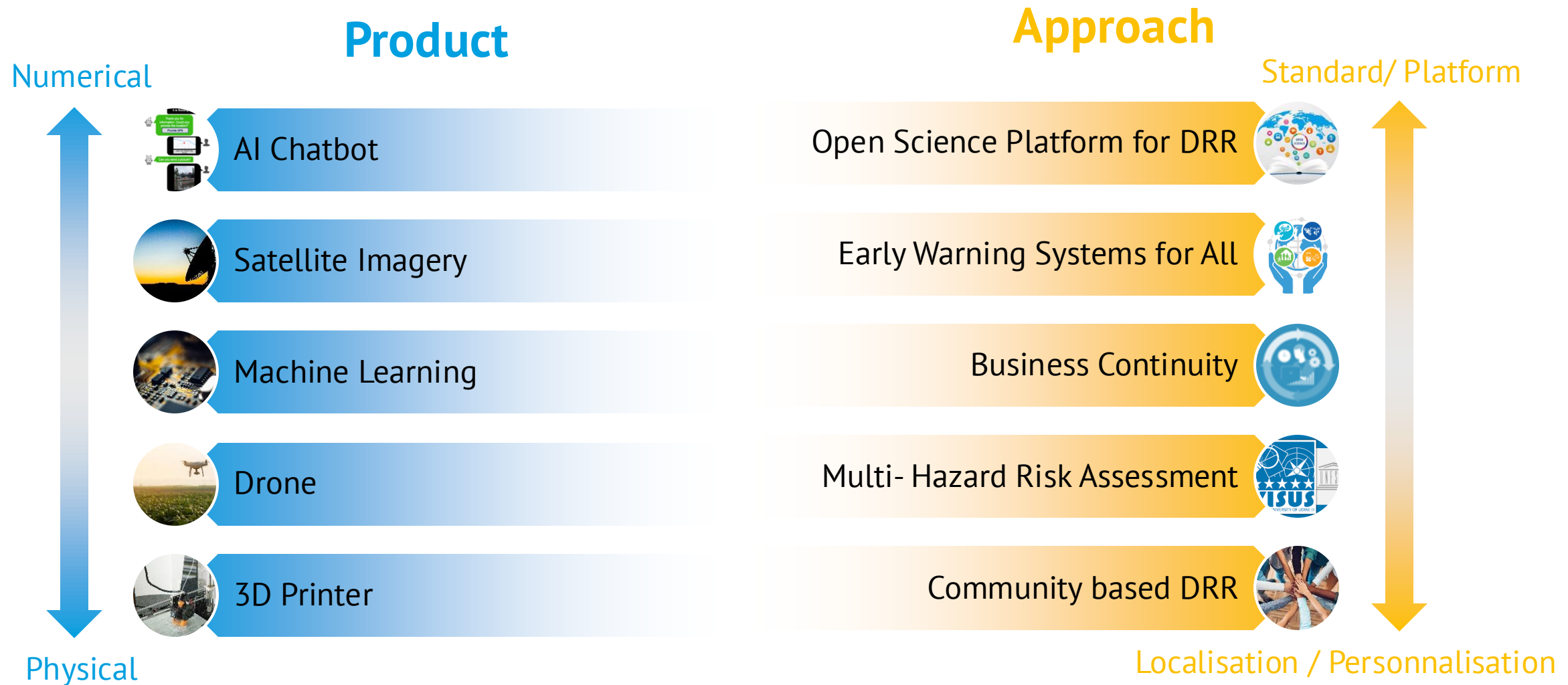
SIDS



Youth



Mapping of Innovative solutions for DRR



AI for efficient risk communication

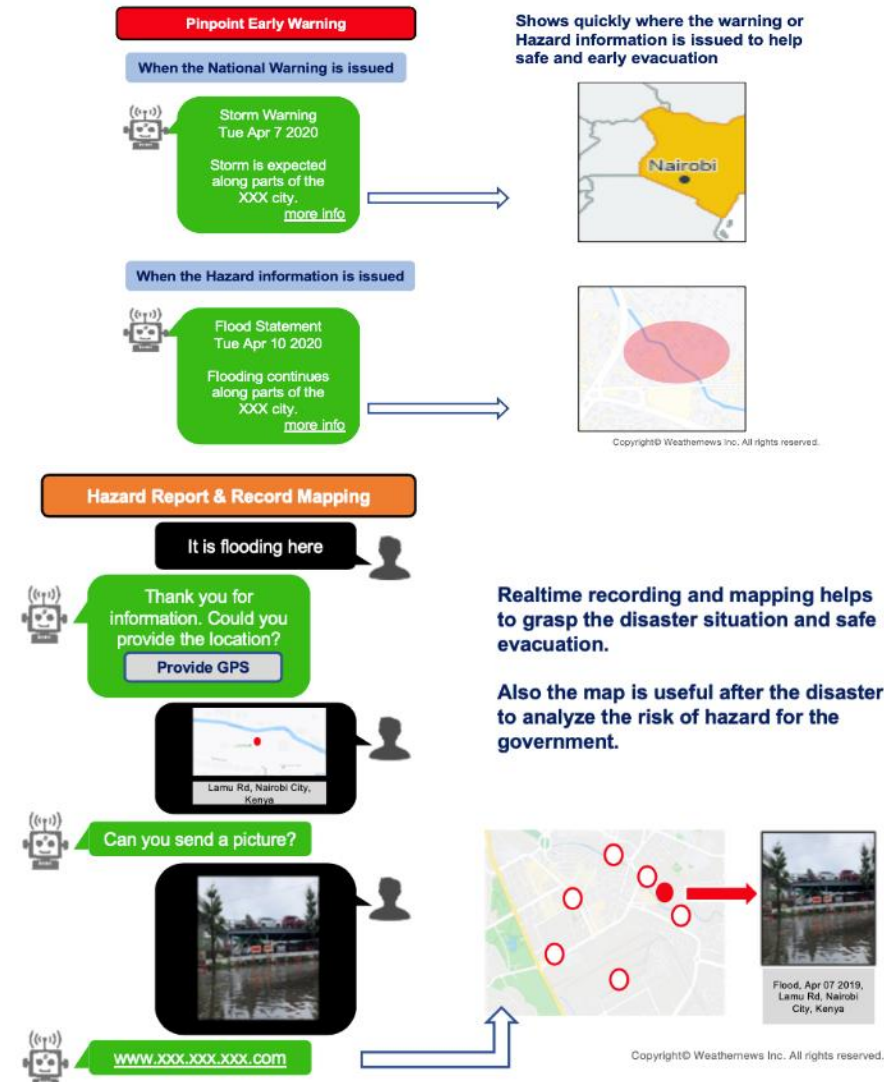
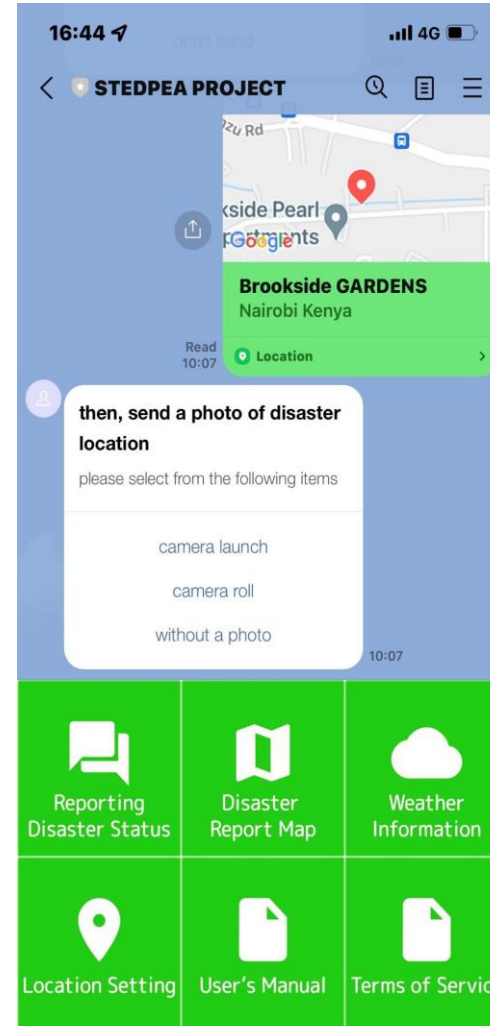
Strengthening Disaster Prevention Approaches– STEDPEA

AI Chatbot (Mobile Applications)

In 5 countries (Kenya, Rwanda, South Sudan, Tanzania and Uganda)

AI chatbot enable sharing information on disasters and connecting communities to expedite relief efforts during disasters.

- **Optimize the communication** between government and citizen
- **Share the information** of supplies and evacuation immediately
- **Grasp the situation** of damage/recovery accurately for both side



Minimize education disruption with AI (Agent-based model)

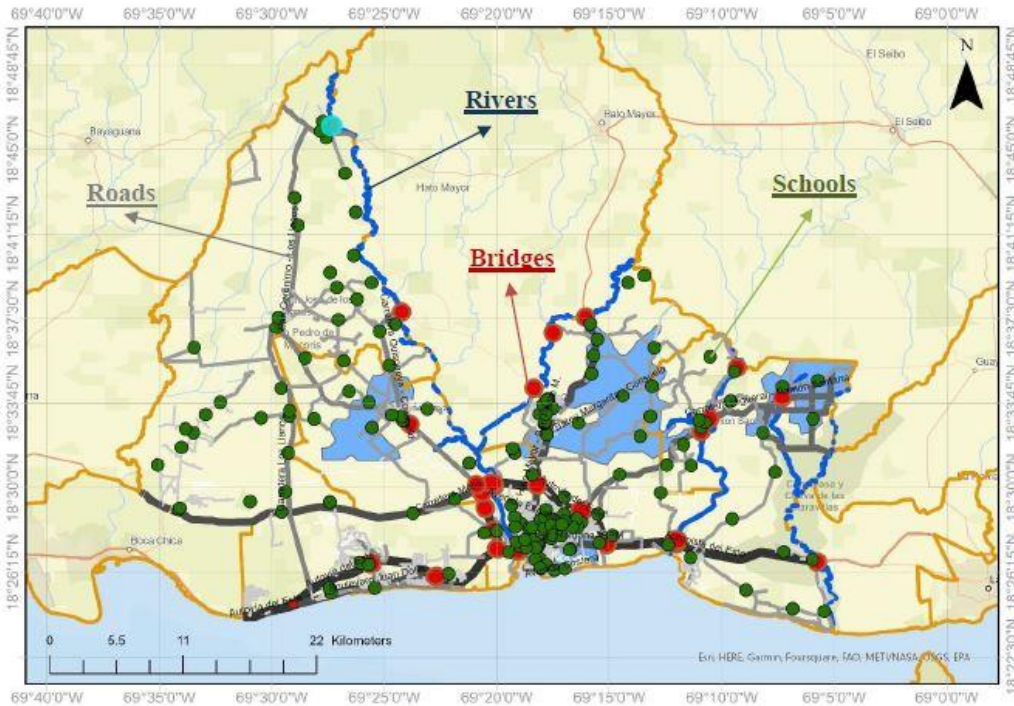


Figure shows the exposed assets in the San Pedro de Marcos city with 288 schools with 80,000 students. There are 46 bridges in the city.

There are 78 shelters in the Dominican Republic with a total capacity of around 15,000 to be used in emergencies.

- The Agent-based model was developed and employed to track the functionality recovery of the integrated School-Road Networks, under individual and sequential effects of multiple hazards
- The project was funded by Japan from 2022-2023

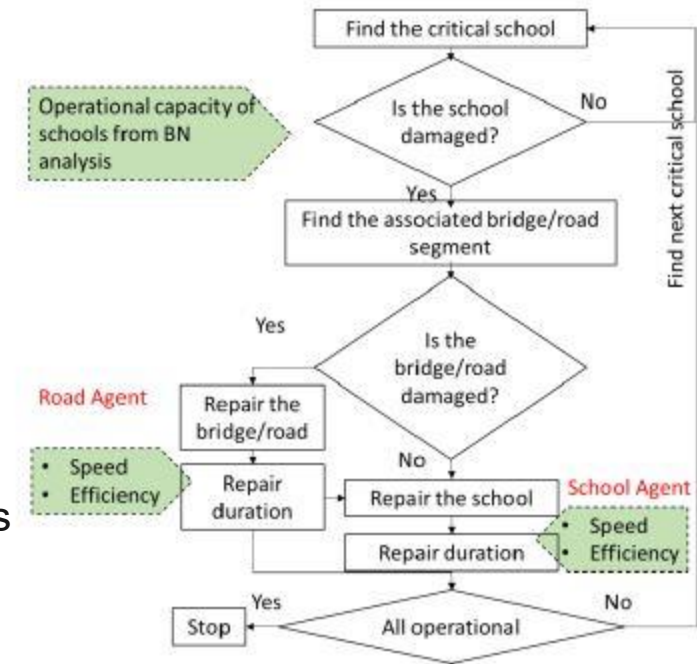


Figure models the interactive decision-makings between various stakeholders of the system, such as the Operators of the Road Network and School Network, which will be modelled as the Agents.

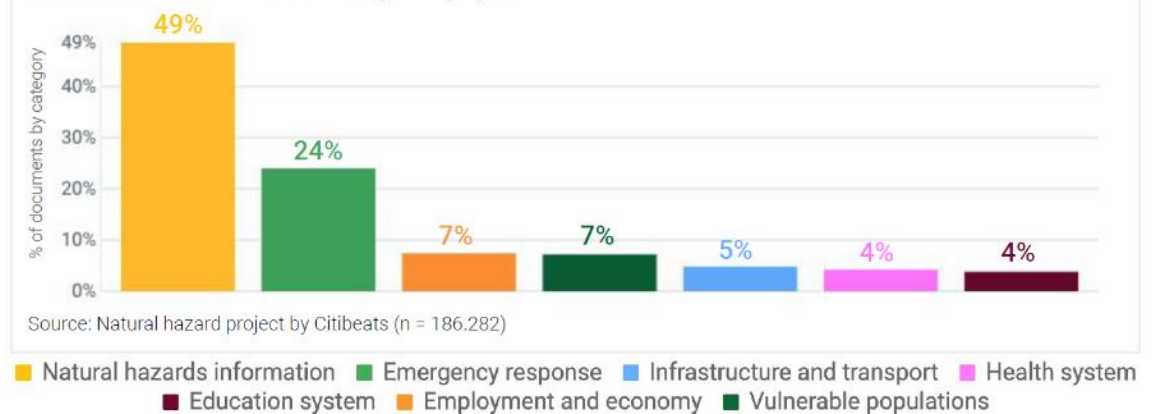
Social media analysis using AI

- **Artificial intelligence is used to identify how people's needs and concerns change before/during/after a natural hazard from the social media**
 - ✓ Citizens' opinions were collected in **5 countries** (Kenya, Rwanda, South Sudan, Tanzania and Uganda) from social media before/after 2 weeks.
 - ✓ The collected data was categorized into **7 categories** by AI.
 - ✓ The data was analyzed by AI to better understand the people's needs for decision maker.



Natural hazards information and emergency response are the main categories in the general conversation

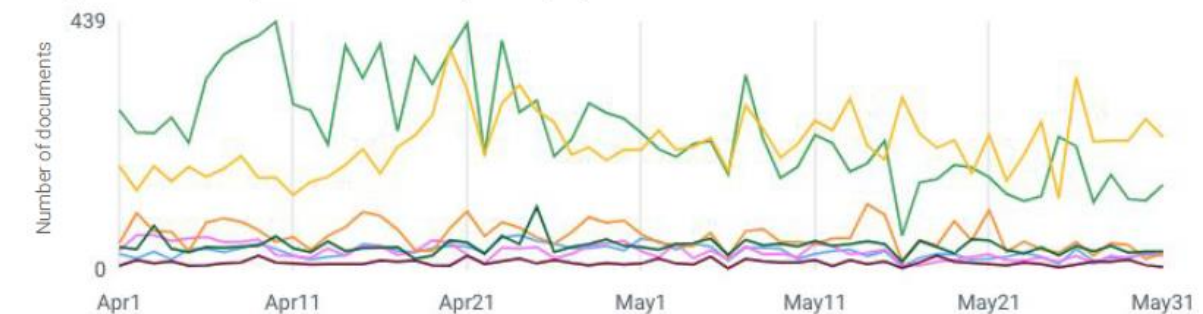
Distribution of the conversation by category in %



Evolution of the conversation in Kenya from April 1st to May 31st of 2020

Daily evolution of the conversation by category

(Floods and landslides in Kenya)

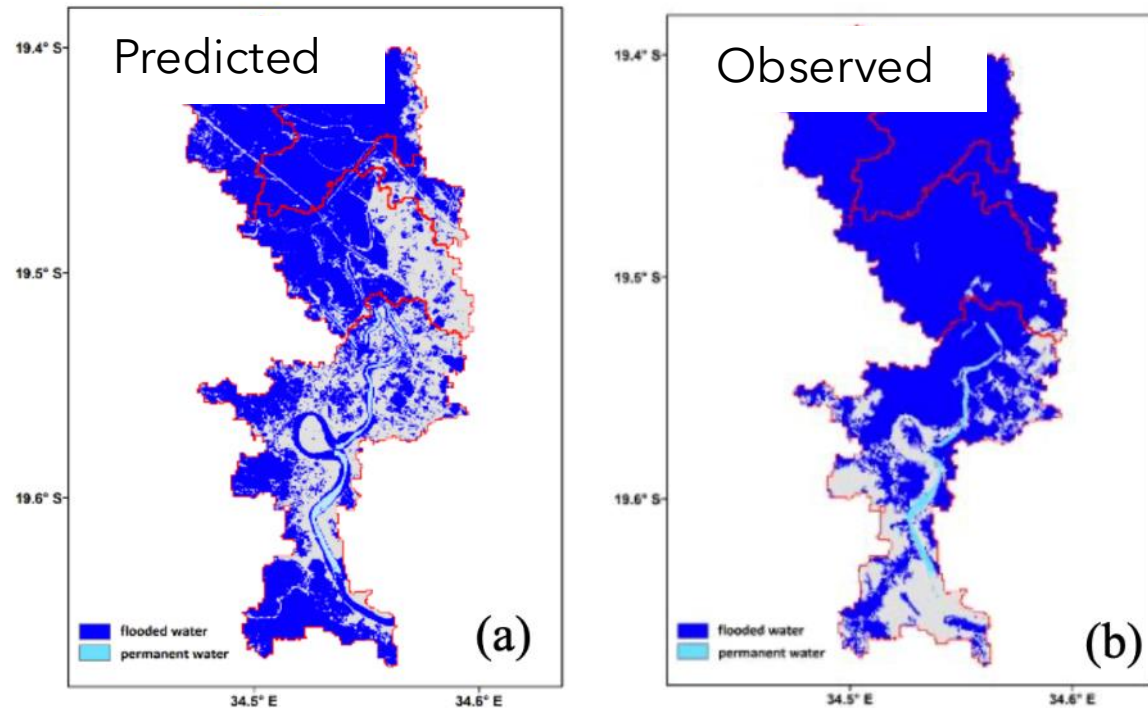


Source: Natural hazard project by Citibeats (n = 39.895)

Change of people's concern among 7 categories

AI predicts upcoming floods

- Artificial intelligence is used to predict areas with a high probability of flooding in the next 24 hours.

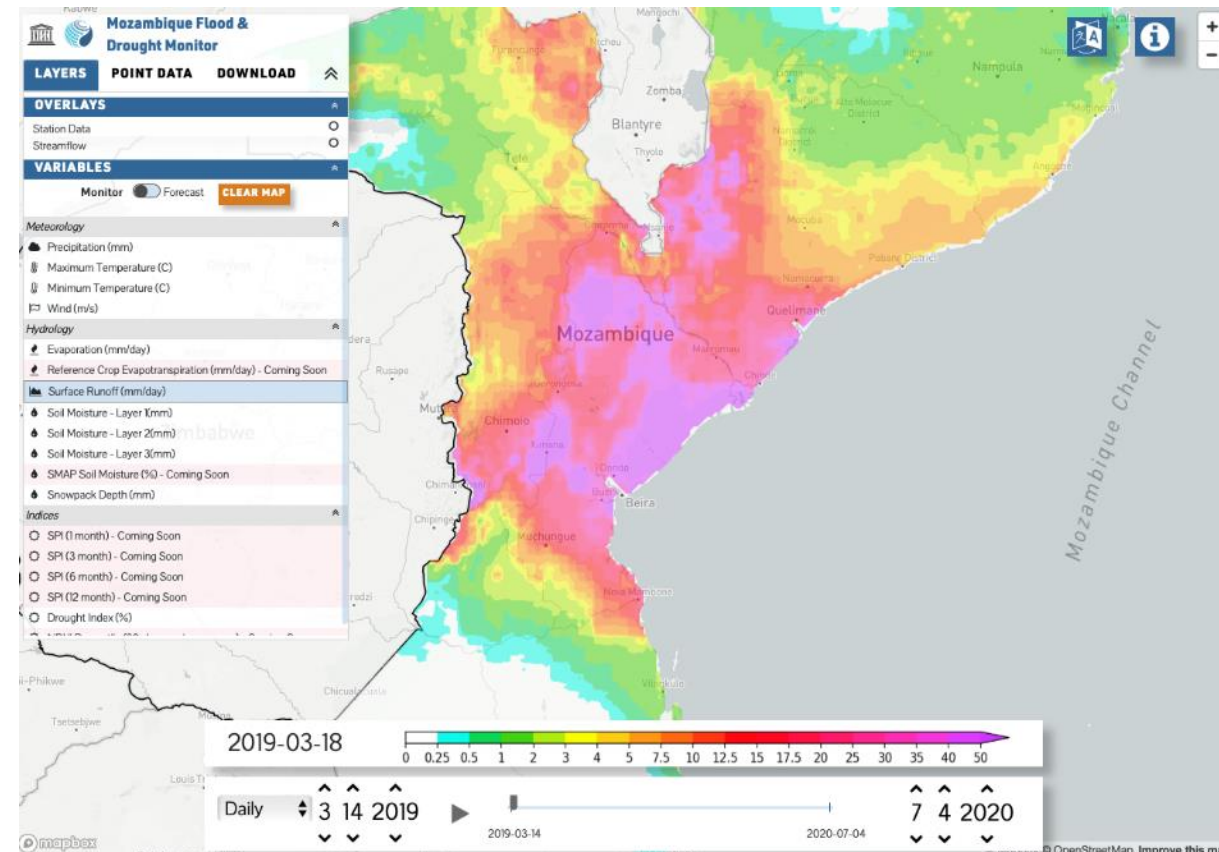


24-hour, AI-powered forecast of flooded areas in Mozambique's flood-prone areas

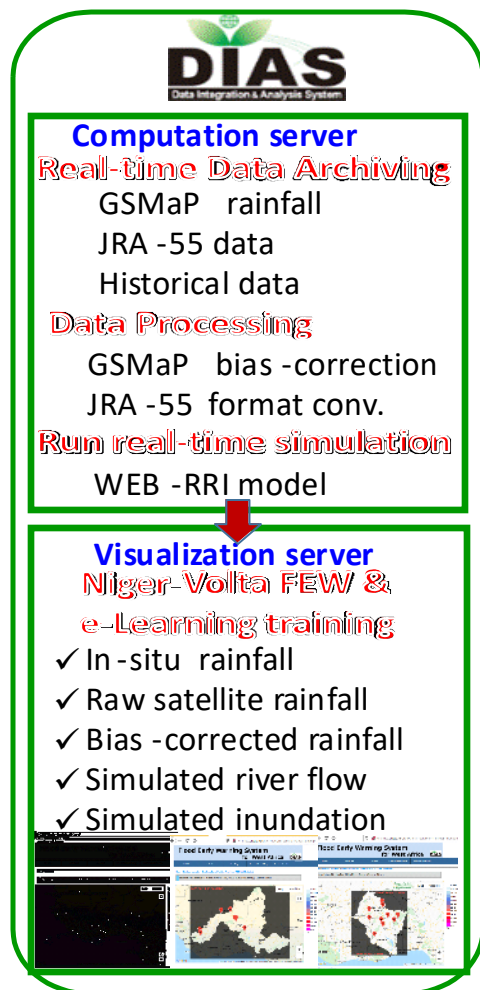


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BIOSPHERE RESERVES
CLIMATE CHANGE OBSERVATORIES

Government
of Flanders



Satellite data for climate change adaptation



Water disaster platform (WADiRE-Africa)

Using satellite data to complement the ground data for flood forecasting

Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, Togo

Schematic diagram of the flood early warning system (FEWS) prototype version 1.0 for West Africa on Data Integration and Analysis System (DIAS).

Using low cost, low power AI devices

Using low cost, low power AI devices: TinyML

Sound

Keyword Spotting



Vibration

Motion & biometric



Vision

Image Spot



Tiny machine learning (TinyML) is a fast-growing field of machine learning, capable of performing **on-device sensor data analytics** at extremely **low power consumption** and **with low-cost devices**. It does not require an internet connection, making it ideal for remote/rural areas.



TinyML can be used to detect wildfires and floods using sound.

System designed by The Abdus Salam International Centre for Theoretical Physics (ICTP), UNESCO

To enable governments, donors, private companies, and academic institutions to collaborate and scale innovative approaches for building resilient societies,

UNESCO is developing a digital innovation hub to help governments, donors, and stakeholders identify appropriate DRR and climate adaptation solutions based on their needs.

Key Features

Searchable catalogue: where private sector actors can register innovative solutions and services.

Efficient matching: between solution providers and users.

Market stimulation: by creating new entry opportunities and promoting competitive pricing.

Open submission feature for new tools: collected 1200 solutions globally, but more tools can be added.

Search Practices

Filter

Clear all filters

125 results | Sort by: Latest | View:

Region

Countries

Intervention Phase

Product / Service Type

Main purpose of the product

Applicable Disasters

Payment Type

Type of Organisations

Search

Search



Disaster Risk Reduction Tools

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Product / Service

Product/Service Introduction

Product/Service Type

Sensor

Main purpose of the Product/Service

Disaster monitoring and response management

Applicable Disasters

Wildfire

Target Users

Local government

Estimated Price

Contact the company

Product/Service Introduction Website

[wildfiresensor](#)

Intervention Phase



The Silvanet Wildfire Sensor by Dryad Networks is a solar-powered, AI-enabled gas sensor that detects wildfires in their earliest smoldering phase and transmits real-time alerts via a LoRaWAN mesh network.

Competitive Advantages

- It is lightweight, easy to install, and designed to minimize maintenance costs.

Implementation Process

Estimated Price

Contact the company

Payment type

Subscription

Availability of Free Trial

Not applicable

Estimated Time Required for Implementation

9 days

Support System (During and After Implementation)

Lorem ipsum dolor sit amet

Track Record

Number of Countries Implemented

40

Region of implementation

Asia

Countries of implementation

Japan China

Number of Companies/ Organizations implemented

100

Other Information

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Organisation Information

Organisation Name

Bell System 24, inc

Type of Organisations

Private Company

Headquarters location (country)

Japan

Address

6th Floor, Kamiyacho Trust Tower, 4-1-1 Toranomon, Minato-ku, Tokyo

Year of Establishment

1982

Representative's Name

Hiroshi Kajiwara

Website

[wildfiresensor](#)

Related links

[https://related link/](#)

[https://related link/](#)

[https://related link/](#)

Drafts of the platform visuals

Investing 1 dollar in prevention saves 7 dollars spent after a catastrophic event



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Educational, Scientific
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