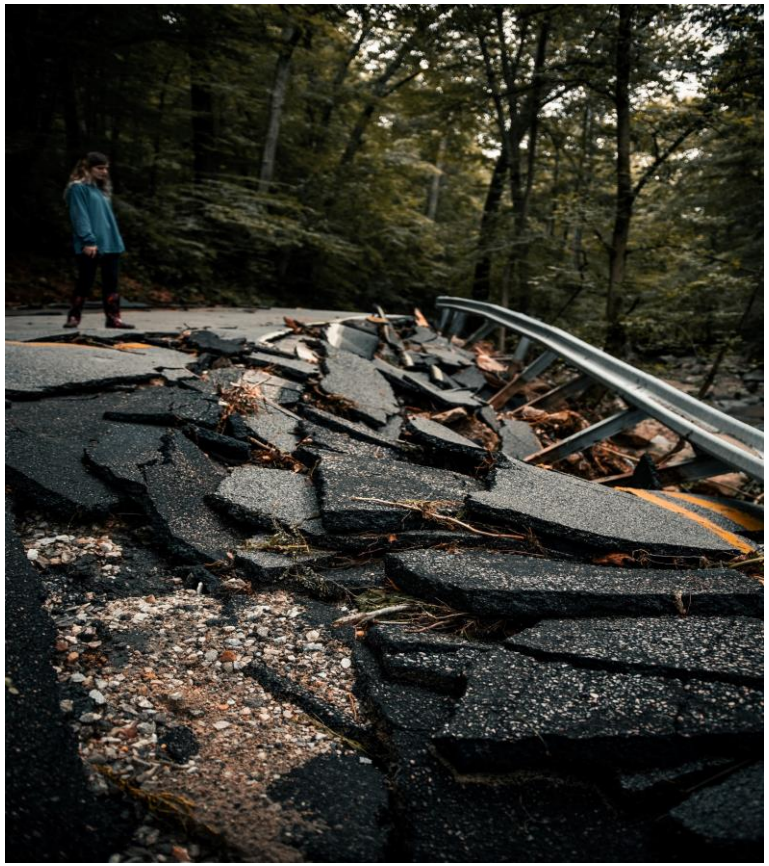
Innovation and Disaster Risk Reduction

Faduma Ali, Disaster Risk Reduction Unit



UNESCO‘s 8 Thematic Areas for DRR

- At the interface of a wide mandate - Natural and Social Sciences, Education, Culture, and Communication and Information, UNESCO takes **a multi-hazard, multi-disciplinary and multi-stakeholder participatory approach**.

- **8 cross-cutting thematic**

- UNESCO explores **both conventional and innovative solutions** for effective preparedness and response.

- **UNESCO’s priority areas**: Africa, gender, Small Island Developing States (SIDS) and youth.

UNESCO DRR Activities around the globe

Europe

- ✓ The Portuguese Sea and Atmosphere Institute (IPMA) as Tsunami Service Provider (TSP)
- ✓ Earthquake early warning system in Croatia (cultural heritage)
- ✓ Issue Based Coalition for Environment and Climate Change
- ✓ OPERANDUM (Nature based solution for DRR) in 7 countries
- ✓ RURITAGE (Rural Regeneration) in 6 countries
- ✓ SHELTER (Culture Heritage DRR) in 10 countries
- ✓ Collective community management approach and capacity building activities in 6 countries

Arab

- ✓ Earthquake early warning system in Morocco
- ✓ Science and Technology Advisory Group for DRR
- ✓ Nature-based solution for natural hazards
- ✓ Atlas on Natural Hazards: A tool for socio-ecological system resilience in the Arab States
- ✓ Urgent Interventions to Build Socio-Ecological System Resilience to Natural Hazards in MENA region

Latin America and Caribbean

- ✓ Tsunami inundation and evacuation maps in 6 countries
- ✓ **Changing behavior** (upon hurricane early warning system)
- ✓ **AI** Decision support by Bayesien Model
- ✓ Science and Technology Advisory Group for DRR
- ✓ PRERADE (Risk governance) in Mexico
- ✓ **Earthquake DRR** in Lac5 (Built) in 5 countries
- ✓ VISUS (School safety assessment) in Haiti, Peru, Dominican republic
- ✓ CARIDIMA Youth Platform: young professional network on DRR and CC in Caribbean SIDS)
- ✓ Guidelines for developing a National Strategy for DRR in the Caribbean Culture Sector
- ✓ Workshop on Climate Impacts & Vulnerabilities in Guyana

Africa

- ✓ **AI Chatbot** and SMS analysis for DRR in East Africa (STEDPEA)
- ✓ **Flood risk management** in West Africa
- ✓ Floord risk management in Southern Africa
- ✓ Earthquake early warning system in Ghana
- ✓ **Social Media analysis by AI** in East Africa
- ✓ Post Hurricane Idai flood risk management (Southern Africa)
- ✓ Integrated DRR courses in Ethiopia
- ✓ Enhancing Climate Services for Improved Water Resources Management in climate sensitive Regions
- ✓ Strengthening of evidence-based decision and policy making in Gambia
- ✓ Flood and Drought Monitor Platforms

ASIA and Pacific

- ✓ **Open Science for DRR (IKCEST, Chinese C2C)**
- ✓ The South China Sea Tsunami Advisory Centre (SCSTAC)
- ✓ Landslide Early Virtual Observatories in Nepal
- ✓ U-INSPIRE: young professional platform for DRR
- ✓ Science and Technology Advisory Group for DRR
- ✓ Disaster Risk Reduction and Management Training in Nepal
- ✓ International Workshop for Disaster Risk Reduction Knowledge Service in China
- ✓ Monsoon School on Urban Floods in India

Mapping of Innovative solutions for DRR

Product

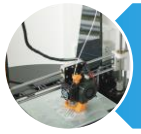
Numerical


AI Chatbot


Satellite Imagery


Machine Learning Device


Drone


3D Printer

Physical

Approach

Standard/ Platform

Open Science Platform for DRR

Early Warning Systems for All

Youth Engagement

Multi- Hazard Risk Assessment

Community based DRR

Localisation / Personnalisation

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Designed by UNESCO

UNESCO Figures

In 2022, UNESCO supported:

- **39 countries** in developing their cross-sectoral development strategies/plans to mitigate disaster and climate risk at national, sub-national and/or sectoral levels
- **14 countries** in strengthening their early warning systems
- **52 countries** in updating their frameworks for preparedness and/or early/anticipatory action
- **3 countries** in developing and implementing recovery and reconstruction frameworks which incorporated elements of disaster risk reduction and/or ‘build back better’

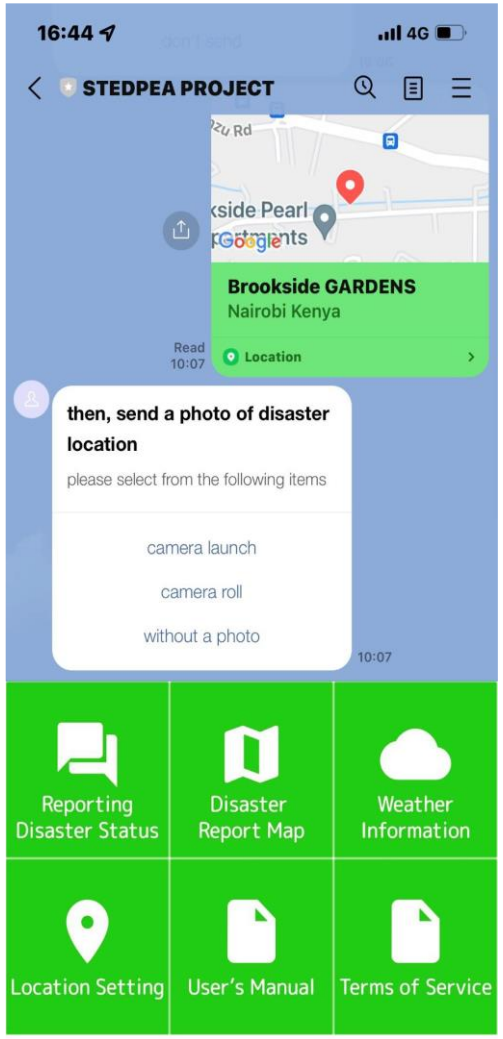
AI for efficient risk communication

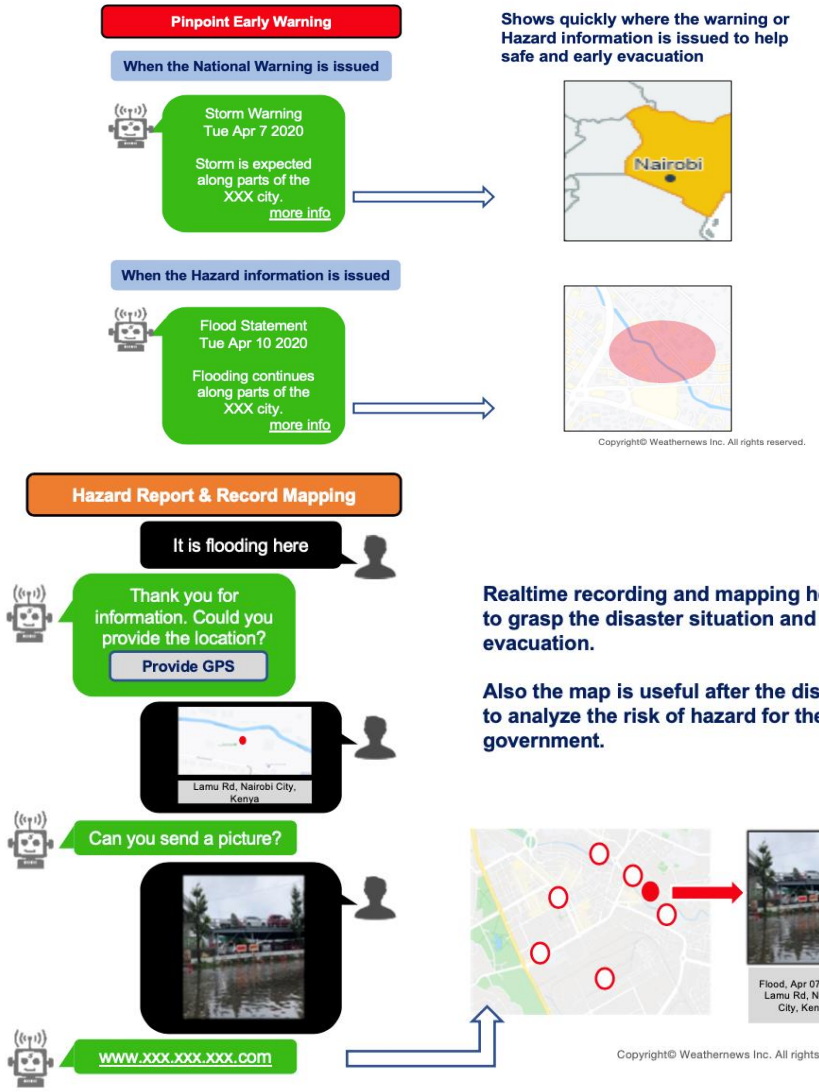
Strengthening Disaster Prevention Approaches – STEDPEA

LINE

WN weathernews

SCIENCE FOR RESILIENCE
NIED 防災科研





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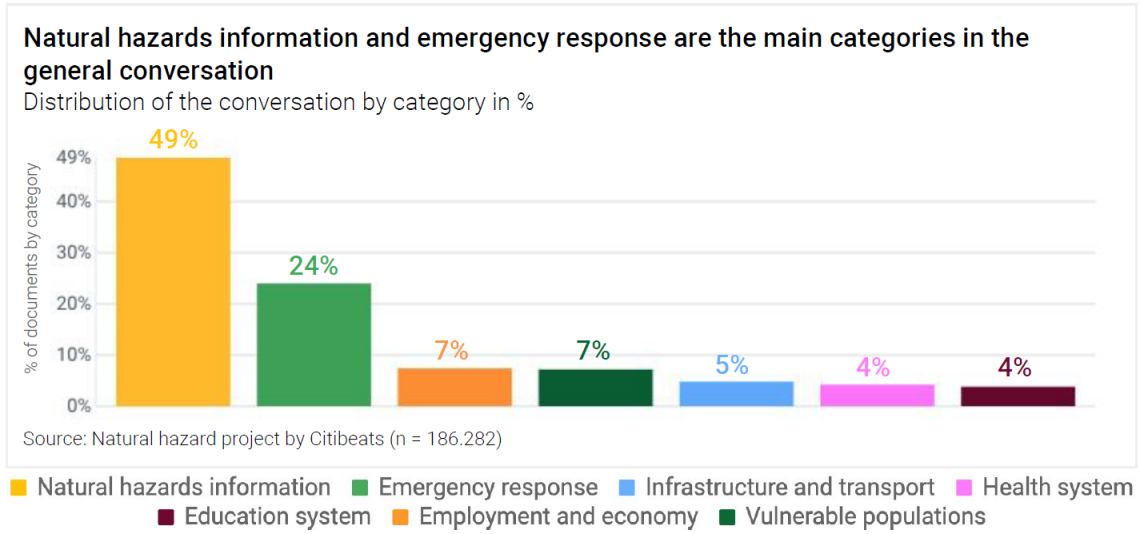
Social media analysis using AI



Floods and landslides in Kenya

citibeats

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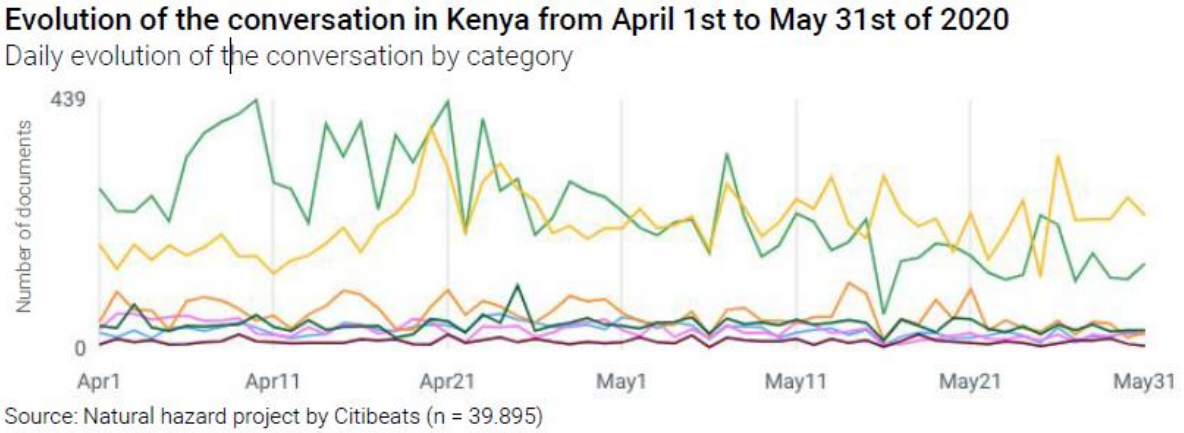

Change of people's concern among 7 categories

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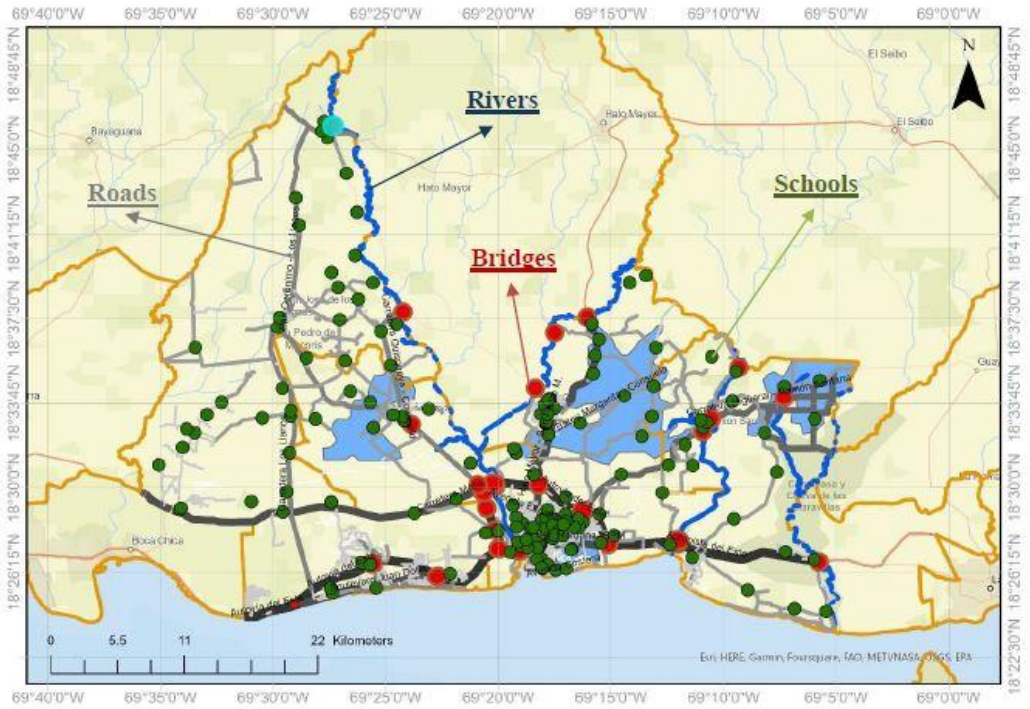
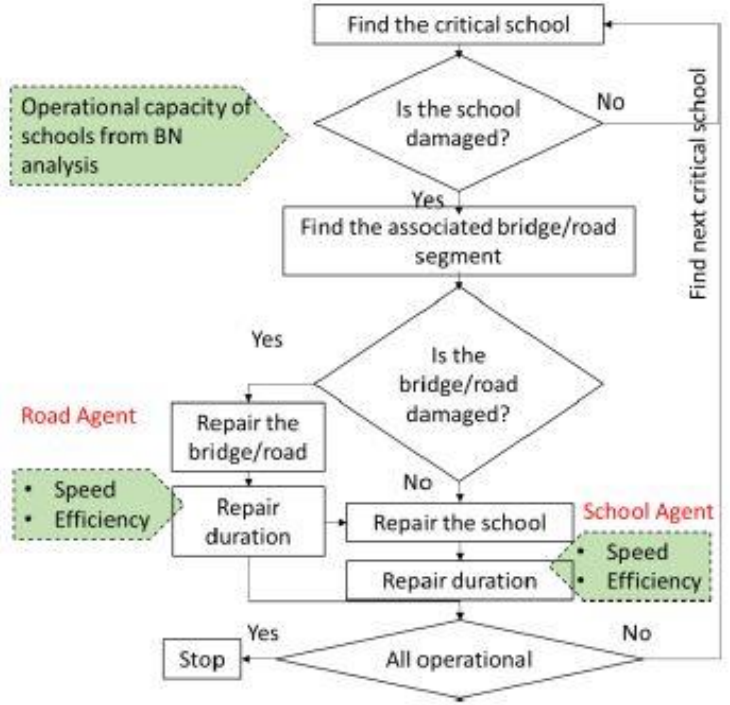
Planning to minimize education disruption



The figure shows the exposed assets in the San Pedro de Marcos city with 200,000 inhabitants, including 288 schools, 80,000 students and 46 bridges.



The GIS information collected in the project was used in the UN Country Team meeting during/after Hurricane Franklin, which hit the Dominican Republic on July 2023.

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This figure models the interactive decision-making between various stakeholders of the system, such as the Operators of the Road Network and School Network, which will be modeled as the Agents.

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Tiny Machine Learning Devices

Using low cost, low power AI devices: TinyML

Sound

Keyword Spotting

Vibration

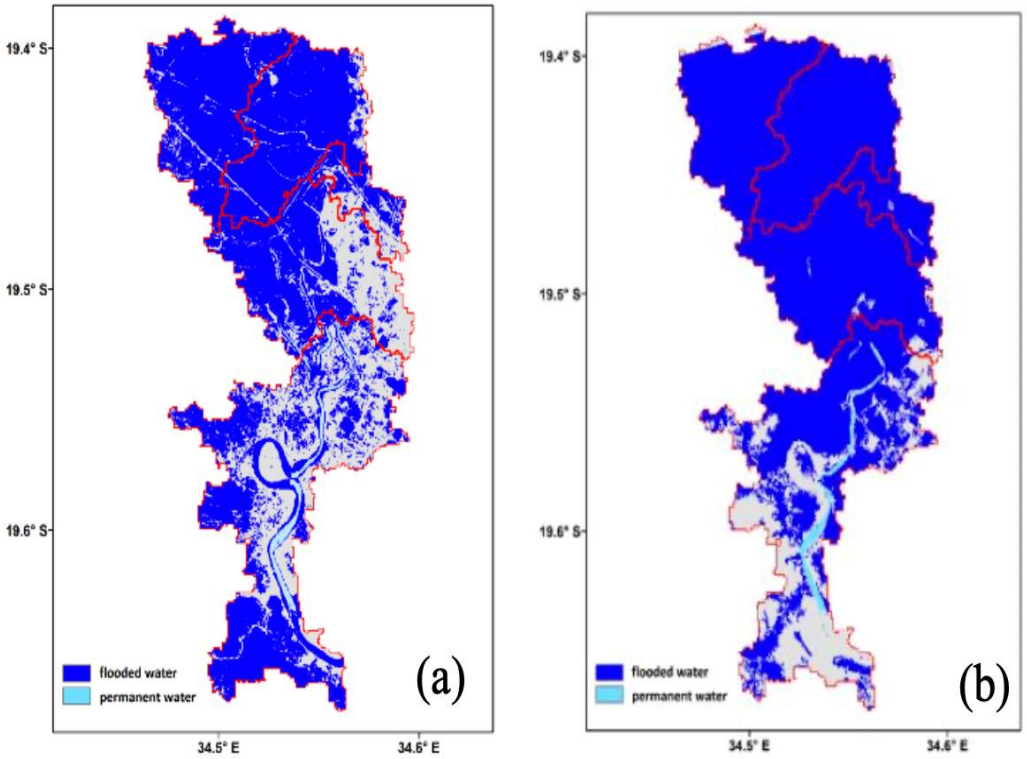
Motion & biometric

Vision

Image Spot

Predicted

Observed



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

The Abdus Salam International Centre for Theoretical Physics

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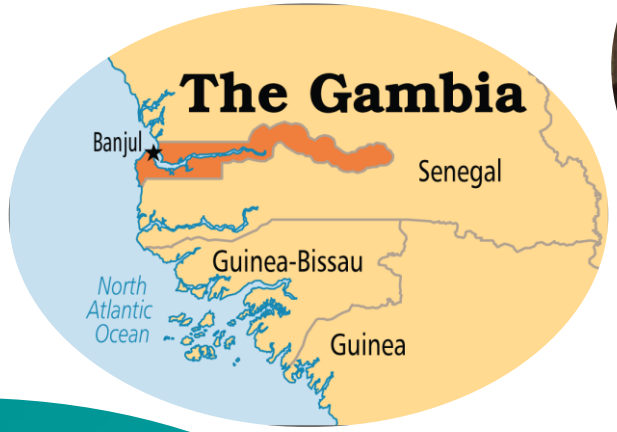
Drones for early warning systems

The project aims to use drones for early warning systems for flood management in the Gambia targeting the Lower and Upper River Regions and the Greater Banjul Area.



India-UN Development Partnership Fund

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Community Engagement

YEMEN: Early Warning System in World Heritage Sites

Building Climate-resilient Communities in Historic Cities through Strengthened Disaster Risk Management and Awareness

- Assistance to local authorities and vulnerable communities in the Old City of Sana'a and the Old Walled City of Shibam, through the establishment and reinforcement of early warning systems,
- Increasing the communities' disaster risk reduction awareness

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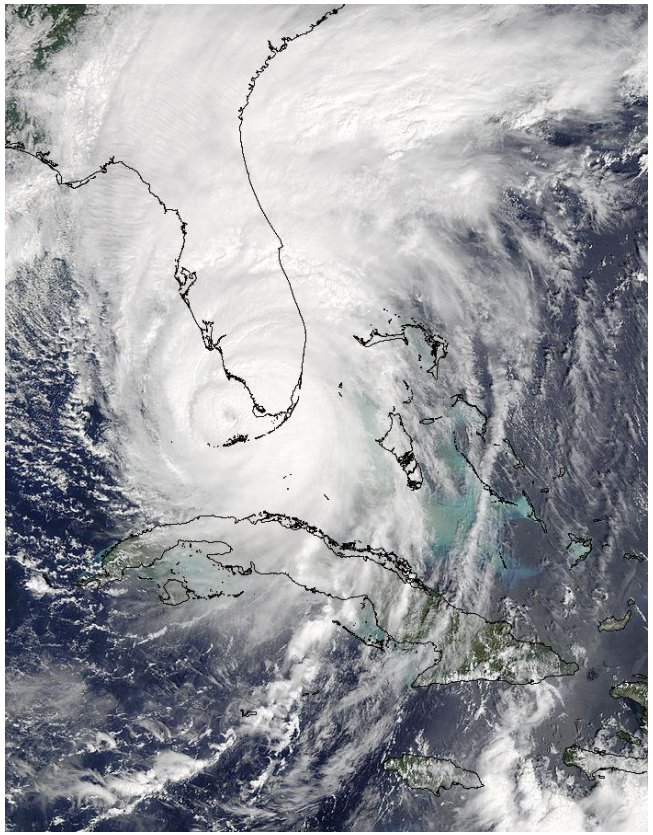
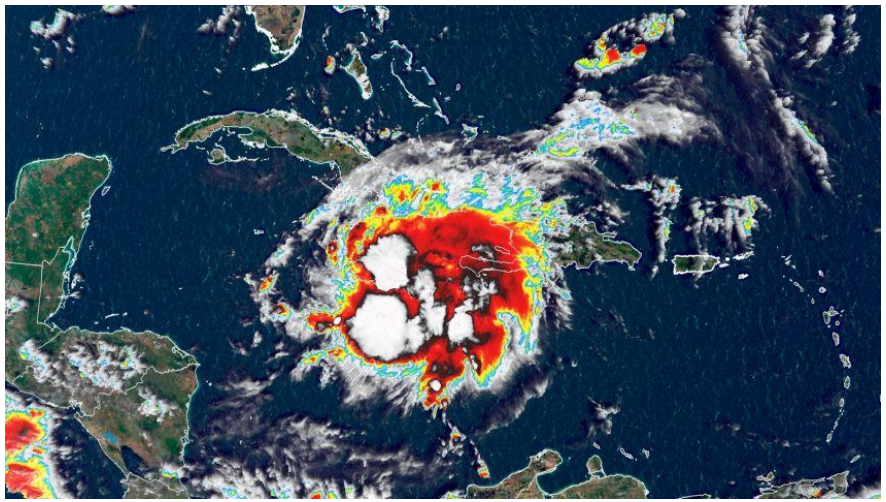
Risk Communication

Strengthening local and community capacities in the face of natural disasters in the Caribbean SIDS

- **Haiti, the Dominican Republic**, **The Bahamas**, **St Lucia** and **Saint Vincent and The Grenadines**
- Goal: Strengthen the capacity of the community on hurricane risks and preventive actions aligned with the municipal and national nations as well as that of the Caribbean region.
- Special focus will be given to youth, children and women.





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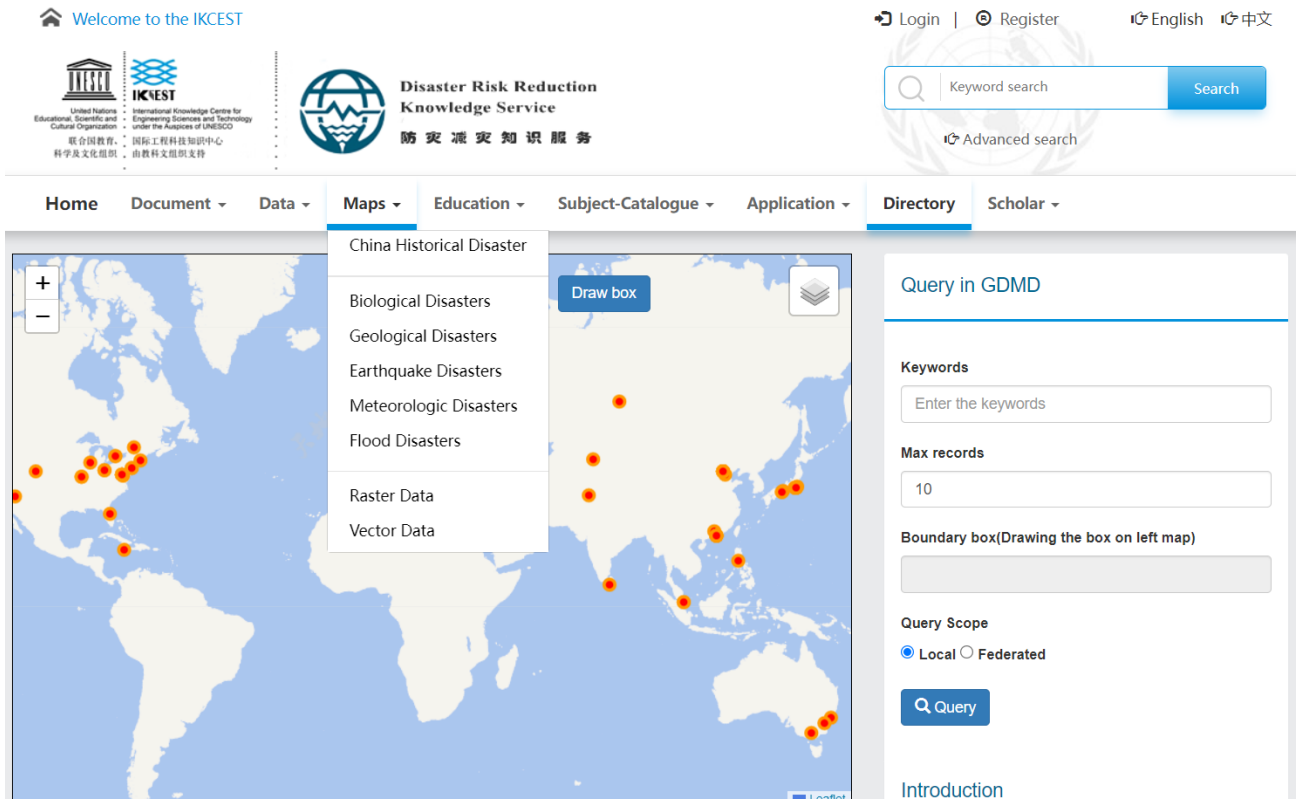
Open Science platform on DRR

International Knowledge Centre for Engineering Sciences and Technology (IKCEST), C2C in China and UNESCO have been working on big data and data format on DRR.

In December 2022, IKCEST launched an Open Science data platform on DRR, where we find open data on natural and biological hazards.



Screenshot of the platform

New project in the Pacific SIDS

Where: Fiji, Solomon Islands, Tuvalu and Kiribati

What: to build a culture of resilience in the Pacific SIDS by leveraging STI-based solutions and capacity-building

When: 2024 - 2026

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

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