Building Resilience to Natural Hazards through Open Data and Citizen Science: Bangladesh

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State of the Map Asia 2024, Cox's Bazar

Setting the Context

- Bangladesh is one of the most disaster-prone countries in the world, facing recurring floods, cyclones, and riverbank erosion.
- - Frequent natural disasters cause significant human and economic losses.
- - Climate change exacerbates the intensity and frequency of these events.

Problem Statement

Key Questions:

1. How can data accessibility improve disaster resilience?
2. What role can local communities play in building resilience?

Current Gaps:

- Limited access to real-time data for vulnerable populations.
- Low community involvement in decision-making processes.
- Fragmented efforts by agencies with inconsistent data sharing.

Overview of Natural Hazards in Bangladesh

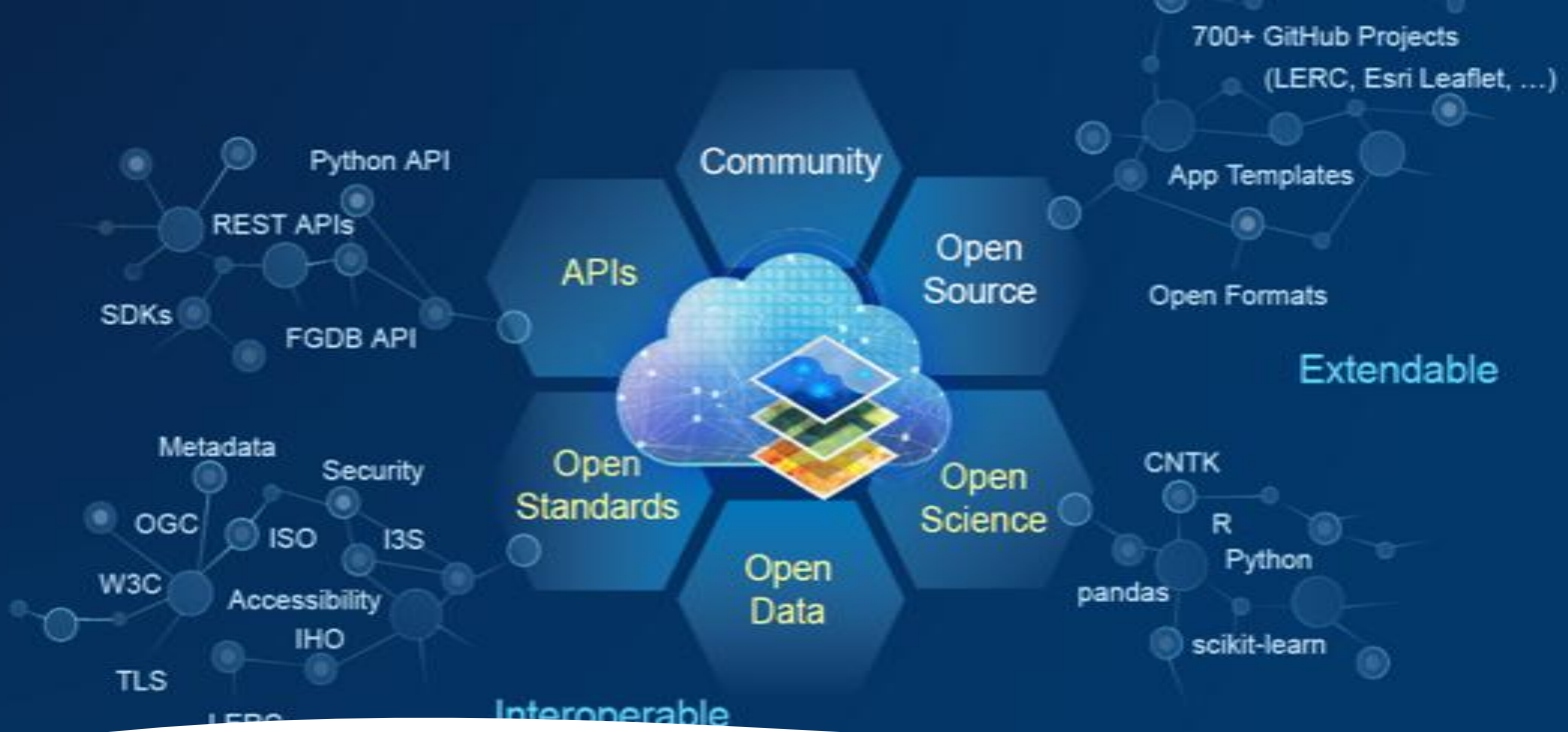
Types of Hazards

- Floods & Flash Floods: Affecting 70% of the country during severe monsoons.

- Cyclones: Impacting coastal areas with devastating storm surges.

- Riverbank Erosion: Displacing thousands annually.

- Droughts: Especially in the northwest (Rajshahi region).



Understanding Open Data

Definition:

- Data that is freely available for anyone to use, modify, and distribute.

Relevance to Disaster Management:

- Real-time flood monitoring.
- Satellite imagery for damage assessment.
- Crowdsourced maps for evacuation routes.

Global Examples:

- Copernicus Emergency Management Service (EU).
- Humanitarian OpenStreetMap (HOT).

Citizen Science: Empowering Communities

Definition:

- Engaging non-professionals in data collection, analysis, and reporting.

Why It Works:

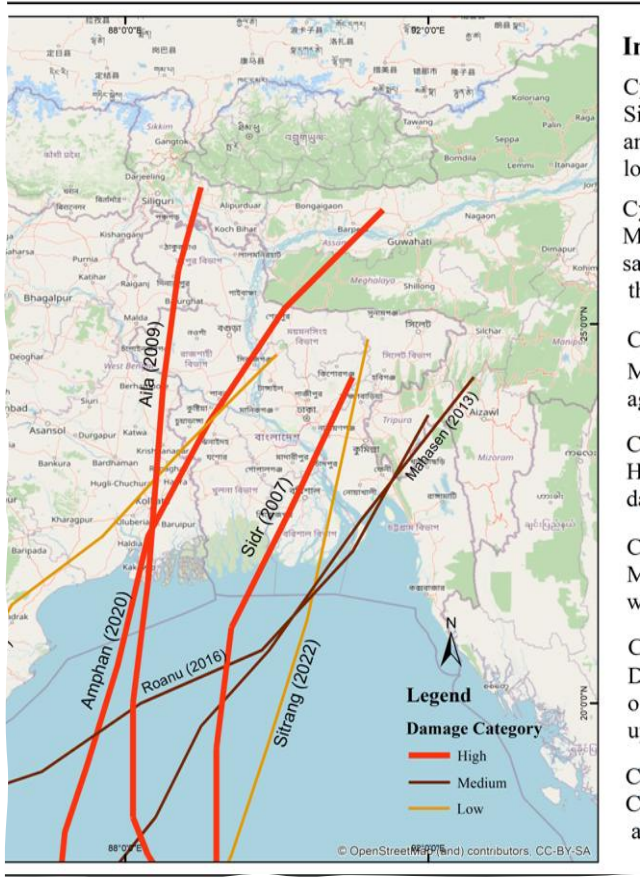
- Powers of local knowledge.
- Enhances data validation and coverage.
- Builds trust between communities and authorities.

Bangladesh Examples:

- Flood early warning systems co-created with local volunteers.
- Cyclone preparedness drills involving community feedback.

Case Study 1: Cyclone Preparedness in Coastal Bangladesh

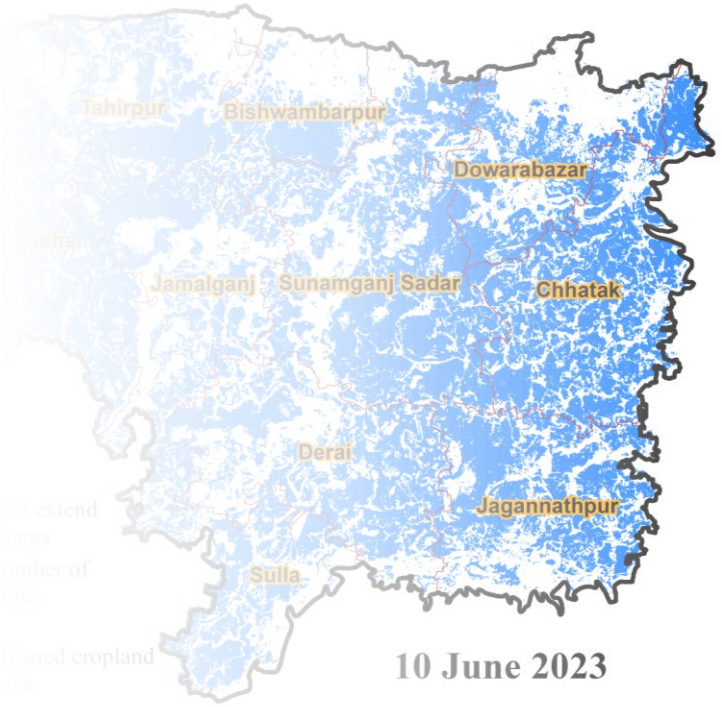
Project Name: Building Resilience to Cyclone Hazards through Open Data and Citizen Science

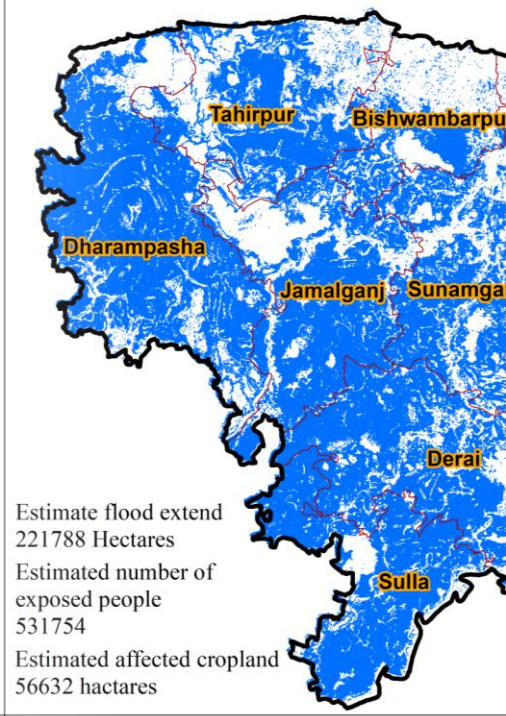


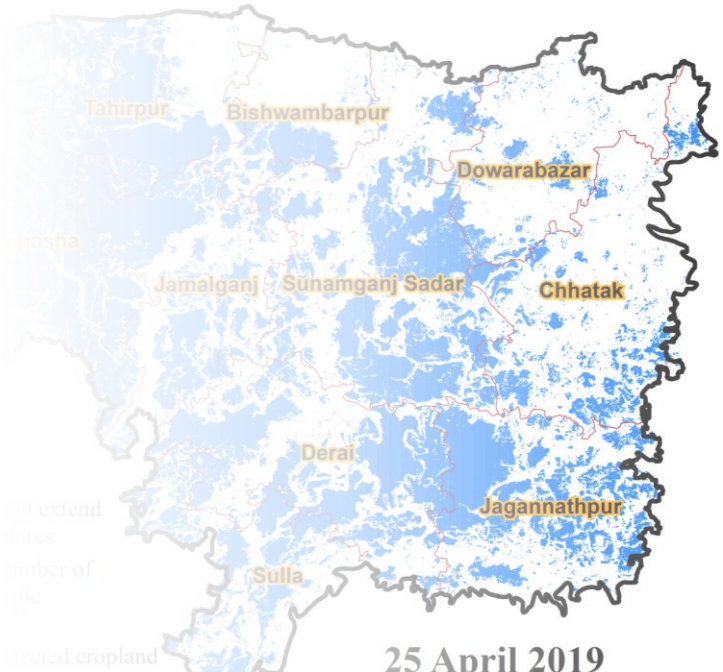
Case Study 2: Flood Mapping with Synthetic Aperture Radar (SAR)

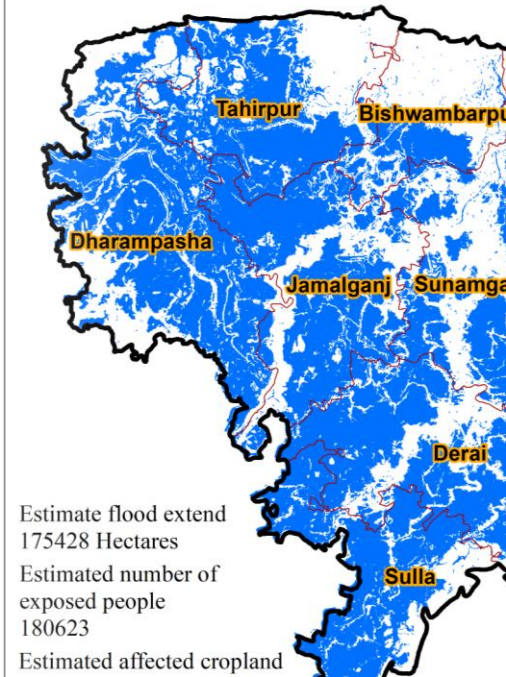
Project Name: **Geospatial Data-Based Flood Damage Assessment in Sunamganj District**

Impact: Enhanced speed and accuracy of flood damage reports, reducing response time by 48 hours (Based on Data availability).









Tools and Technologies Enabling Resilience

Geospatial Platforms:

- QGIS: Open-source GIS software for community mapping.
- Google Earth Engine: Remote sensing analysis for hazard detection.

Crowdsourcing Platforms:

- OpenStreetMap (OSM): Mapping underserved areas.
- KoboToolbox: Collecting field data during disasters.

UAV Integration:

- Agisoft Metashape for 3D modeling of disaster-prone areas.

Stakeholder Collaboration

Key Stakeholders

- Government: BMD, BWDB, Ministry of Disaster Management and Relief (MoDMR).

- NGOs & INGOs: Save the Children, BRAC, UNDP, The World Bank.

- Academic Institutions: Jahangirnagar University, BUET.

- Private Sector: Tech companies providing data solutions.

Challenges to Open Data and Citizen Science in Bangladesh

- Data Accuracy and Validation Issues.
- Digital Divide: Limited technology access in rural areas.
- Policy Gaps: Lack of national frameworks for open data usage.
- Sustainability: Long-term community engagement challenges.

Recommendations for Strengthening Resilience

1. Policy Reform: National Open Data and Citizen Science Strategy.

2. Capacity Building: Training local youth and communities.

3. Technology Access: Expanding rural connectivity.

4. Cross-Sector Collaboration: Encouraging partnerships.

5. Public Awareness Campaigns: Promoting citizen involvement.

Transboundary Actions

Conclusion

Key Takeaway:

- Open data and citizen science offer transformative potential for disaster resilience in Bangladesh.

Call to Action:

- Promote inclusive policies.
- Engage local communities in data collection and hazard monitoring.
- Foster a culture of shared responsibility for disaster resilience.

Q&A

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Photo Sources: Al Jazeera
https://www.aljazeera.com/gallery/2024/8/23/deadly-floods-leave-millions-stranded-in-bangladesh
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