

# Empowering Vulnerable Regions through Accessible Disaster Mapping: Developing User-Friendly Platforms for Underdeveloped Regions and Non-Specialists

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## Abstract:

In an era characterized by an increased frequency and severity of disasters, such as extreme weather events and pandemics, vulnerable populations, particularly in underdeveloped regions, are significantly impacted. These communities are exposed to heightened risks, compounded by insufficient resources and infrastructure to effectively manage and mitigate such disasters. Disaster mapping has emerged as a crucial tool in crisis management, essential for harnessing actionable insights that markedly enhance the disaster preparedness and mitigation capabilities of organizations, governments, and the public.

However, the challenges are more acute in underdeveloped areas, where there is often a significant shortage of professionals trained in advanced geospatial technologies, coupled with a lower overall geospatial maturity. This presentation delves into the contributions and challenges of two pivotal initiatives—one led by the academic sector and another supported by a United Nations agency—aimed at bolstering the disaster response capabilities of underdeveloped regions.

Case 1: Regional Crisis Response Capability Assessment and Enhancement: A Platform Integrating Transnational Open Data for Analyzing Extreme Weather Impacts

Developed by Peking University, this platform is specifically designed for one of the most typhoon-prone regions in the world, the Western Pacific. It utilizes nighttime light data along with other multi-source geographic information to assess the impacts of extreme weather on regional socio-economic activities and their recovery processes. By integrating disaster resilience indicators with geographic data—including nighttime lights, infrastructure, and climatic environmental data—the platform enables comprehensive data integration and analysis. This integration supports regional disaster risk assessments and the development of mitigation strategies, providing a critical tool for enhancing regional disaster preparedness.

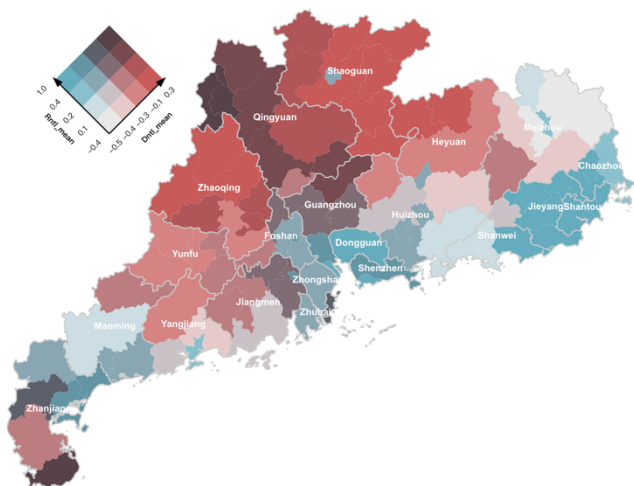


Figure 1. Nighttime Light Fluctuations Pre- and Post-Extreme Weather Events (Dntl: Decrease Rate; Rntl: Recovery Rate)

## Case 2: Enhancing Crisis Monitoring and Response: A Platform for Zoonotic Disease Surveillance and Management in Developing Countries

This case study discusses a very early or practical work of collaborative initiative between FAO/IAEA (the Food and Agriculture Organization of the United Nations and the International Atomic Energy Agency). The platform supports the surveillance and management of zoonotic diseases, emphasizing the practical application of Geographic Information Science (GIS) to enhance project efficiency and response rates. The report focuses on the discussion of GIS applications in international organizations for better enhancing the capacity of Underdeveloped Regions and its challenge rather than the context of this project, highlighting how various experts, for example, veterinarians and epidemiologists, rely on GIS professionals' deep expertise to enhance their understanding and application of geospatial technologies, thus optimizing disease monitoring and management efforts.

These case studies exemplify the vital role that user-friendly disaster mapping platforms play in empowering non-specialists and enhancing disaster resilience in underdeveloped regions. They underscore the importance of interdisciplinary collaboration and the potential of accessible technologies to facilitate effective disaster management and resilience building across vulnerable communities worldwide. This presentation also explores the broader implications of such technologies on global disaster management strategies, suggesting pathways for future research and implementation in other high-risk areas.