**Project Title:**

Mapping Resilience: Emergency Centers Planning for Low-Income Communities Facing Extreme Weather Events

**Summary:**

Establishing data-driven emergency centers to enhance safety and resilience for low-income communities facing floods and heatwaves.

**Challenge Description:**

Low-income communities are significantly impacted by extreme weather events, especially floods and heat waves. These communities often lack robust infrastructure, face geographic risks, and have limited access to critical services, making emergency response challenging. Our project uses King County, Washington, as a pilot study, analyzing historical data from between 2018 and 2022. This data includes flood patterns, temperature extremes, elevation risks, power outages, and infrastructure conditions. By integrating these layers on a comprehensive map, we aim to identify optimal sites for emergency centers. These centers will offer medical care, food distribution, educational workshops on disaster preparedness, and community-based evacuation planning, as well as volunteer coordination to improve community preparedness.

The solution employs an interdisciplinary approach, integrating engineering, environmental science, public health, education, and community engagement strategies to ensure local relevance. To enhance long-term resilience, the project will also include community-based evacuation planning and preventive measures like simple levee construction. By incorporating additional data such as road closures and building efficiency, we can develop a more effective network that ensures emergency centers are accessible and strategically located.

The data-driven model is designed for scalability, allowing for adaptation in other U.S. regions and international contexts. This approach aims to provide broader impact, ensuring vulnerable communities benefit from improved emergency preparedness and response.

**Justice-Centered Vision Statement:**

Our solution promotes climate justice by ensuring that low-income, vulnerable communities receive timely access to critical resources and services during extreme weather events. The emergency centers are designed to empower residents through equitable resource distribution, disaster preparedness education, and culturally aligned support. By centering community voices throughout the process, the project builds infrastructure that not only addresses immediate needs but also fosters long-term resilience and sustainable development. This approach aims to reduce existing inequities and increase the capacity of marginalized populations to withstand and recover from climate-related challenges.

**Community Engagement Plan:**

We will collaborate with community leaders, organizations, and residents to identify the most suitable sites for emergency centers. Engagement methods will include participatory mapping sessions, surveys, educational workshops on disaster awareness and evacuation planning, and focus groups to capture diverse perspectives and ensure equity. Local traditions and knowledge will be incorporated into planning to ensure cultural relevance. If resistance arises, we will adapt strategies transparently based on feedback, ensuring trust and alignment with community priorities. We will emphasize equitable representation, making sure underserved populations have a strong voice in shaping project outcomes.

**Implementation Plan:**

* Data Collection and Analysis: Analyze historical data from 2015, covering floods, temperature extremes, elevation, power outages, road closures, and building efficiency to identify high-risk areas.
* Community Workshops: Organize participatory mapping, disaster preparedness education, and planning workshops to identify potential sites for emergency centers, fostering community ownership.
* Stakeholder Coordination: Collaborate with local governments, NGOs, healthcare providers, educational institutions, and community groups to establish clear roles and responsibilities.
* Center Design and Establishment: Develop emergency centers offering medical care, food distribution, educational programs, and volunteer coordination, incorporating culturally relevant designs and services.
* Sustainability and Prevention: Implement sustainable building practices, local material usage, and community-based preventive measures such as simple levee construction and evacuation planning.

**Interdisciplinary Collaboration Plan:**

Our team will consist of experts in engineering, public health, data science, education, and community outreach. This collaboration will ensure a holistic and adaptive approach. Engineers will focus on infrastructure resilience, public health specialists will design medical services, education specialists will develop disaster preparedness programs, data scientists will create predictive models and mapping tools, and community outreach experts will engage local stakeholders to ensure solutions align with community needs.