



INNOVATION FUND

Building Resilient Communities (BRC)

Parent project: *Harnessing Innovative Technologies to Support Resilient Settlements on the Coastal Zones of the Caribbean (HIT RESET Caribbean)*

PROJECT COORDINATOR

Habitat for Humanity Trinidad and Tobago (Habitat TT)

PARTNER

Geographic Information Systems Society of Trinidad and Tobago (GISSTT)

LOCATION

Trinidad and Tobago

PERIOD

March 2023 - September 2024

EU FUNDING

EUR 300,000

SECTOR

Urban development

KEYWORDS

Climate change, natural hazards, coastal settlements, environmental research, digital technologies; community mapping

PROJECT CONTACT

Mrs. Jennifer Massiah
Habitat for Humanity Trinidad and Tobago
22 El Socorro Road Extension #2
El Socorro 280636
Trinidad and Tobago

jmassiah@habitat-tt.org
<https://www.habitat-tt.org/>

Mr. Perry Polar
The University of the West Indies (UWI)
Perry.Polar@sta.uwi.edu
<https://hitresetcaribbean.org>

if@oacps-ri.eu
www.oacps-ri.eu

CHALLENGE

The Caribbean is the second most disaster-prone region in the world, having been affected by more than 1,200 natural disasters between 2000 and 2021. Coastal regions' high vulnerability to the impacts of climate change increasingly threatens the Caribbean's economic, social and environmental sustainability.

According to the International Monetary Fund (IMF), the cumulative human, infrastructure and economic costs of damages resulting from natural disasters for Small Island Developing States (SIDS) in the Caribbean often exceed the size of their economies.

Trinidad and Tobago is vulnerable to temperature increases, changes in precipitation, sea level rise, increased flooding, more frequent and intense hurricanes, hillside erosion and loss of coastal habitats. Although the Comprehensive National Coastal Monitoring Programme (CNCMP) has been instituted in 2019 to combat coastal erosion and flooding, a micro-level strategy to systematically assess vulnerabilities and prescribe community-specific resilience measures is absent as well as related data.

PERSPECTIVES

A vulnerability community assessment tool called 'Participatory Approach to Safer Shelter Awareness' (PASSA+) will be deployed to address the challenge of data relevancy and accuracy for decision making.

This participatory methodology is being used because of its disaster risk reduction focus, related shelter safety components, and data collection intertwining community engagement with self-assessment for disaster risks, contributing to informed community decision making.



House on edge affected by land slippage

JUSTIFICATION

It is critical to understand what makes one coastal community more vulnerable than the other by quantifying the vulnerability of these communities to the impacts of climate change. To achieve this, a comprehensive assessment approach is needed that transcends conventional approaches, incorporating participatory methodologies and localised data analytics for the creation of resilient communities capable of withstanding multifaceted climate change impacts.





INNOVATION FUND

METHOD

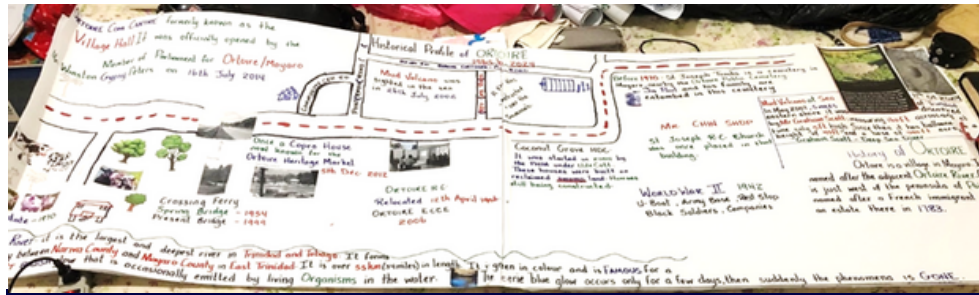
Coastal vulnerability of 10 communities will be assessed through a Coastal Vulnerability Index (CVI), a multi-criterion decision-making method using various physical, socio-economic and coastal forcing indicators that cause susceptibility to extreme sea level scenarios. A resilience action plan will also be created for each of the 10 selected communities within the coastal zone 'T1' (immediate and direct impact area as defined by the 2020 Integrated Coastal Zone Management Policy Framework of Trinidad and Tobago).

Detailed surveys will collect geographically referenced data aligned to individual households, such as demographic, socio-economic, infrastructural, health, hazards and more. This data will be quantified into a single Resilience Index (RI) using a GIS model that collates all data collected. Additionally, unmanned aerial vehicle (UAV) technology will be used to create updated, high resolution aerial imagery of each community. Finally, the location of each household surveyed and its associated RI will be overlaid on the aerial imagery and displayed on an analytic interactive digital dashboard (Resilience Assessment Model), using Esri's online GIS portal. This dashboard will be accessible to the communities and central and national government agencies for further decision making leading to increased resilience.

The community engagement in the participatory data collection methodology using PASSA+ will further fortify ownership of resilience solutions which are identified in the



Resilience dashboard for Ortoire (Northeast Trinidad)



Vulnerability map developed by PASSA participants from the Guayaguayare community (Southeast Trinidad)

resilience action plan, and possibly lead to a series of future localised plans where both local community and government can collaborate for sustainable community development and overall coastal resilience.

INNOVATIVENESS

The strategic integration of cutting-edge geospatial technologies, including drone-based surveying and GIS applications, imparts a dynamic dimension to vulnerability assessments, data-driven decision-making, public participation, and the formulation of a GIS Resilience Index. The conceptualisation of a three-dimensional (3D) model for at-risk coastal features augments visualisation and comprehension. The introduction of the PASSA+ methodology ensures not only community engagement, but also empowerment, enabling communities to astutely evaluate their risks and capacities. It also allows transitioning from a macro to a micro-level vulnerability analysis and the potential replicability in other Small Island Developing States (SIDS).

EXPECTED RESULTS

Impact

- Improved resilience of 10 coastal settlements in Trinidad and Tobago to natural disasters with an emphasis on the effects of climate change.

Outcomes

- Local coastal settlements enabled to update their own digital dashboard.
- Central and national government agencies with access to local coastal settlements vulnerability data to influence policy and national response plans.

Outputs

- Interactive digital dashboard (Resilience Assessment Model) developed.
- 10 coastal communities enabled to execute vulnerability assessments and produce resilience action plans.

HIT RESET is implemented by UWI in partnership with CDEMA and AdeKUS. HIT RESET provides support for projects that develop innovations to increase resilience in coastal communities of the Caribbean and strengthens institutions', national and local governments' ability to leverage information and knowledge for policy amendments.

HIT RESET supports 9 projects implemented in Barbados, Dominican Republic, Jamaica, Saint-Lucia, and Trinidad & Tobago that focus on:

- Digital and modelling technologies utilised by coastal development agencies and high-level decision makers in CARIFORUM countries to predict the impacts of climate change and natural disasters, and to plan and manage coastal communities.
- Government entities, coastal development agencies and coastal communities in CARIFORUM countries developing urban planning policies and/or plans that are conducive to the use of digital and modelling innovations for sustainable coastal development.

