PRIORITIZING CLIMATE RESILIENT TRANSPORT IN BELIZE

Ensuring resilience to natural hazards in highways

Collaboration between the government of Belize and stakeholders has improved the availability and reliability of data on roads, strengthening resilience to weather hazards.

AN INCREASED VULNERABILITY DUE TO CLIMATE CHANGE

With 386 km of coastline along the Gulf of Mexico, Belize is highly vulnerable to hazards. Although it is the least–densely populated country in Central America, its population and economic activity are concentrated in and around a low-lying coastal area. Average annual losses from hurricanes alone are estimated at nearly $7.7 million[1].

Exacerbating Belize's vulnerability is a road system with high exposure to hazards but little redundancy. After a disaster, flooded or damaged roads impede connectivity and slow post-disaster recovery. Since 70 percent of the population lives near primary and secondary roads, any impassible roadway also cuts off access to critical emergency response services.

A lack of reliable data had severely limited the government's ability to make informed investments to improve the resilience of transport networks. In close partnership with government agencies, academia, NGOs, and IFIs, GFDRR supported a multi-pronged approach in Belize to strengthen data availability for transportation and natural hazards, bridging information gaps to better enable design and investment.

[1]Source: World Bank Analysis, 2017

Four critical regions in Belize were identified for climate-resilient interventions

Source: World Bank (2017)
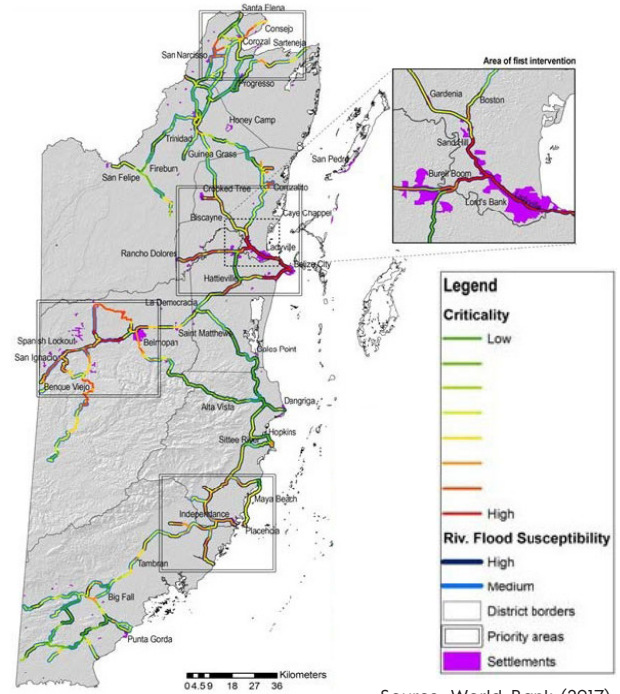
CREATING A PLAN FOR TRANSPORT RESILIENCE

With data scarce on the ground, World Bank and GFDRR teams asked a wide range of stakeholders to provide information along seven indicators. Their input formed the foundation of a unique, multi-criteria evaluation process: stakeholders rated the criticality of individual parts of the road network, and then the project teams combined those ratings with hazard-exposure data to assess which roads should be prioritized. Teams also worked with the government of Belize to analyze flood susceptibility. The methodology – which included participatory processes and data collection and analysis – was tailored to draw from existing data, expert and local knowledge, and strategic survey processes to ensure complete information. The end result was a robust geospatial model that will enhance future monitoring and planning.

Using this methodology, the government is informing targeted investments from international donors, including a $30 million Climate Resilient Infrastructure Project through the World Bank — part of a transformative shift towards a strategic, cost-efficient investment approach to climate and disaster risk in Belize. Specific outcomes of the methodology include:

▸ A six-module Multi-Criteria Evaluation Process, laying the groundwork for a new Practitioner's Guide on Prioritizing Climate Resilient Transport Investment in a Data-Scarce Environment; and

▸ Identification of four key areas of the country as highly susceptible to flooding, which has informed roadway investments.

The result was adopted by the government as a strategic plan, and used to coordinate investments that are being implemented in partnership with various donors, including the World Bank. This process was successful due to strong leadership support from the ministries responsible for national development planning and transport, among others.

LESSONS LEARNED

Collaborative strategies can combat data scarcity.

The evidence-based prioritization of roadway risks was based on institutional and operational knowledge, as well as the analysis of newly collected data. Although initial data was limited, the over 35 participants that were engaged in the process contributed a significant body of knowledge and institutional memory. This knowledge informed the discussions and scoring processes that built structured consensus on the priorities.

Organizations that facilitate the decision-making process should participate in technical discussions.

For example, the Ministry of Works, which is responsible for road infrastructure, participated in both the criticality and flood-susceptibility components of the evaluation, and is now integrating disaster resilience into the design and construction of roadways. In one project, the future design of a 15-mile segment on Philip Goldson Highway will incorporate a comprehensive watershed hydrology assessment and novel data (e.g. Terrain Laser Scan - LiDAR) to better address flood management through on- and off-site road drainage infrastructure.

New data will protect up to
70% of citizens
who live near major roadways

NEW GUIDELINES DEVELOPED Based on the process piloted in Belize, GFDRR and the World Bank have developed a Practitioners' Guide, a handbook on prioritizing climate-resilient investments in data-scarce environments and scaling up resilience.

RESILIENT ROADS The new methodology targeted four critical regions with the highest flood susceptibility for climate-resilient interventions. Teams have also developed a prototype online interface to make it easier for policymakers to use the data collected under the project to inform roadway investments.

BETTER DATA FOR BETTER POLICY A Road Network and Geospatial Asset Database was developed for the first time in Belize's history. The database includes 747 road survey points—one every 2 km of road—with detailed information about road surface, condition, and natural hazards. The data enables road planning and maintenance to be risk-informed and more efficient in future developments.

"We are very pleased with the outcomes of the multi-criteria evaluation of Belize's road network that was conducted by the Government of Belize and the World Bank. The results influenced our decisions on which roads to invest in and ensured that the selected investments will improve the country's resilience to climate change and climate vulnerability."

-- Ms. Yvonne Hyde, Chief Executive Officer, Ministry of Economic Development