At the Water’s Edge (AWE): Coastal Resilience in Grenada and St. Vincent and the Grenadines

An integrated approach to adaptation and disaster risk reduction

Approximately 200,000 people inhabit the island nations that make up the Grenadine Bank—93,000 in Granada and 105,000 in St. Vincent and the Grenadines—with 85% of the people concentrated on a narrow coastal strip less than 5 meters above sea level. These two countries are heavily dependent on limited natural resources to support three of their primary sectors: tourism, agriculture, and fishing. Like other small island nations in the Eastern Caribbean and beyond, the Grenadine Bank is on the front lines of climate change. Already they are experiencing hotter temperatures, more frequent and intense storms, flooding, rising sea level, and degraded coral reefs, which in turn threaten lives, property, food, fresh water, livelihoods, and overall economic stability. Faced with these urgent matters, decision makers need to make investments that will save lives today and improve livelihoods into the future.

The At the Water’s Edge (AWE) Project—Helping the governments and local communities of Grenada and St. Vincent and the Grenadines make informed decisions that will reduce their losses and damages and promote sustainable adaptation solutions to adverse effects of climate change

An ambitious 5 year project launched in 2011, AWE partners with local community members, NGO staff, national government agencies, and regional managers to help them better respond to the current and anticipated impacts related to extreme weather events and slow onset events like sea level rise. The Nature Conservancy is working with partners to assess national and local vulnerability and provide a holistic picture of risk to help design and implement locally relevant solutions. Making information standardized, readily available, and easy to use is helping the governments and communities to understand the root causes of risk and make better decisions about adaptation and disaster risk reduction options.
Addressing climate and disaster risks through an integrated approach

In the coastal zone, effectively addressing climate and disaster risks requires an integrated approach that looks at exposure to impacts from climate change and natural hazards—particularly weather related—and their combined effects. For the AWE project, The Nature Conservancy worked with local partners to develop an integrated vulnerability analysis with both national and local indicators. Social, economic, and ecological vulnerabilities and the interplay between them were examined. A model to examine vulnerability at a national scale was used, which took into account exposure, adaptive capacity, and sensitivity of three key social components: 1) critical infrastructure and facilities (i.e. transportation terminals, emergency response, and community facilities); 2) livelihoods (i.e. natural resource dependence and critical industry facilities such as fish processing plants and hotels); and 3) social sensitivity (number of people and houses). A model to assess the vulnerability of natural habitats that provide important protection and buffering services to coastal communities (e.g. mangroves, coral reefs) was also used. Layering the ecological vulnerability assessment with the socioeconomic vulnerability assessment highlighted areas of overlap where adaptation and disaster risk reduction interventions were most needed; it also highlighted the role that nature could play in reducing climate and disaster risk in Grenada and St. Vincent and the Grenadines. The national level assessment framework was then adapted for site scale application to produce a community vulnerability assessment.

Helping communities understand and assess their social, ecological, and economic risks and together build solutions

Visualizing potential impacts is a powerful tool to help communities understand their vulnerabilities and consider future scenarios and different tradeoffs. This is important to motivate changes that need to be made to reduce their risks. Given the different backgrounds that makeup any given community, high-tech computer based maps are not always the most effective means of communication. Not everyone will be able to understand a map on a computer. At the national scale a suite of visualization tools were developed that included web-based maps (http://maps.coastalresilience.org/network/) and computer based maps. At the local level the AWE project worked with local partners Grenada Fund for Conservation, Sustainable Grenadines, and Grenada Red Cross to engage communities through household surveys and Participatory 3D Mapping (P3DM) and integrate the local knowledge and perspectives of nearly 500 community members into the site level vulnerability assessments.
The AWE project takes a collaborative approach to design and offer solutions. The site level process described above led to the development of several proposals (including a community action plan) specifically designed to strengthen the ability of communities to adapt while addressing at the same time critical elements of disaster risk reduction. The participatory process empowers communities to select the options that best align with their desired current and future outcomes based on local needs, capacities, and culture. Partnering with engineers, land use planners, and local NGO’s like the Red Cross, Grenada Fund for Conservation, and Sustainable Grenadines allows communities and decision makers to consider a suite of options and chose an informed path forward.

**Making informed decisions—Challenges in data availability, access, and management**

Central to making informed decisions is having access to pertinent and best-available information. Yet coordination between government agencies and other organizations responsible for collecting and managing data and information can be stymied by lack of resources and inconsistent mandates. To address this gap, the Conservancy has invested in connecting agency departments and other local (i.e. Grenada Red Cross), regional (i.e. the Organization of Eastern Caribbean States—OECS), and international (i.e. the World Bank) organizations that contribute to data production and/or data management relevant to risk reduction and adaptation planning. For example, the Conservancy has been working with the Department of Statistics in both countries to develop methods for translating census information into mapped formats and making non confidential information freely available through an online viewing and mapping platform (see Figure 1). Working closely with the Grenada Statistics department, the Conservancy has developed a coding system that allows census survey data to be linked with spatial representations of survey districts. Additionally, working closely with the Grenada Statistics department, the Conservancy has developed a coding system that allows census survey data to be linked with spatial representations of survey districts. Additionally, in order to support data access, co-management, and use, the AWE project through a partnership with the World Bank, is contributing to the development of holistic databases and critical training of government technical staff. This partnership is making non-confidential information freely available via a centralized system and helping decision-makers access integrated spatial information on relevant ecological, social, and economic systems.

**Developing integrated adaptation and disaster risk reduction plans that recognize the role of nature**

The Nature Conservancy is working with communities and government agencies to help them better understand the connections between natural habitats (like mangroves, reefs, and vegetated shorelines) and the ability of their communities to protect lives, property, and livelihoods. With partners and expert input from the tourism industry, government, coastal engineers, landscape architects, and habitat restoration experts, the Conservancy worked with community members to create action plans for sites in Union Island and Grenville that include short, medium, and long-term actions. Staff from ArquitectonicaGEO (ARQ), worked on a pro-bono basis to learn about community solutions and turn them into easy to understand visual renderings (see previous link). Proposed solutions were realistic, of direct benefit to communities, and included nature based elements like the creation of a living shoreline. These “Living Edges” can for example integrate hard structure to support local livelihood (i.e. fishing) with mangrove plantings to build scalable mangrove islands and protect the shoreline. In this concept, the potential value of hard and soft engineering to armor the shoreline is recognized while protecting livelihood and cultural interests along with property and infrastructure. Proposed solutions are designed to help the communities prosper while adapting to climate change and reducing disaster and climate risk impacts.

![Figure 1. Schematic of potential solution demonstration projects prepared by ArquitectonicaGEO. The schematic suggests several concepts, including mangrove islands and waterfront redevelopment needs identified by community input, as well as concepts discussed in greater detail at an expert workshop (e.g., sub-tidal reef crest enhancement and inland actions including storm water management designs).](#)
Building local, national, and regional capacity

Integrating nature into climate and disaster reduction planning presents new challenges. Many agencies and organizations need to build additional skills to effectively navigate a diverse set of datasets (social, ecological, and economic) and integrate information into decision-making. The AWE project builds capacity at all levels (local, national, and regional) and trains decision makers in using and understanding new information to support decisions about risk reduction strategies and investments. At the national and regional level, the AWE project is working with agencies and other partners like the Red Cross and the World Bank to develop trainings that integrate an understanding of the role of nature in reducing risk. At the local level the AWE project is fostering a new generation of leaders through a targeted set of workshops and trainings as well as participatory mapping activities. To date these activities have trained over 600 people to understand how to integrate climate and risk reduction data in order to inform risk reduction and adaptation planning decisions.

The Nature Conservancy: Bridging Science, Policy, and Practice for Tangible Results

The Nature Conservancy has been developing approaches for coastal hazard mitigation and risk reduction since 2005 and is a leader in advancing the science, developing innovative tools, and demonstrating real-world examples to inform important critical decisions in policy, planning, and practice. Our combination of science, technology, collaboration, and on-the-ground experience leads to pragmatic solutions and lasting results.

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