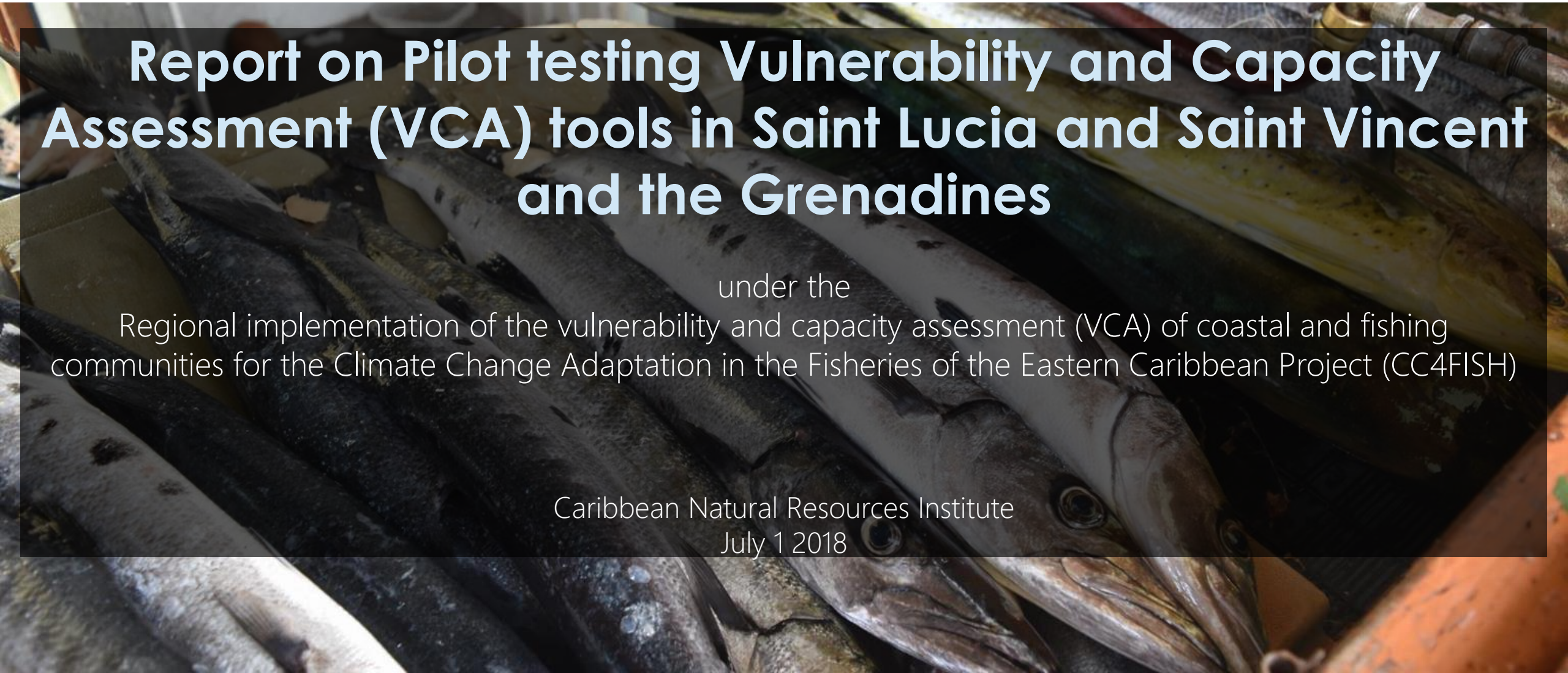


Report on Pilot testing Vulnerability and Capacity Assessment (VCA) tools in Saint Lucia and Saint Vincent and the Grenadines

under the

Regional implementation of the vulnerability and capacity assessment (VCA) of coastal and fishing communities for the Climate Change Adaptation in the Fisheries of the Eastern Caribbean Project (CC4FISH)

Caribbean Natural Resources Institute

July 1 2018

Contents

Overview

What? - This field report synthesises results and identifies key lessons and best practices for applying Vulnerability and Capacity Assessments (VCA) tools in coastal and fishing communities in the Eastern Caribbean based on pilot testing in Saint Lucia and St. Vincent and the Grenadines from April 23-May 5, 2018.

Why? - Pilot testing was undertaken as part of the ***Regional Implementation of a VCA in coastal and fishing communities under the Climate Change Adaptation in the Eastern Caribbean Fisheries Sector Project (CC4FISH)***. The goal is to improve understanding of climate change impacts and vulnerabilities for effective adaptation in the fisheries sector. Phase 1 runs from September 2017-July 2018.

Who? - Caribbean Natural Resources Institute (CANARI) is implementing this VCA work in collaboration with Food and Agriculture Organisation (FAO)/Western Central Atlantic Fishery Commission (WECAFC), UWI-Centre for Resource Management and Environmental Studies (CERMES) and national fisheries authorities in five target countries, including Saint Lucia and St. Vincent and the Grenadines.

Pilot testing of VCA tools engaged local residents and resource users from four target communities in Saint Lucia (Canaries and Dennery) and St. Vincent and the Grenadines (Barrouallie and Calliaqua), including fisherfolk and their organisations, farmers, women's and youth groups, private sector and civil society organisations (CSOs) involved in climate change, disaster management and natural resource management, including the National Trust and local Red Cross chapters.

Summary of Key Findings

- The VCA tools tested were suitable for the four target fishing communities in Saint Lucia and St. Vincent and the Grenadines, but the approach needs to be further refined to maximise participation, especially among fisherfolk
- Community stakeholders identified increased coastal erosion, more extreme weather, including rough seas, storms and storm surge, major influxes of sargassum seaweed and warmer ocean temperatures leading to coral bleaching, and shifts in fish distribution as climate change impacts affecting their communities and livelihoods.
- Linked to these impacts, they were concerned about loss and damage to coastal infrastructure like fish landing sites and boats, reduced ability to fish and declines in catch. They also highlighted challenges with marketing and development of fish products, and limited options in terms of insurance, safe equipment storage and alternatives for income generation that contribute to local vulnerability.
- Notably, women were identified as highly vulnerable within these coastal communities due to limited livelihood opportunities, including in fishing.
- Priorities for adaptation in the fisheries sector included use of climate smart fish aggregating devices (FADs), improving access to safe equipment storage and insurance, strengthening local fisherfolk cooperatives and developing alternative livelihoods, especially targeting women.

Pilot testing – Objectives, Approach and Methods

Objectives of Pilot testing

Pilot testing was undertaken to test selected VCA tools in four coastal and fishing communities to inform the draft regional framework and toolkit for VCA developed under the project.

Key Objectives:

- To capture local knowledge and perspectives from a range of community stakeholders to assess climate change impacts, key vulnerabilities and capacity to adapt
- To identify priorities for action on climate change in the target communities
- To build capacity of project partners to conduct VCAs
- To assess the suitability of various VCA tools

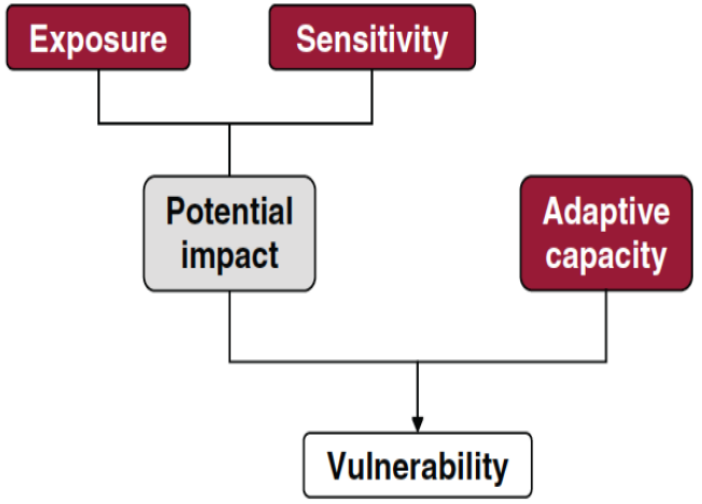
Approach

- VCA is a well known method used to assess, analyse and address the major risks affecting communities, including climate change
- VCA involves a participatory process to allow local residents, resource users and managers, businesses and related organisations to identify their own vulnerabilities, priorities and what they can do to address these issues
- VCA provides a valuable entry point for local adaptation planning and implementation and can inform sectoral and national plans and policies

Source: IFRC 2014

Approach – Framework for Analysis

Vulnerability is determined by the potential impacts due to **exposure** to climatic changes and **sensitivity** of the system to these changes, and the **adaptive capacity** to address the potential impacts of climatic changes.



Source: adapted from IPCC 2007

Key components of vulnerability:

- Exposure - the nature and degree to which system is exposed to significant climatic changes
- Sensitivity - the degree to which the system is affected negatively or positively by climatic changes.
- Adaptive capacity – the ability of the system to adjust to climatic changes to moderate damage, take advantage of opportunities or cope with the consequences

Approach – Key Questions for VCA

- Exposure to climate variability and change – What are the main climate related hazards faced by the coastal and fishing communities?
- Sensitivity to climate variability and change - What are the key impacts resulting from climate related hazards in these communities? Which groups and areas are most affected by these impacts? How are these impacts linked to other environmental, economic and social problems faced by the communities?
- Capacity to adapt - How do communities, including households, resource users and managers and local groups, currently cope with climate variability and change? What are other possible solutions? What capacities/resources are there already to support adaptation?
- Priorities for action - What are the priorities for adaptation, which reduce vulnerability to impacts and build adaptive capacity for climate change?

Methods

1. Four target communities identified in consultation with CC4FISH national focal points and project coordinators based on selection criteria:
   - Canaries and Dennery, Saint Lucia
   - Barrouallie and Calliaqua, St. Vincent and the Grenadines
2. Scoping undertaken to understand the local context and key stakeholders to determine the VCA approach and tools
3. Fieldwork conducted to collect information for the VCA (using interviews, focus groups and community workshops) in four target communities in collaboration with fisheries authorities in Saint Lucia and St. Vincent and the Grenadines from April 23-May 5, 2018

Methods – Selection Criteria for Pilot Sites

1. Selection criteria developed for pilot communities including:

- ✓Dependence on fisheries and marine resources for local economy and livelihoods
- ✓High level of impact and frequency of past climate and disaster events (e.g. hurricanes, storm surge, coral bleaching and flooding)
- ✓Identified in national assessments or reports as priorities for reducing coastal vulnerability to climate change and disasters
- ✓Information is available to facilitate VCA (e.g. technical studies)
- ✓Pre-existing relationships with CANARI, FAO or national fisheries authorities that will facilitate fieldwork
- ✓Local community partners, such as fisherfolk organisations and other civil society organisations, have capacity to engage in and support VCA work

Other factors considered:

- ✓Community has expressed interest in reducing its vulnerability, but no VCA has yet been done
- ✓Unemployment and poverty levels
- ✓Remoteness

Methods - Selected VCA Tools

Selected VCA tools	Approach	Where tested
Rapid community mapping	Stakeholders were facilitated to create their own community maps to illustrate and stimulate discussion on key features and resources that may be at risk from climate hazards, including important assets/infrastructure, livelihood activities and natural resources in the community and key problems and priorities for action	St. Vincent & the Grenadines - Calliaqua, Barrouallie
Hazard/Problem trend analysis	A (matrix) timeline template was used to guide stakeholders to identify and document the key problems or threats affecting fisherfolk and their livelihoods, how they have changed over time (including in environment, socio-economic and governance dimensions), and the resulting impacts. Timeline results were used to analyse the different ways that fisherfolk and the wider community have dealt with key changes and prioritise potential actions needed.	St Lucia – Canaries, Dennery
Key informant interviews	Interview questionnaires containing mostly open-ended questions were developed for (i) key community informants and (ii) fisherfolk mainly to gain insights from stakeholders with specialised knowledge or needs within the fisheries sector and understand institutional dimensions – capacity needs; gaps in the policy and legal frameworks to address climate change; stakeholder relationships/dynamics; decision making on management of fisheries and other resources, climate related hazards and other issues affecting the community.	St Lucia – Canaries, Dennery St. Vincent & the Grenadines - Calliaqua, Barrouallie
Value chain analysis	The fishing activity most important for community livelihoods was used as the basis for developing value chains – participants identified the set of activities (and associated stakeholders) that make up the value chain for the main fisheries in the target communities. This was then used to facilitate more in-depth analysis and stimulate discussion on the key problems/threats, coping strategies and priorities for action for the target community fisheries.	St. Lucia – Canaries

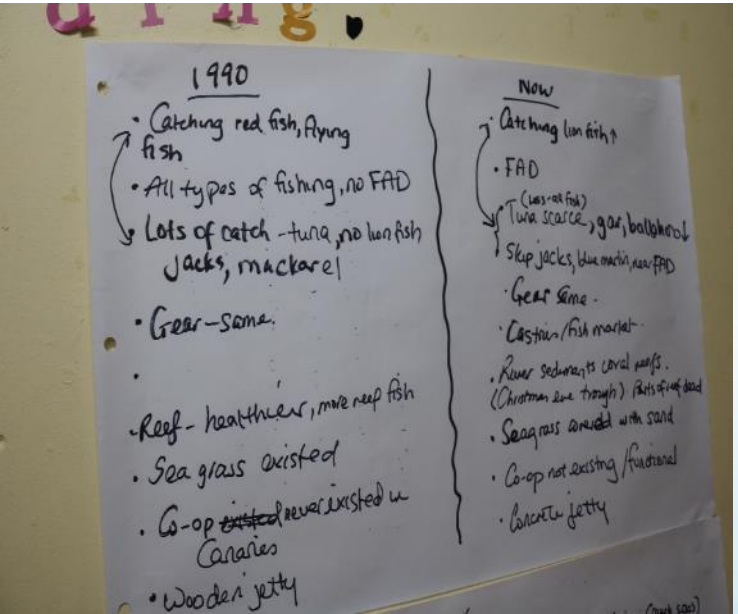
Demographic breakdown of VCA participants

Saint Lucia						
Gender	**Age groups**					**Total**
	Under 20	20-29	30-44	45-60	Over 60	
Males	1	5	17	12	2	37
Females	1	3	10	4	1	19

St. Vincent and the Grenadines						
Gender	**Age groups**					**Total**
	Under 20	20-29	30-44	45-60	Over 60	
Males	0	6	5	5	2	18
Females	0	4	4	1	1	10

*See Appendix for list of participants in interviews, focus groups and workshops

Fisheries stakeholders engaged in pilot testing – workshops and focus groups



VCA Findings

Saint Lucia

Country Profile:

- Saint Lucia is an independent state in the Eastern Caribbean, which covers a total land area of 616 sq. km.
- The island is volcanic in origin with its highest point at Mount Gimie in Canaries which rises to 950 metres; there is a steep rugged interior with a narrow coastal strip.
- The total population in Saint Lucia is 172,623 (50.6% of population is female and 46.9% are under 30 years).
- The majority of Saint Lucia's population lives in the coastal zone, and key infrastructure, including fish landing sites, fish markets, roads, telephone and electricity lines, water lines, airports, homes and hotels are also located in the coastal zone.
- Fisheries are one of the main economic activities of the country in terms of employment and income generation, and contributes to food security and foreign exchange earnings, along with tourism and related services, manufacturing, construction and farming.

Canaries Village

Saint Lucia

- Population: ~1,000 people
- 45% of people living below poverty line; high unemployment
- Main livelihoods/income sources: fishing, farming, government services and remittances
- Limited access to public services (e.g. piped water supply, sanitation, health care, education and public transport)
- Located near mouth of Canaries River on coastal strip surrounded by steep hills
- Fishery: 50-60 full and part-time fishers (5% female), ~20 dugout canoes, target reef fish, coastal pelagics and offshore pelagics using pots, nets, long lining and fish aggregating devices (FADs)

Key Climate Impacts and Adaptation Strategies identified by Canaries Stakeholders

Saint Lucia

Climate related hazards	Key impacts	Coping and adaptation strategies
More frequent rough seas	Damage to jetty, boats and engine Unable to go fishing and earn income Increased concerns over safety at sea Increased use of search and rescue and emergency services, and need for investment in equipment and personnel by Coast Guard, Fisheries Department and Marine Police	Use of cell phones to make emergency calls to coast guard or other fishers Limited use of safety gear (e.g. life jackets)
Hurricanes and storms leading to heavy rainfall, floods and high winds	Flooding alongside river and southern part of village Landslides and soil erosion Damage to crops and livestock Damage to buildings, property and public infrastructure (e.g. bridge, roads, jetty, boats, water pipes, septic tanks, electric lines, telecommunication towers) and disruption of services (e.g. no water for 3 months after Christmas Eve trough in 2013) Sedimentation and damage to coral reefs, seagrass beds and reef based fisheries Unable to go fishing and earn income Depositing sand and building up beach	Created Village Disaster Preparedness Committee to work with Village Council and police to improve preparedness and response, especially for hurricanes, storms and floods Installed flood warning system to alert villagers Slope stabilisation through work by Forestry Department and local CBO, Canaries Community Improvement Foundation (CCIF) Government climate proofing infrastructure, including building retainer wall along river bank for flood protection and raised bridge (but limited community consultation) Collect freshwater from ravines when no access to piped water Coral reef restoration project started by local CBO, CCIF, in collaboration with Fisheries Department
Rising tides and sea levels	Flooding of low-lying coastal areas (only 5m above sea level) Flooding of river when high tide blocks mouth Beach erosion	Relocation where residents, who can afford, have built houses on surrounding hills Building of retainer wall along river bank for flood protection

Impacts = exposure + sensitivity; coping and adaptation strategies = adaptive capacity

Key Climate Impacts and Adaptation Strategies identified by Canaries Stakeholders

Saint Lucia

Climate related hazards	Key impacts	Coping and adaptation strategies
Warmer ocean temperatures and change in currents	Shift in fishing seasons and fish migratory patterns Decline in catch (e.g. reef and coastal and offshore pelagic fish, including flyingfish, gar, skipjack, ballyhoo and conch) Need to go further out to catch fish, which requires more fuel and supplies Coral bleaching	Use of FADs to reduce fishing effort and target higher priced offshore pelagics (e.g. albacore tuna, dolphinfish, kingfish) to offset declines in other fisheries Coral reef restoration project started by local CBO, CCIF, in collaboration with Fisheries Department
Rainfall variability	Sudden, unexpected rainfall leading to waterlogged soils Increase in pests and diseases during wetter than average periods Late rains leading to water shortages for crops Decline in crop productivity (e.g. yam/wild yam, tomato, cucumber, watermelon)	Use of climate resilient crops (e.g. bell peppers can withstand heavy rains) Dig drains on farms as needed Pest management using traditional practices and pesticides Install rainwater tanks and use drip irrigation to address water shortages Use of climate information and other agricultural extension services where available Aquaponics pilot project with local CBO, Sacred Sports Foundation, to diversify livelihoods and reduce dependence on water and fertilisers in farming
Higher air temperatures	Heat stress for crops and livestock Heat exhaustion among fishers (exposed to sun out at sea)	Build greenhouses, especially for tomatoes, to provide shade and control temperature

Impacts = exposure + sensitivity; coping and adaptation strategies = adaptive capacity

Other Key Issues Identified for Canaries Village

Community issues:

- Limited income generation options, especially for women
- Youth delinquency (gambling, substance abuse, etc.)
- Limited organisational and technical capacity within CBOs
- Limited collective action (often due to political divisions)
- Pollution and poor solid waste disposal affecting coastal areas
- Political marginalisation and insufficient investment in area

Fisheries specific issues:

- High fuel costs and difficulty to access as no local fuel station
- Limited access to markets, and poor facilities including abandoned fish market, no cold storage or ice machine
- Limited insurance options for boats/crew
- Targeting undersized fish
- Limited maintenance of FADs
- No active fisherfolk co-operative
- Limited engagement of women in fishing, processing or vending

Stakeholder Priorities for Adaptation in Canaries' Fisheries

Saint Lucia

- **Operationalise the Canaries/Anse le raye Marine Management Area** (CAMMA), which was legally established in 1996, to protect supporting ecosystems for fisheries, including coral reefs
- Establish an **active Canaries branch of Canaries/Anse le raye fisherfolk co-operative** to manage fuel station and fish market, promote savings/pension plan and facilitate insurance coverage
- Promote **livelihood and small business development**, especially for women, targeting value added fish products or new techniques (e.g. aquaponics) through training and micro-financing
- Improve **marketing** (e.g. weekly or monthly "Fish Fri/Creole Pot") and target higher priced/underutilised species
- Enhance emergency services, monitoring and compliance to **promote safety at sea and reduce unsustainable practices** with support of Fisheries Department and Marine Police

Dennery Village

Saint Lucia

- Population: 1,246
- 30% living below poverty line; high unemployment
- Located between Dennery and Trou a l'eau rivers; swamps reclaimed to facilitate expansion of village
- Main livelihoods/income sources: fishing (2nd largest landing site), farming, government services, construction, retail
- Limited access to public services (e.g. intermittent piped water supply, poor sanitation and sewage system)
- Fishery: 400+ full and part-time fishers (13% female), ~30 fibreglass pirogues, target shallow shelf, deep slope, coastal and offshore pelagic fish using pots, bottom lining, long lining and FADs

Key Climate Impacts and Adaptation Strategies identified by Dennery Stakeholders

Saint Lucia

Climate related hazards	Key impacts	Coping and adaptation strategies
Sargassum seaweed influx	Restricts ability to catch fish as gets tangled in lines and nets Limits access to beach for recreation and boat landings due to build up of sargassum and stench when decaying Decaying sargassum releases hydrogen sulphide, which damages boat engines as well as buildings, pipes and appliances as affects copper and other metallic instruments and materials; Need to invest more in repairs and replacing engine parts and infrastructure Health impacts as hydrogen sulphide irritates eyes and respiratory systems, especially among at risk groups like elderly, pregnant women, babies and people with asthma Blocks access for sea turtles to nearby Fond d'Or Beach, which is a protected turtle nesting site Sargassum acts as a FAD attracting young dolphinfish etc. and larger fish that feed on them that benefits fishers; Undersized fish may be caught as bycatch around sargassum	Village Council, which is responsible for regular clean up of beach and fishing port, removes sargassum once build up is not too significant Farmers collect fresh sargassum and use it for fertilizer and pest control as sea salt repels slugs Local enterprise, Algas, in Choiseul collects fresh sargassum, washes and dries it and uses it to produce liquid biogas and fertiliser for sale to local and export markets Requests to national government to remove heavy build up of sargassum using excavators and other heavy equipment, but this can lead to removal of sand and damage beach
Coastal erosion and flooding with storm surge and rising sea levels	Beach erosion Flooding of low-lying coastal areas, especially fishing facilities and older parts of village built along beach and damage to boats and coastal infrastructure Infilling of fishing port and landing site that limits boat access and storage	Relocation where residents, who can afford, have built houses on surrounding hills Building of 2 break waters and 2 revetments along with fishing port in 1997 for coastal protection with support of government and Japanese International Cooperation Agency (JICA)
More frequent flooding of river with heavy rainfall	Flooding alongside river, which impacts significantly on Dennery's primary and secondary schools, and in low-lying coastal areas of village Damage to property and public infrastructure (e.g. schools, roads, septic tanks and soakaways and piped water supply) and service disruptions	Created Village Disaster Preparedness Committee to work with Village Council and police to improve preparedness and response, especially for hurricanes, storms and floods Village Council and Disaster Preparedness Committee have established a flood early warning system to alert villagers

Impacts = exposure + sensitivity; coping and adaptation strategies = adaptive capacity

Key Climate Impacts and Adaptation Strategies identified by Dennery Stakeholders

Saint Lucia

Climate related hazards	Key impacts	Coping and adaptation strategies
Warmer ocean temperatures and change in currents	Shift in fishing seasons and fish migratory patterns Decline in catch (e.g. coastal and offshore pelagic fish including flyingfish, gar, tuna) Need to go further out to catch fish, which requires more fuel and supplies	Use of FADs to reduce fishing effort and target higher priced offshore pelagics (e.g. albacore tuna, dolphinfish, kingfish) to offset declines in other fisheries Dennery Fishermen's Cooperative facilitates fuel tax rebates for boat owners; used to offer fuel credit
More frequent rough seas	Damage to fishing port, boats and engines Unable to go fishing and earn income Increased concerns over safety at sea Increased use of search and rescue and emergency services, and need for investment in equipment and personnel by Coast Guard, Fisheries Department and Marine Police	Use of cell phones to make emergency calls to coast guard or other fishers once within range; However, FAD fishers go out beyond 18-20 miles where no cell phone service Limited use of safety gear (e.g. life jackets) Dennery Fishermen's Cooperative encourages fishers to save for times of crisis/when can't go out
Hurricanes and storms leading to heavy rainfall, floods and high winds	Flooding alongside river and low-lying coastal areas of village Landslides and soil erosion Damage to property and public infrastructure (e.g. schools near river, roads, boats, fishing pots, water pipes, septic tanks, electric lines, telecommunication towers) and disruption of services (e.g. after Christmas Eve trough in 2013) Unable to go fishing and earn income	Created Village Disaster Preparedness Committee to work with Village Council and police to improve preparedness and response, especially for hurricanes, storms and floods Installed flood warning system to alert villagers Established three hurricane shelters at the Dennery hospital, Roman Catholic church and secondary school for villagers Dennery Fishermen's Cooperative encourages fishers to save for times of crisis/when can't go out
Higher air temperatures	Heat exhaustion among fishers (exposed to sun out at sea)	-

Impacts = exposure + sensitivity; coping and adaptation strategies = adaptive capacity

Other Key Issues Identified for Dennery Village

Community issues:

- Limited income generation options, especially for women
- Youth disinterest/delinquency
- Limited organisational and technical capacity within CBOs
- Limited collective action (often due to political divisions)
- Pollution and poor garbage disposal affecting coastal areas
- Loss of forests and wetlands leading to flooding and erosion
- Inadequate investment in area

Fisheries specific issues:

- Poor management and accountability of Fish Marketing Company, their main buyer; Now owes fishers up to $80,000 EC
- High fuel costs
- Poor maintenance of fishing port
- No cold storage or ice machine
- Limited insurance options for boats/crew
- Limited access to fishing gear
- Conflicts over FADs and fish pots
- Weak governance and financial sustainability of cooperative

Stakeholder Priorities for Adaptation in Dennery's Fisheries

Saint Lucia

- Upgrade and install **climate smart FADs**, and develop a FAD management plan to ensure sustainable use of fisheries
- **Climate proofing fishing port and other facilities**, including a ramp to improve boat access and more lockers for safe storage
- Facilitate **access to insurance** and promote savings/pension plan for fisherfolk through Dennery Fishermen's Cooperative

- Improve marketing (e.g. "Saturday Fish Fri") and develop value added fish products (e.g. smoked tuna) to **diversify incomes**, especially for women, through training and micro-financing
- Enhance fishers' capacity and emergency services for **safety at sea** with support of Fisheries Department and Marine Police
- Develop coordinated **clean up campaign and response plan for sargassum** with local CBOs, village council and Fisheries Department

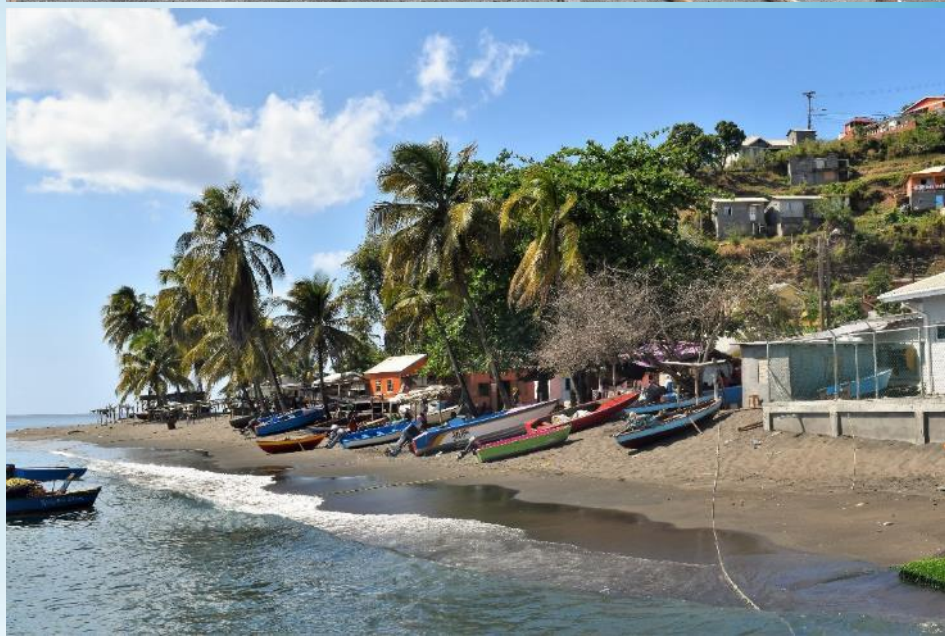
St. Vincent & the Grenadines

Country Profile:

- Saint Vincent and the Grenadines (SVG) is an archipelagic State in the Eastern Caribbean comprised of a chain of 32 islands and cays, which covers a total land area of 389 sq. km.
- St Vincent is volcanic in origin and with an active volcano, La Soufrière, which rises to 1,234 metres and is the island's highest point; there is a steep rugged interior with only a narrow coastal strip.
- Total population of SVG is 110,171
- 85% of SVG's population lives in the coastal zone which is less than 5m above sea level. The majority of infrastructure, including fish landing sites, fish markets, roads, telephone and electricity lines, water lines, airports, homes and hotels are also located in the coastal zone.
- Fisheries are one of the main economic activities of the country in terms of employment generation, contribution to food supply and foreign exchange earnings especially through intraregional trade. Tourism has also become increasingly important.

Barrouallie Village

- The village of Barrouallie, once the capital of St. Vincent, is located on the west coast of the main island
- Noted as having one of highest levels of poverty and unemployment
- Historically, village is prone to multiple hazards including coastal storm surge, landslides originating from the hills above and flooding
- Fishing is the main livelihood in the community with approximately 20 boats and 40 fishers that go out on a regular basis.
- Fishers engage in pot fishing (e.g. for red snapper), seine fishing (e.g. for jackfish, robins) in the nearshore as well as FAD/deep sea fishing focused on tuna, kingfish and dolphin fish.
- Barrouallie is well known traditionally for whaling practices targeting pilot whales or 'blackfish' (but also orcas and dolphins or 'whitefish'). Both men and women are involved in catching, cleaning and preparation (salting, drying) and selling of whale meat and oils.
- Fish and related products are sold locally and in the Kingstown fish market. There is also a monthly "Fish fest" which attracts visitors across St. Vincent to Barrouallie.



Key Climate Impacts and Adaptation Strategies identified by Barrouallie Stakeholders

St. Vincent & the Grenadines

Climate related hazards	Key impacts	Coping and adaptation strategies
Severe weather, storms and hurricanes and related storm surge	• Coastal erosion and flooding, especially with (unexpected) storm surge has been a problem especially for people living right near beach e.g. Bottle and Glass community. Note: there is also natural erosion and changes in beach profile with winds and currents; sand is removed and beach becomes rocky and then sand comes back. • Safety at sea – recently lost 6 fishers due to bad weather • Coral reefs still intact in offshore areas, but in nearshore severely damaged by storms; has led to decline in fish caught in nearshore areas and seine fishers now have to go much further out	• Fisheries Division engaged in some capacity building and safety training with fishers; can access safety gear if successfully completed. • A few fishers have and use life jackets • Active local Red Cross which can help support early warning and disaster preparedness and response. Co-op has potential to assist in sharing of early warning messages • Community has known evacuation centres- located at Government School, Barrouallie Resource Centre and Church of Kingdom Hall. • Fishers may seek more reliable supply at FADs
Rainfall variability	• Changing seasons especially unpredictable rainfall also of increased frequency noted as affecting fishing and farming • Contributes to inland flooding when heavy rainfall - the two rivers in Barrouallie flood; Rivers and drains are often clogged with garbage and silt, which compounds flooding. Structures built close to river banks are prone to flood impacts and occupants sometimes have to be evacuated to shelters • Contributes to landslides / rockfall – mostly affect steep, hilly areas. Past incidents noted where falling rocks resulted in damages to property • Contribute to mosquito borne diseases - Chick-V and Zika; many abandoned boats and other receptacles collect water	• Most of the village is on the hillside and so not that badly affected by rockfalls • Active local Red Cross in village helps support hazard awareness, early warning, disaster preparedness and response/recovery • Town Board has a role in clean-ups and sanitation in the village including clearing drains

Impacts = exposure + sensitivity; coping and adaptation strategies = adaptive capacity

Key Climate Impacts and Adaptation Strategies identified by Barrouallie Stakeholders

St. Vincent & the Grenadines

Climate related hazards	Key impacts	Coping and adaptation strategies
Strong currents/wave action and more frequent rough seas	• Strong currents on west coast has resulted in loss of FADs; One sunk recently but recovered by divers and repaired and put back out • Increased concerns over safety at sea	• Fishers engage in FAD fishing as more reliable source of catch • Fishers have skill and able to help with maintenance of FADS although few currently do so • Limited use of safety gear (e.g. life jackets)
Warmer temperatures and change in currents	• Decline in catch noted over time (e.g. skip jacks and bonito not coming close to shore as in the past), means increased fishing effort. • Changing fishing seasons e.g. for blackfish/whales	• Fishers engage in multiple types of fishing across seasons – e.g. do seine, fishing outside of blackfish season • Opportunities exist to diversify skills and do value added fish products to ensure income in difficult seasons – fillet, smoking, salting, canning etc or focus on underutilised species e.g. Lionfish. New techniques such as aquaculture, seamoss cultivation and aquaponics could also be considered. • Some marketing of fishing and fish products e.g. at monthly Fish Fest including blackfish; need better promotion
Sargassum influx	• Noted as an issue especially big outbreak in 2013; clogs beach and gear. Impacts to fishers with no alternate livelihood options; solely dependent on fishing and impacted by increased downtime if gear and landing sites affected by large influx • Potential to highly impact recreational beach users and blackfish vendors who clean/prepare blackfish on the beach	• Blackfish facility offering opportunity to work near but off the beach (built but currently abandoned as fishers felt inadequate and did not respect traditional process) • Clusters of sargassum noted by fishers as possibly acting as a FAD and contributing to increased catch

Impacts = exposure + sensitivity; coping and adaptation strategies = adaptive capacity

Other Key Issues Identified for Barrouallie Village

St. Vincent & the Grenadines

Community issues:

- Pollution and sanitation issues due to lack of proper sewage system (including where fishers live e.g. Bottle and Glass community), poor waste disposal from blackfish practices and garbage dumping
- Gender inequality and limited opportunities and income generation options for women
- High risks from natural hazards - Inland flooding, landslides, rockfall and mosquito-borne diseases
- High poverty and unemployment levels alongside low education levels
- Political marginalisation and lack of government support and investment in area
- Limited collective action (often due to political divisions)

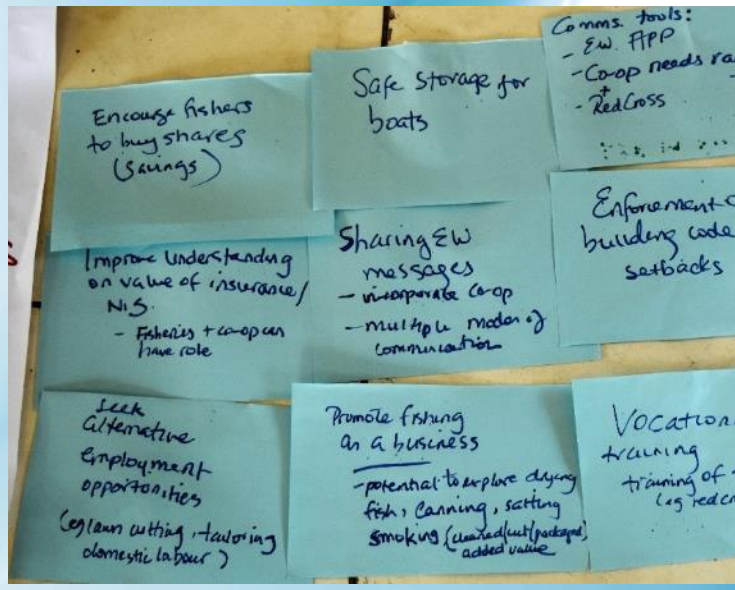
Fisheries specific issues:

- Lack of organisational capacity within Barrouallie fishing co-operative and limited trust related to poor financial accountability and past mismanagement of funds
- Lack of proper/upgraded fish market - existing fish market and blackfish facility abandoned, and difficulty accessing stalls in Kingstown market
- Marketing and price of fish is problematic
- Difficulty accessing fishing inputs - high cost of fuel, no ice machine and poor maintenance/loss of FADs,
- Lack of savings and insurance to cover fishing assets (boats, engines and gear/equipment)
- Targeting of undersized fish
- Limited use of safety gear (e.g. life jackets, radios etc.)
- Unequal pay and recognition for women involved in fishing and selling ‘black fish’

Stakeholder Priorities for Adaptation in Barrouallie's Fisheries

St. Vincent & the Grenadines

- **Organisational strengthening of the fishing cooperative** - Training in financial management, increase awareness of cooperative activities (e.g. through meetings, sharing financial report etc. for transparency and accountability) and expand board membership to include 1-2 young fishers for improved representation
- **Improving the capacity of fisherfolk and support for livelihood diversification** - Promote fishing as a business and explore added value fish products (e.g. drying, salting, smoking) and alternative livelihoods through skills training and micro-financing, especially targeting women



- **Reducing impacts from storm surge and extreme weather –** Ensure safe storage for boats, promote savings plan among fisherfolk and improve insurance access for boats/crew, and improve early warning via equipping fishers, cooperative and Red Cross with communications tools (e.g. radios, mobile apps)
- **Addressing pollution and sanitation issues** affecting coastal and marine areas - Upgrade fishing facilities especially for 'black fish' processing in consultation with fisherfolk, encourage fishers to help in taking blackfish entrails back out to sea for disposal (e.g. providing discounted fuel), improve enforcement and monitoring by public health, police and Fisheries Division (out at sea), and ensure public toilets/baths are accessible 24/7 in areas without piped water and sewage system

Calliaqua Village

- Calliaqua village is located on a narrow strip of coastal lowland in the south of the main island. Its ocean shelf slopes off rapidly on the west coast with a very deep channel (est. 1,800 feet) between Calliaqua Bay and Bequia island in the Grenadines.
- Noted nationally as a storm surge hotspot and under threat from coastal erosion, in-land flooding and land-based sources of pollution
- Main livelihoods include fishing and tourism
- Key fish landing site with the Calliaqua fishing centre reported as being the second most productive landing facility in St. Vincent. Fishers market themselves as providers of freshly caught fish and retail directly, mostly to local buyers as well as to hotels/restaurants.
- Types of fishing include pot fishing and bottom line fishing for queen eye bleim, snapper, sharks and lobster, and FAD/ deep sea fishing for tuna, blue marlin and other pelagics. Divers also catch conch and lobster.
- Village falls within the South Coast Marine Conservation Area (SCMCA), designated in 1987, with a multi-stakeholder management structure being developed under the National Parks, Rivers and Beaches Authority.

Key Climate Impacts and Adaptation Strategies identified by Calliaqua Stakeholders

St. Vincent & the Grenadines

Climate related hazards	Key impacts	Coping and adaptation strategies
Severe weather, storms and hurricanes and related storm surge	• Coastal flooding and coastal erosion from storm surges • Damage to habitats: storm surge generally moves north to south damaging the coral bed and ocean floor on outskirts of the SCMCA e.g. very rare elkhorn reef off of Blue Lagoon Marina already damaged badly by storm surge and is now very broken up. This has led to decline in commonly found fish such as mango snappers. • Loss of beaches especially those near strip of hotels in Villa/Calliaqua including Villa Beach, Indian Bay and Young Island Beach. • Increased concern over safety at sea • Loss and damage to fishers' equipment and gear • Impacts on supporting sectors, like agriculture and food supplies, due to changing seasons and more extreme weather. Impacts on tourism e.g. very poor hotel season in 2017 due to Hurricanes Irma and Maria; drop in visitor numbers and loss in income	• Fisheries Division engaged in some capacity building and safety training with fishers; can access safety gear if successfully completed. • Limited use of safety gear e.g. life jackets. Fishers able to call other fishers or coast guard using cell phones in emergency • Hotel and Tourism association – provide hurricane and disaster preparedness and recovery training to members, including crisis management and communications. Opportunity to encourage joint initiatives and public-private partnerships that can help address impacts • Can leverage relationships of Town Board with disaster agencies – NEMO, Red Cross to help support early warning; currently no proper early warning system or network in place for sharing information/warnings on disasters) • Climate resilience levy sintroduced - $8 per room for hotels in addition to VAT and corporate tax
Warmer ocean temperatures and change in currents	• Used to have a very health reef with lots of fish e.g. barracuda, between Sardine Point and Calliaqua fishing wharf; warmer temperatures are resulting in changes in fish distribution/seasons, coral bleaching and decline in reef health which affects dive tourism • Increased fishing effort - sometimes need to go further out or invest in other types of fishing / diversifying fishing methods and adapting gear used • Changing catch / fish seasons – fishers now getting migratory pelagics such as tuna and seasonal fish such as red snapper at any time of the year	• Fishers use FADs as a more reliable source of catch / income • Fishers engaged in multiple/different types of fishing - FAD, seine etc – some involved in catching crab and lobster • Some alternate livelihood options exist in tourism, farming or other small businesses (e.g. selling coconuts etc.); but can also potentially be impacted by climate change • Opportunities exist to diversify - fish processing to add value to fish products (e.g. fillet, dry and salt, smoke, can fish) or focus on underutilised species e.g. Lionfish. New techniques such as aquaculture, seamoss cultivation and aquaponics could also be considered.

Impacts = exposure + sensitivity; coping and adaptation strategies = adaptive capacity

Key Climate Impacts and Adaptation Strategies identified by Calliaqua Stakeholders

St. Vincent & the Grenadines

Climate related hazards	Key impacts	Coping and adaptation strategies
Strong currents/wave action and more frequent rough seas	• Loss of FADs due to strong currents on west coast; Lost 2 submerged FADs which were not well anchored and ropes were chafing and broke. • More than usual low tides being observed; prevents boats form being moored close to the wharf • Increased concerns over safety at sea	• Fishers made recommendations for securing/anchoring FAD better (but action yet taken by Fisheries Division) • Limited use of safety gear e.g. radios and
Sargassum influx	• Can be a problem where it breaks up and is not in long line or clump that the boats can easily move around. When breaks up, it gets into nets and lines and prevents them from being able to fish properly. Also, gets in engine and causes damage. But when sargassum stays in a line or clump it acts as a FAD and they are able to catch a lot of fish, and they don't mind it. • Recreational beach users and fishers with no alternate livelihood options; solely dependent on fishing and impacted by increased downtime if gear and landing sites affected by large influx of sargassum	• Clusters of sargassum noted by fishers as possibly contributing to increased catch as it acts as a FAD and allows them to catch small Mahi Mahi and amber jack and recognised for potential use as fertiliser. Opportunity to capitalise on this by fishers.
Rainfall variability	• Contributes to inland flooding from three major rivers in the community – Calliaqua River, Ribishi River and Arnos Vale River located further north of Calliaqua (only in very heavy rainfall and tends to be largest river by the Coast Guard jetty as it carries about 80% of flow from Calliaqua area) • Inland flooding is compounded by poor drainage – blocked/clogged and overflow and deforestation due to squatting and illegal development - de-stabilises hillsides and contributes to soil erosion and siltation of the coastal area. • Drought conditions affected the area in 2010 – affecting fishing market/facilities, tourism and hotel establishments that need water for operations and farmers	• Town Board has identified flooding as a key hazard and tried to mitigate effects via cleaning of drains etc if enough funding; currently gets subvention from government • Reservoir built near Calliaqua and there is also increasing use of rainwater tanks so drought less of an issue now

Impacts = exposure + sensitivity; coping and adaptation strategies = adaptive capacity

Other Key Issues Identified for Calliaqua Village

Community issues:

- Pollution and poor waste management (sewage from tourism establishments, yachts, siltation, illegal garbage dumping)
- Loss of mangroves with coastal development
- Inland flooding – poor drainage conditions and high water table
- Limited employment opportunities for women and youth

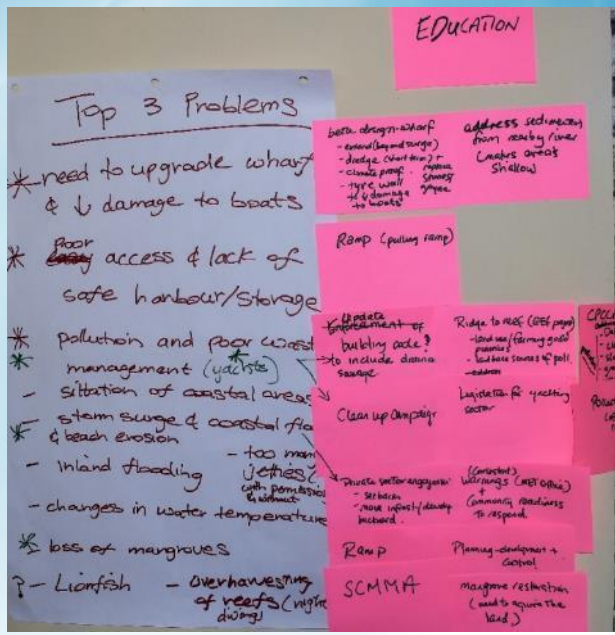
Fisheries specific issues:

- Limited access to wharf/jetty and safe harbour and storage for boats
- Limited organisational capacity within Calfico fishing co-operative, which was recently restarted
- Loss of FADs due to strong currents and wave action
- Fisheries sector not treated as a business; need to professionalise fishing
- Lack of operating standards for handling of fish; need to upgrade fish market facilities
- Marketing and price of fish is problematic
- Lack of insurance to cover fishing assets (boats, engines and gear)
- Difficulty accessing fishing inputs - bait, engine parts and equipment, fuel
- Illegal fishing in SCMCA and targeting of undersized fish
- Lion fish invasion
- Limited opportunities and engagement of community, including fisherfolk and Calfico, in management of coastal and marine areas including via co-management of SCMCA

Stakeholder Priorities for Adaptation in Calliaqua's Fisheries

St. Vincent & the Grenadines

- **Climate proofing fishing infrastructure and facilities** – Build a pulling ramp and better designed jetty, which extends beyond surge, to accommodate more boats, replace stones/groyne, dredge to address sedimentation
- **Strengthening the fishing cooperative to provide better services to fishers** - Establish a fuel station at cooperative to improve access to fuel, improve access to hooks and fish bait, and support marketing so fishers can get better prices
- **Promoting a more professional and resilient fishing sector** - Fishers need better support from Fisheries Division, Cooperatives Division and National Development Fund for business development, including training, small grants and loans
- **Managing pollution and waste** - Engage villagers in river and beach clean up campaigns, improve maintenance to address drainage and sewage issues and update legislation, regulations and building codes related to pollution and waste management, especially targeting hotels and unregulated yachting sector
- **Addressing storm surge and coastal erosion and flooding** - Engage private sector to enhance compliance with coastal setbacks, discourage adhoc coastal development and improve early warning system and community disaster readiness
- **Strengthening the SCMCA and its management** – Enable a "ridge to reef' approach involving mangrove restoration, coral reef conservation, slope stabilisation and soil management with farmers in upstream areas to build coastal resilience.



Lessons in Applying VCAs in the Fisheries Sector

- Appreciate that each coastal and fishing community is unique, and tailor VCA approach to local context
- Link VCA to concrete actions for adaptation and resilience building at the community level, and ensure community participants understand what is in it for them, explaining why they were engaged and what are next steps where they/their inputs will likely be included or used.
- Integrate the cultural, ecological, institutional, political and socio-economic aspects of vulnerability and capacity to adapt in VCA recognising that fisheries are a complex social-ecological system
- Recognise climate change as one among many risks and drivers of change in communities
- Take into account capacity and resource constraints among fisherfolk and fisheries authorities in designing VCA
- Capacity building of fisheries authorities and other agencies and civil society organisations (CSOs) can be enabled by engaging them in VCA for hands-on training
- Ensure that facilitators of the VCA process are neutral, and are perceived as such, given the underlying political conflicts and tensions within many local communities
- In planning and scheduling VCAs consider appropriate timing – factor in holidays, hurricane season, tourist seasons, specific fishing seasons which may be of interest

Lessons in Applying VCAs in the Fisheries Sector

- In depth scoping exercise should be used to gather information on the community, identify gaps and VCA designed to fill these gaps (e.g. drawing on grey literature and input from fisheries extension officers and project staff working in community)
- Comprehensive stakeholder identification and analysis and effective mobilisation are key for a participatory VCA process:
  - Use local community mobilisers (individuals or CBOs that are well trusted and networked in the community/fisheries sector) to identify target stakeholders, including champions and community leaders, and provide background/history of the community and how they traditionally operate
  - Provide mobiliser with information on objectives, tools and expected outcomes in advance to engage stakeholders, limit misinformation and set expectations for the process from outset
- Applying multiple tools (2-3 per community) allowed for validation of data collected and a more nuanced picture of vulnerability on the ground. In particular key informant interviews were complementary and added depth to data collected from other tools, including community mapping, trend analysis and value chain analysis, in focus groups/ workshops
- To maximise participation, it is key to select venues and formats for meetings that are easily accessible and tailored to the target audience - meeting fisherfolk where they are (e.g. at landing sites and markets) and ensuring an atmosphere where stakeholders feel comfortable (e.g. recognising if participants are not able to read/write or feel intimidated in formal setting)

Next Steps

- Findings to be communicated and shared with local and national authorities and CSOs in Saint Lucia and St. Vincent and the Grenadines to inform climate change policies, plans and projects in the four pilot communities
- A regional workshop will be held in Bridgetown, Barbados on July 2-3, 2018 to present the findings and lessons learned from the pilot testing and review and finalise a regional framework and toolkit for VCAs in the Eastern Caribbean fisheries sector based on stakeholder input

Moving Forward: Key Recommendations

For phase 2 of regional implementation of the VCA in 5 target countries, it is recommended to:

- Review VCA design
  - Refine the tool selection process - carefully identify specific expectations and information for the VCA to capture and select and/or adapt the most appropriate tool to support this process
  - Be conscious of stakeholder preferences and constraints (e.g. fisherfolk generally have limited time and interest in participating in day-long workshops; need for gender segregated groups) and design fieldwork accordingly
  - Develop a vulnerability and capacity profile to enable cross-comparison and prioritisation across communities
  - Consider development of communications products as an explicit part of the process to share VCA results effectively
- Refine the planning and mobilisation process and expectations
  - Undertake more in-depth scoping and stakeholder analysis, supported by in-country community mobiliser/s and fisheries focal points and extension officers to help coordinate information gathering. Identify and communicate specific information needs for VCA e.g. other projects in the communities, how communities traditionally operate, and conflicts
  - Explore options to ensure recommended community mobilisers can be adequately dedicated for the time period of the assessments and are adequately compensated for same
- Provide capacity building in participatory approaches for effective stakeholder engagement and VCA process for fisheries authorities, including fisheries extension officers, other relevant agencies and CC4FISH national project coordinators

Acknowledgements

Special thanks to the:

- local mobilisers, Agnita Thomas and Mary St. Ange in Saint Lucia and Christobelle Ashton in St. Vincent and the Grenadines, for their guidance and support to CANARI for fieldwork
- fishing communities of Canaries and Dennery in Saint Lucia and Barrouallie and Calliaqua in St. Vincent for their participation and input into the VCA process and willingness to share their knowledge and perspectives

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Additional resources can be accessed at this dropbox link, including interview questions and lists of interview, focus group and workshop participants