CAN CHECKLIST

LOCAL ASSESSMENT

The Nature Conservancy

Resilient Islands

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

International Federation of Red Cross and Red Crescent Societies

CADRIM
Red Cross Caribbean Disaster Risk Management Reference Centre

Contents

THE COMMUNITIES ADAPTING WITH NATURE (CAN) CHECKLIST

The Communities Adapting with Nature (CAN) Checklist **provides useful guidelines that will help identify risk-reduction benefits that adjacent habitats deliver to a community that is at risk to natural hazards and climate change**. These references offer suggestions on how to integrate natural ecosystems within a participatory framework for achieving community risk reduction. Through application of the CAN Checklist, communities can subsequently identify local priority areas that will lead to the design of adaptation measures, specifically for implementing nature-based solutions. These methods are directed to facilitators from civil society organizations, government agencies, and local governments, and are designed to better understand and capture the interactions/connection between communities and adjacent natural ecosystems when addressing risk reduction. Ultimately, the goal is to better integrate the natural environment when designing and implementing Disaster Risk Reduction (DRR) strategies within a community.

Who should use this guide?

This guide is designed for use by facilitators of community risk assessments and others who are involved in decisions related to climate change adaptation and risk reduction. Users may belong to civil society organizations, government agencies, local governments, and communities. The checklist assists those participating in the eVCA, 3CA, VCA, CBHFA (the assessments) or similar processes, to ensure that nature-based analysis is included in community participatory risk assessments. It is hoped that the principles found in this guide will lead to the adoption of ecosystem-based solutions where applicable. The CAN Checklist, together with the assessments, serve to guide and bolster grass-root climate change adaptation decisions.

What is Climate Change Adaptation?

It is the adjustment of people and nature to actual or expected climate effects[1]. People and nature can adapt to climate change through different strategies, such as: income diversification, adapting or changing crops less susceptible to changes in climate, building culverts, channels, dams or walls; movement of natural environment to better-suited areas, relocation of people, establishment of biological corridors to allow species to displace, support networks for disaster risk reduction, or ecosystem-based adaptation (EbA).

What is Climate Risk?

Climate Risk[2] is determined by the exposure to hydrometeorological hazards (e.g. floods, winds, precipitation changes, extreme temperatures, etc.), and the vulnerability of societies to those hazards. Climate Risk considers social, economic, political, governance and cultural influences. Figure 1 indicates

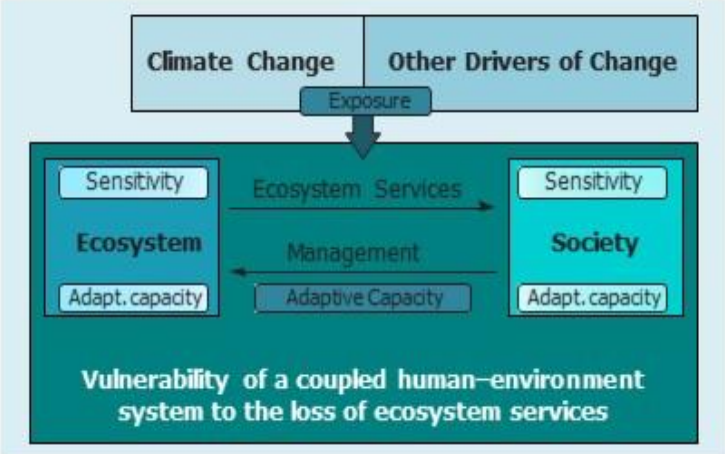

Figure 1: Adopted from UNFCCC, 2011 and Locatelli 2008.

[1] IPCC, 2014:4
[2] Based on the definitions from the UN Office for Disaster Risk Reduction (UNDRR) and the Intergovernmental Panel on Climate Change (IPCC)

that the level of climate risk is determined by[3] (i) the exposure of ecosystems and society (degree in which a hazard is experienced); (ii) the sensitivity of those groups (characteristics that influence the likelihood to experience harm); and (iii) the adaptive capacity (anticipate, cope with and respond to climate impacts) of each supported by factors such as: numbers of people living in high risk zones; availability and security of energy, water and food supplies; types and diversification of livelihoods; effective management of protected areas; healthy condition of ecosystems; normal flow of ecosystem services; and level of social cohesion.

Climate Change Effects

The table below summarizes some of the effects of climate change in terrestrial and coastal areas.

Climate Change Impact	Area impacted	Climate Change Effect
Sea level rise	Beaches Coastal communities	Erosion Salt water intrusion Loss of beach/land Coastal flooding
Increased precipitation	Urban areas Rural areas	Flooding Changes in precipitation patterns Short, intense periods of rainfall Stronger hurricanes
Higher temperatures	Coastal areas Terrestrial areas	Warmer oceans Drought Heat waves Water stress Frost-free season (and growing season) will Lengthen
Increased carbon dioxide in the atmosphere	Oceans	Ocean acidity rising

Approaches to Climate Change Adaptation

There are several approaches or actions a specific community can take to address and respond to climate risks, one option being Climate Change Adaptation (CCA). Examples of CCA include: 1) a community relocating to higher grounds, 2) built flood protection infrastructure, 3) establishing a well-functioning early warning system, or, 4) if located in a coastal area with habitats providing protection services, evaluating their conservation status or effective management and/or restoration potential for coastal protection.

Various studies[4] indicate that up to 65% of the increase in projected economic losses due to climate change could be averted through timely adaptation. However, many conventional approaches to climate change have proven to be very expensive and limited in effectiveness as standalone interventions. On the other hand, many recent studies[5] conclude that ecosystem-based interventions can be among the most cost-effective solutions for both climate change mitigation and adaptation.

What is Ecosystem based Adaptation (EbA)?

Ecosystem based Adaptation (EbA) is defined as "The use of biodiversity and ecosystem services to help people adapt to the adverse effects of climate change[6]." Ecosystems are "a dynamic complex of plant, animal

[3] For more information on Vulnerability, see: Margles Et Al. 2016. Assessing Vulnerability: an Integrated Approach for Mapping Adaptive Capacity, Sensitivity, and Exposure. Climatic Change. Vol.136: 615 – 629.
[4] The Climate Group. 2014. Climate Adaptation: Seizing the Challenge
[5] Nichols. 2019. Collaborative Science to Enhance Coastal Resilience and Adaptation. Frontiers in Marine Science. Vol. 6.
[6] Definition by the U.N Convention of Biological Diversity (CBD)

and microorganism communities and their nonliving environment that interact as a functional unit"[7].
Ecosystem Services, are the benefits obtained by people from ecosystems[8] and include:

(1) protection services for disaster mitigation coastal protection
(2) supporting services such as productivity or biodiversity maintenance
(3) provisioning services such as food, fiber or fish
(4) regulating services such as climate regulation or carbon sequestration
(5) cultural services such as tourism or spiritual and aesthetic appreciation

EbA uses sustainable management, conservation, and the restoration of ecosystems to build resilience. This is achieved through the reduction of hazard or vulnerability exposure by maximizing the services natural ecosystems provide (Figure 2). EbA can also provide co-benefits, including habitat for food species, pollination for agricultural productivity, among other benefits.

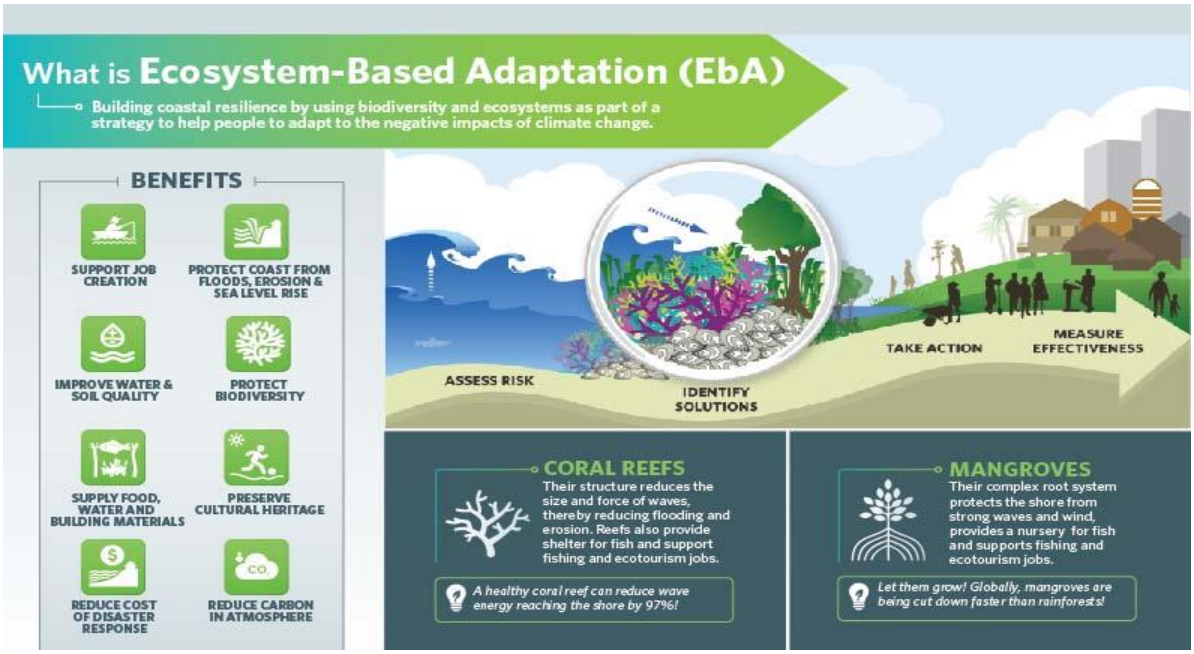

Figure 2. What is Ecosystem-Based Adaptation (EBA) infographic produced by The Nature Conservancy and International Federation of Red Cross and Red Crescent Societies with funding from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

The United States Agency for International Development (USAID) has defined six[9] common categories of EbA activities, listed in Table 1.

EbA Activity	Purpose and main benefits	Examples and links
Establishing and managing protected areas	Healthy ecosystems can contribute to a community's protection and the reduction of their climate risks. In addition, the protection of these habitats contribute to conservation co-benefits, including resting areas for migratory birds, important spawning	Protecting floodplains, coral reefs, mangroves, and other ecosystems can safeguard people and property from floods and storm surge as well as maximize the ecosystem services these provide[10].

[7] Definition by IUCN
[8] Some ecosystems are: coral reefs, mangroves, seagrass beds, beaches and sand dunes, wetlands, forested watersheds, and rivers
[9] Additional references and case studies have also been developed by IUCN https://www.iucn.org/downloads/iucn_eba_brochure.pdf
[10] 2016. WAVES. https://www.wavespartnership.org/en/knowledge-center/managing-coasts-natural-solutions

	and aggregation sites for commercial fish species, among others.	
Supporting integrated land-use and marine spatial planning	Complimentary land and marine spatial planning will help to regulate development to reduce climate risk and contribute to the sustainable use of the natural resources of the community. Development planning must be supported by an effective institutional structure, legislation and regulations. These regulations and policies can also localize restoration or protection in specific areas that can be sensitive and key to reduce climate risk.	Using Integrated Coastal Zone Management to develop plans that include the following management goals: maintain/restore wetlands, maintain sediment, preserve coastal land/development (including infrastructure), maintain shorelines utilizing "soft" measures, maintain shorelines utilizing "hard" measures, invasive species management, preserve habitat for vulnerable species, maintain water quality, and maintain water availability. You can learn more about MSPs by going to these sites: https://marineplanning.org http://caribbean.cepal.org/content/integrating-watershed-and-coastal-areas-management-iwcam
Restoring Ecosystems	Restoring and recovering natural habitats strengthens the capacity of these systems. Healthy ecosystems provide important contributions to reduce climate risk and reduce hazards.	Mangrove and coral restoration in coastal environments and forest restoration in watersheds are a prime example of this activity. With high percentages of coral reefs and mangroves loss globally, the Nature Conservancy's Caribbean Division has focused on restoring these important ecosystems.[11]
Supporting ecosystem-based livelihoods	There are specific livelihood activities that are particularly vulnerable to climate hazards (eg. shifts in temperature and extreme weather events). Livelihoods practices often contribute to ecosystem degradation. Among these activities include agriculture, cattle farming, fishing, aquaculture, among others. The management of natural resources on which community livelihoods depend can therefore reduce climate risks, building resilience.	Sustainable fisheries projects increase social, ecological, and economic resilience to climate change, by improving the management of natural resources on which livelihoods depend, reducing pressure on fish stocks, increasing household food security. Similarly, the sustainable management of grasslands and rangelands can enhance pastoral livelihoods and increase resilience to climate-induced drought and flooding.
Building green infrastructure	The building of "green infrastructure," defined by USAID as an "engineered intervention that uses natural processes to create healthier built environments for people and the natural resources that sustain them."	Green infrastructures and roofs in cities are an example of how green infrastructures can contribute to flood reduction, and therefore reduce climate hazards, in this case, flooding due to strong storms.[12]
Implementing agroforestry and conservation agriculture	Sustainable agriculture practices avoid further ecosystem damage, increase economic and social benefit for farmers and other users, and increase resilience.	An example is agroforestry, which can protect crops from storms and reduce demand for water during droughts by integrating trees and

[11] Our Caribbean.
https://connect.tnc.org/northamerica/caribbean/Caribbean%20Content%20Library%20Documents/The%20Nature%20Conservancy%20-%20Our%20Caribbean.pdf
[12] https://www.nature.org/en-us/what-we-do/our-insights/perspectives/envisioning-a-great-green-city/

		shrubs with crops and animal farming systems.[13]

Relationship between EbA and Nature-based Solutions

EbA is considered as a type of Nature-based Solution (NbS), defined by the IUCN as "Actions to protect, sustainably manage and restore natural or modified ecosystems, that address society challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits." EbA uses biodiversity and ecosystem services to reduce the risks associated with climate change. Although both concepts (EbA and NbS) are used interchangeably, **the main difference between them is that EbA addresses climate change, while NbS is a more inclusive, broad term addressing both climate change and non-climate change related situations.**

The table below classifies several strategies; ecosystem-based and/or nature-based that can be implemented in a community (note that all ecosystem-based solutions are also nature-based solutions, but not the other way around).

Strategy	Ecosystem-based approach	Nature-based solution
Improvement in the management of an upland protected area responsible for delivering water to a mayor city through a strategy such as reforestation	✓	✓
Stabilization of dredged material placement areas and confined disposal facilities using native plant communities	✗	✓
Implementation of a well-functioning early warning system	✗	✗
Restoration of mangroves to reduce shoreline wave energy exacerbated by climate change	✓	✓
Mandate a driving restriction policy to mitigate traffic congestion and reduce greenhouse gas emissions	✗	✗
Reparation of a canal that traditionally conveyed water to a more functional solution with an adjacent green park	✗	✓
Living shoreline for erosion protection of waterfront properties in a coastal community from climate change	✓	✓
Construction of a hybrid coral reef structure involving both built infrastructure and live coral in an area previously degraded by climate change	✓	✓

EbA for Risk Reduction

Unfortunately, the health of the environment and its capacity to provide these services is rapidly degrading. The unsustainable use of natural resources in addition to insufficient baseline data and funding for effective

[13] https://www.nature.org/en-us/about-us/where-we-work/latin-america/colombia/stories-in-colombia/our-work-in-colombia-lands/

resource management, exacerbates communities' vulnerability and exposure, and consequently their overall risk to climate change.

As governments and communities seek long-term adaptation approaches, prioritizing EbA can significantly improve the health of nature, restore their protective services and contribute toward disaster risk reduction and sustainability goals. The United Nations Framework Convention on Climate Change (UNFCCC) notably recognizes EbA approaches in their National Biodiversity Strategies and Action Plans under the Convention on Biological Diversity and Nationally Determined Contributions.

As can be observed from figure 2 above, coastal ecosystems such as mangroves, saltmarshes, coral reefs, barrier islands, and sand dunes can protect the coastline by increasing the intensity and size of waves during strong storms, hurricanes, and tsunamis. Coral reefs alone have been found to absorb an average of 97% of wave energy, most of it (86%) by the reef crest[14]. Riverine ecosystems, such as marshes, lakes floodplains, and peatlands can help mitigate floods that regularly impact communities. In addition, communities facing recurrent landslides and soil erosion benefit from reforestation and/or restoration activities of forest ecosystems since these have been shown to reduce the aforementioned risks as well as mitigate droughts and floods.

The CAN Checklist Process

How is the CAN Checklist applied?

The CAN Checklist is designed to be applied during any process when adjacent habitats are being considered for reducing a community's risk to natural hazards and climate change and increasing its resilience. This includes any participatory community risks or climate change assessment.[15] During this stage, the reference materials in the CAN Checklist are to be used as guidance for understanding the relationship between a community and their natural environment.

The CAN Checklist is an important part of the planning process and can be integrated at all levels. This includes a variety of stages, from strategy development and community engagement[16], to project monitoring, evaluation and learning. With the reference information included in the CAN Checklist, communities and organizations can identify the short and long-term strategies to pursue resilience-building, discern the specific activities necessary to reach that goal, and develop the set of metrics necessary to measure performance and evaluate impacts.

Knowledge requirements Before Starting

It is recommended that the facilitator applying the CAN Checklist has basic knowledge on climate change adaptation and ecosystem-based adaptation. Additionally, it is highly recommended that the facilitator has obtained some background information on climate change impacts, disaster risk reduction, and climate change adaptation through several resources, such as the Red Cross Campus online courses[17]. The facilitator works alongside community members, local and central government stakeholders, external advisors, among others, to share concepts within the community, and collect the necessary information to apply the assessment.

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[14] Ferrario, Et Al. 2014. The Effectiveness of Coral Reefs for Coastal Hazard Risk Reduction and Adaptation. Nature Communications. Vol. 5.
[15] In the case of the International Federation of the Red Cross and Red Crescent Societies (IFRC) Road map to Community Resilience, the CAN Checklist should be applied in the 2nd stage, where risks are being assessed and a community's resilience is being measured e.g. during the Enhanced Vulnerability and Capacity Assessment (eVCA) and its complement, the Caribbean Climate Change Adaptation (3CA).
[16] Community Engagement and Accountability (CEA) entails a circular process from the initial consultations with communities to their involvement in sharing and evaluating lessons from the engagement.
[17] Those leading the application of the CAN Checklist should have basic climate change knowledge that can be accessed through online courses on: Red Cross campus (https://www.campuscruzroja.org/enrol/index.php?id=43).

CAN CHECKLIST

The CAN Checklist is designed to identify and collect specific information necessary to evaluate possibilities and the applicability of EbA approaches in a community. It provides a list of elements to verify through three main sections: 1) Background Information, 2) Disaster Risk Reduction Assessment, and 3) Ecosystem-based Adaptation. Before planning an EbA approach for a community, the facilitator should carefully review the list of elements in order to consider important data collection requirements. Additional resources, such as the 3CA tools, can be useful when going through the CAN Checklist.

Table 1. Communities Adapting with Nature Checklist

Background information		
Categories	Elements to verify	Methodologies/3CA tool
Define the target community	☐ Population size: ☐ Type: Capital, industrial, tourist, colonial, commercial, port city, other. ☐ Location: Coastal, riverside, island, intra-mountainous, valley, highlands, watershed or micro watersheds, areas neighboring the capital city, periphery of a metropolis, micro regions, boundaries, other. ☐ Density Population: concentration and dispersion ☐ Governance levels: Community participation in decision-making, social inclusion.	Secondary data: national census, population and economic reports, Human Development Report at national and local levels, urban poverty maps, and geographic and contour maps. GIS maps of enumeration districts and the associated attribute data Semi-structured surveys with community members, key (national and local government) stakeholders
Analyze the socio-economic situation and culture of the area	☐ Local social dynamics: Degree of organization, beliefs and customs, literacy level, social cohesion, formal and non-formal leadership, population origin, local languages, age, informal settlements (squatters), and relevant dates (such as religious festivities, year-end). ☐ Economic / Livelihood activities: main economic activities, food provision, touristic areas, commerce, production systems, legal status of the property, land tenure.	Document review, Census, Household surveys, Poverty assessments etc. Livelihood survey & stakeholder analysis, seasonal calendar National surveys with income and/or economic information. Interviews with institutions, elderly inhabitants, focus groups, universities.
Understand community land use planning and/or zoning and its relationship with Climate Change adaptation.	☐ Existence of territorial and/or marine zoning plans that are drafted, in place and enforced, and construction codes both with and without risk reduction and/or climate change adaptation considerations. ☐ Development plans with comprehensive management approach to risk reduction and/or climate change adaptation. ☐ Municipal ordinances in place and/ or enforced, environmental policies, legislation established for emergencies and disasters.	Review of documentation - national physical development policy documents, environmental change certificate studies and approvals, national studies on climate change and national CC policy. Coastal zone, watershed or forest studies for the area. Agricultural and squatter

	□ Land tenure, legality, informal settlements, squatters. □ Areas proposed or declared under all nationally-determined protected status (i.e. protected, parks, reserves, etc.)	regularization documents. Aerial photographs, current and past of the study area. legal advice, Historical profiles. Transect walks. Interviews or contacts with government officials at national, metropolitan, congress, and province/departmental levels. Ministries/Departments of Planning, Environment, Coastal, Agriculture, and Water Resources. Focal groups with local level government officials and grassroots community-based organizations.

Disaster Risk Reduction Assessment		
Community DRR preparedness	□ Existence of national and community level DRR plans. □ Existence of maps with DRR information (shelters, evacuation routes, etc.). □ Presence of a functioning early warning system in the community.	Semi-structured interviews and data compilation from national and local DRR authorities and entities within the country's DRR system
Gather historical information on the effects of climate change in the community	□ Major climate related events: droughts, storms, hurricanes, tornados in the last 5, 10, 20, 50, 100 years. Main changes and effects in people and nature. Physical environment, agricultural and health effects	Post-disaster reports for the area. Historical references to rare but severe events. Internet and newspaper searches on past impact events in the area. Environmental and sector studies. Semi-structured interviews and data compilation from community members (historical profiles) as well as national and local DRR authorities and entities within the country's DRR system.
Analysis of climate change or DRR national and local-level interventions	□ Existence of local-level physical (grey) interventions planned or implemented for DRR and/or climate change interventions (sea walls, sand re-nourishment, relocation of communities, etc.).	National and local DRR authorities and entities within the country's DRR system. Works authorities/ministries reports for the area. CC

		forecast for the country and area.

Ecosystem-based Adaptation		
Gather local-level/community maps with current habitat presence	□ Existence of benthic habitat[18] maps. □ Maps of ecosystems and ecosystem service provision for the target area. □ Maps of biodiversity corridors, endangered or protected fauna. □ Maps of areas under protected status (i.e. protected, parks, reserves, etc.)	Ministries/Departments of Planning, Environment, Agriculture, and Water Resources. Coastal zone, watershed or forest studies for the area. Semi-structured interviews and data compilation from community members (historical profiles) as well as ministries and national and local organization related to planning and natural resources.
Analyze the dependency of livelihoods with ecosystems	□ Main activities that use, are located or interact to the ecosystems identified for the area. □ Economic relevance for national and local economy: $USD and % of local economy, % GDP.	Data compilation from national and local studies, ministry reports, multilateral analyses. Livelihood survey, participatory mapping & stakeholder analysis
Assess the level of knowledge of community members and ecosystem services provided	□ Level of understanding and knowledge of Ecosystems and Ecosystem Services concepts. □ Ecosystem Services provided: fisheries, coastal protection, tourism, carbon sequestration, others.	Knowledge attitude and practice survey. Semi-structured interviews and Focal Groups.

[18] Benthic habitat: are those habitats connected with, or living near, the sea bottom.

GLOSSARY

1. Adaptation: The process of adjustment to actual or expected climate and its effects. In human systems adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate and its effects.
2. Adaptive Capacity: captures the sometimes intangible elements of a community which predict how flexible individuals may be in anticipating, responding to, coping with, and recovering from climate impacts.
3. Benthic habitat: are those habitats connected with, or living near, the sea bottom.
4. Climate: Climate in a narrow sense is usually defined as the average weather and more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The relevant quantities are most often surface variables such as temperature, precipitation and wind.
5. Climate Change: Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. The United Nations Framework Convention on Climate Change (UNFCCC), in its Article 1, defines climate change as: 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods'.
6. Climate Risk: Risk resulting from climate change and affecting natural and human systems and regions.
7. Ecosystem: An ecosystem is a functional unit consisting of living organisms, their non-living environment and the interactions within and between them. In the current era, most ecosystems either contain people as key organisms, or are influenced by the effects of human activities in their environment.
8. Ecosystem Services: Ecological processes or functions having monetary or non-monetary value to individuals or society at large. These are frequently classified as (1) supporting services such as productivity or biodiversity maintenance, (2) provisioning services such as food, fiber or fish, (3) regulating services such as climate regulation or carbon sequestration and (4) cultural services such as tourism or spiritual and aesthetic appreciation.
9. Eco-DRR: The International Union for Conservation of Nature (IUCN) cross-cutting theme to refer to Ecosystem based approaches to disaster risk reduction (Eco-DRR). It refers to projects that ensure the sustainable management, conservation and restoration of ecosystems to contribute to disaster risk reduction. This term has been established to identify efforts that integrate ecosystem management, sustainable livelihoods and disaster risk reduction at regional and global level throughout IUCN offices.
10. Exposure: The degree to which a community experiences threats.
11. Habitat: According to the IUCN, it is the locality or environment in which an animal lives.
12. Flood Plain: A nearly flat plain along the course of a stream or river that is naturally subject to flooding
13. Hazards: The potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. In this Checklist, the term hazard usually refers to climate-related physical events or trends.
14. Mitigation: efforts to reduce greenhouse gas emissions and enhance sinks.
15. Nature based solution: Actions to protect, sustainably manage and restore natural or modified ecosystems, that address society challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.
16. Resilience: The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation.
17. Risk: The potential for consequences where something of value is at stake and where the outcome is uncertain. Risk is often represented as probability or likelihood of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur.

18. Sensitivity: the characteristics of a community that influence its likelihood to experience harm under a given stressor scenario (e.g., storm, drought, sea level rise).
19. Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

ACRONYMS

1. CAN: Communities Adapting with Nature
2. EbA: Ecosystem-based Adaptation
3. DRR: Disaster Risk Reduction
4. 3CA: Caribbean Climate Change Adaptation (3CA) Toolkit
6. eVCA: Enhanced Vulnerability and Capacity Assessment
5. VCA: Vulnerability and Capacity Assessment
6. CBHFA: Community-based Health and First Aid
7. CCA: Climate Change Adaptation
8. NbS: Nature based Solution

Additional Guidance on the EVCA tools:

Before starting, the facilitator should review the definition of ecosystems and the services provided by ecosystems, under the *What is Ecosystem-based Adaptation* heading.

1. *Direct observation and transect walk:* before the direct observation and transect walk, the facilitator and participants should observe, review, and annotate the different ecosystems present in the community as well as the ecosystem service benefits provided. As participants walk, they should write down (if applicable) the ecosystems visited/observed; its perceived condition (healthy or not healthy/degraded); perceived stressors (i.e. human activity - such as pollution, extraction, burning – or natural hazards); the services provided (from CAN Checklist – supporting, regulating, or provisioning); and the relationship of the ecosystem with the community (extractive, recreational, etc.).

2. *Semi-structured interview:* The facilitator will convene a focused community discussion to better understand perceived ecosystem services, primary stressors to the ecosystems, and the relation between the community and the ecosystems. If internet connection is available, it is suggested to access: http://maps.coastalresilience.org for reference on the location of ecosystems in a map of each geography when starting the discussion. If internet connection is unavailable, the facilitator can use supporting printed maps. Before starting, ensure that the community recognizes the geographic area being shown and validates the ecosystems presented.
   A semi-structured interview can involve key experts including: police, tourist guides, farmers, fishers, older members of the community, teachers, local leaders, religious leaders as well as persons with specific trades related to the habitats. It is important that minorities are well-represented, including the elderly and women or persons with disabilities.

Guiding questions to support those under the EVCA are as follows:

a. What ecosystems are found within and around the community?
b. What benefits (i.e. services) are provided by ecosystems to your community?
c. Whose livelihoods and which livelihoods are most dependent on these ecosystems?
d. Have these ecosystems changed throughout the years (increase or decrease / degrade or restore)? Why has this occurred?
e. What have been the impacts during a hurricane / storm in the different identified ecosystems (including plants and animals)?

3. *Focus group discussion:* The facilitator can be the interviewer and/or discussion leader who won't need to follow a structured survey questionnaire but will introduce general topics to facilitate a discussion. A focus group should encompass the following participants:
   a) Community members involved in extractive industries (fishermen, farmers, artisans, other);
   b) Community development related groups (neighborhood board, development associations, church groups);
   c) Formal private sector;
   d) Authorities/government (municipal officials, local environmental authority, local fishing and agriculture representatives, and military leaders).

It is important that minorities are well-represented, including the elderly, women and persons with disabilities. If there is no social cohesion within the community, it is recommended that several focus groups are conducted or identify the connectors that will encourage more inclusive participation in a seamless manner.

Before starting, the facilitator should review the definition of ecosystems and ecosystem services. If internet connection is available, it is suggested to access http://maps.coastalresilience.org for reference on the location of ecosystems in a map of each geography when starting the discussion. If internet connection is unavailable, the facilitator can use supporting printed maps. Before starting, ensure that the community recognizes the geographic area being shown and validates the ecosystems presented.
The questions listed below are provided to stimulate the discussion:

a. What ecosystems are found within and around the community?
b. What changes have you noticed throughout the years in those ecosystems?
c. Have those changes affected the way you conduct your business/form of employment?
d. Does your sector/group benefit (i.e. services) from ecosystems; if so, how?

4. *Livelihoods Analysis*: The application of this tool will provide critical information on the dependence of the community with their natural environment, among other information. Please review with the community the definition of ecosystem services so that they gain an understanding on how they might depend on their surrounding habitats.

5. *Historical Profile*: The historical profile aids in providing a succinct 'story of the community' in a chronological listed way. It is a key complement to other tools such as the semi-structured interview, focus groups, and/or secondary data collection. The facilitator should gather information on the past (100, 50, 20, and 5 years) ecosystems/habitats present in the area and the changes the community has seen in each. It is also recommended to obtain information on the major climate related events (i.e. droughts, storms, hurricanes, tornados) in the last 5, 10, 20, 50, 100 years and how they impacted people and their surroundings and habitats (such as the total destruction of a mangrove area or sand deposits in different areas of the coastline). To maximize the contributions using this tool, it is important to ensure that the elderly or persons who have lived in the community for a long time are present and engaged.

6. *Participative Mapping:* It is suggested to use participatory 3D Mapping (P3DM), which is a community-based mapping method that collects and compiles local spatial knowledge to create 3-dimensional georeferenced relief models. This process that combines local and scientific knowledge can be valuable for communities to better understand and appraise the risks of different hazards in their environment. It also facilitates the identification of vulnerable people, delineate hazard-prone areas, identify shelters and other important infrastructure, and locate local resources to face stressors.

Information assessed in P3DM models can include, but not be limited to:

- Identification of ecosystems
    - Mangroves

    - Coral Reefs
    - Seagrass
    - Beaches and sand dunes
    - Rivers
    - Cliffs

- For coastal communities
    - Sea level rise scenarios
    - Erosion
    - Storm Surge
    - Historical storm surge (reference past storms the community has faced)
    - Historical flooding and droughts

- For inland communities
    - Historical flooding (reference past storms the community has faced) and / or landslides
    - Historical flashfloods
    - Historical droughts

- Infrastructure (roads, landmarks)

- Ecosystem services[i]:
    - Agriculture
    - Fisheries
    - Tourism
    - Recreation
    - Coastal Protection
    - Water source

- Critical infrastructure (hospitals, schools, police station, fire station, and shelters)

[i] Simplified method to assess ecosystem services (it could be used, however, it is not mandatory) http://www.birdlife.org/worldwide/science/assessing-ecosystem-services-tessa