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WEST AFRICA BIODIVERSITY AND CLIMATE CHANGE (WA BiCC)

Review of Coastal Adaptation Practices in
Developing Countries

(April 2020)

This work was conducted under the USAID-funded West Africa Biodiversity and Climate Change (WA BiCC) project. The report was prepared by the Center for International Earth Science Information Network (CIESIN) of the Earth Institute of Columbia University under contract with Tetra Tech.

This publication was produced for the United States Agency for International Development by Tetra Tech ARD, through a Task Order under the Prosperity, Livelihoods, and Conserving Ecosystems (PLACE) Indefinite Quantity Contract Core Task Order (USAID Contract No. AID-EPP-I-00-06-00008, Order Number AID-OAA-TO-11-00064).

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Citation: Trzaska, S., E. Boytinck, A. de Sherbinin, S. Smith, and Anne-Laure White. (2020). *Review of coastal adaptation practices in developing countries*. Report published under contract with Tetra Tech for the USAID West Africa Biodiversity and Climate Change (WA BiCC) project.

Cover Photo: The village of Moable, Sierra Leone, July 2016. Credit: S. Trzaska

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EXECUTIVE SUMMARY

This report reviews best practices in coastal adaptation in developing countries. The review analyzes end-of-project and mid-term evaluations of 17 coastal adaptation projects from tropical regions in Africa, Asia and Pacific, and Latin America and the Caribbean performed by entities independent of implementing and funding agencies. It also reviews climate adaptation work of the West Africa Biodiversity and Climate Change (WA BiCC) project in two coastal “learning landscapes”.

The projects reviewed in this report cover coastal adaptation activities that can be grouped into seven broad categories:

1. Agriculture and Fisheries
2. Coastal Defenses
3. Ecosystem rehabilitation
4. Alerts, Education & Communication
5. Transportation
6. Waste management
7. Water security

The sample represents the range of activities undertaken in most developing countries (see section 2.3 for examples). Note, however, that none of the projects focused on relocation of households or settlements, but instead they addressed protection measures that in theory will help communities to remain in place. This could be potentially tied to the overall reluctance of the populations to relocate, as highlighted in one of the projects. However, investigation of future and current projects for which evaluations are not yet available indicates that relocation may be more widely implemented in more recent projects.

In order to evaluate and compare a wide variety of projects with various objectives and designs, the analysis used a comprehensive set of 37 criteria stemming from nine practices identified by “The Adaptation Good Practices Checklist”, compiled by Care International with input from a wide array of institutions and experts specializing in adaptation. Those practices fall in the following categories:

1. Risk, vulnerability and capacity;
2. Participation, inclusion and gender;
3. Climate information and uncertainty;
4. Planning and decision-making processes;
5. Innovation, local and indigenous knowledge and technology;
6. Adaptive management;
7. Institutional linkages;
8. Learning, capacity building and knowledge management, and
9. Scaling up and sustainability.

Coastal adaptation projects were evaluated based on the degree to which each of the criteria were fulfilled, using a three-point scale to guide a subjective evaluation and facilitate a comparative analysis of all projects.

MAIN RESULTS

Individual projects implemented between 1 and 5 activities, as defined by the categories above. Ecosystem-based adaptation and Alerts, Education & Communication were the most commonly implemented activities (in 14 out of 17 projects) while Coastal Defenses, Waste management and Transportation were implemented in fewer than one third of the projects.

No project achieved a maximum score on all practices/criteria. Best performing projects obtained maximum scores in four practices, but most projects satisfactorily implemented only one or two practices. Projects in the lowest tier of the scale did not obtain a maximum score on any of the practices. Similarly, no practice was addressed in a satisfactory way across all the projects. Practice 'Risk, vulnerability and capacity' was the best implemented of all practices, but even for this practice only four projects received the maximum score. Most practices were well implemented in two projects at most. This highlights the breadth of focuses and approaches of projects in coastal adaptation and the lack of a well-established set of practices, common to all projects. With this in mind the overall best performing projects according to the set of criteria used here were:

1. Haiti - Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti implemented by the UNDP under the Global Environmental Facility (GEF). This project focused on development of Agriculture and Fisheries, Alerts, Education & Communication, Water Security and Ecosystem-based adaptation activities.
2. Sao Tome - Adaptation to Climate Change implemented by the World Bank under the GEF. This project focused on Coastal Defenses and Alerts, Education & Communication activities.
3. Cuba - Reduction of Environmental Vulnerability implemented by UNDP under the GEF. The project was exclusively devoted to Ecosystem-based adaptation.

The lowest ranking projects were located in Tuvalu, Bangladesh and Mozambique and focused respectively on four to five among all the activity categories.

There was no relationship between the type or the number of activities and overall practice ranking – neither implementing a more comprehensive set of activities nor focusing on fewer activities did lead to better outcomes in terms of adaptation practices.

Certain practices or individual criteria/activities in this evaluation seem to be well internalized and implemented across the projects while a few activities were systematically under-implemented. Activities related to participatory aspects, inclusion and diversity, feedback loops and flexible planning seem to have been less well implemented in majority of the projects. Best-performing projects usually addressed these activities better than the other projects while performing similarly in the other, better implemented areas.

SUMMARY CONCLUSIONS

The main conclusions by practice are:

1. **Risk/Vulnerability and capacity** – These criteria were generally well addressed. Projects that performed particularly well in this category required implementers to undertake comprehensive assessments to understand the social, ecological, and economic factors underpinning vulnerability.

They had a detailed understanding of the needs of different stakeholders before project design even began. Best performing projects in this practice were located in **Cambodia, Guinea, Haiti and Samoa**.

2. The **participation, inclusion, and gender equality** practice had the most “partially fulfilled” score but also a high percentage of projects not addressing them at all. Projects that performed well in this practice devoted time and effort to create highly participatory practices with an explicit gender focus that went beyond the inclusion of women and towards a feminist implementation. In addition, projects designed policies that were pro-poor and considered wealth variations in their target communities, rather than treating the community as a monolithic group. Top-scoring projects in this category were located in **Mexico and Thailand**.
3. **Climate Information**-related criteria were poorly addressed. This highlights the fact that coastal adaptation projects focused mostly on addressing the adverse effects of climate change impacts and did not include the reinforcement of climate services or capacity building of communities. Projects that performed well in this practice supported Meteorological Services and provided comprehensive training to build the capacity of local actors for the ongoing creation, interpretation, and dissemination of climate information. Some projects created risk reports that could be sent out to fishermen or farmers in an accessible way. Best performing projects in this practice were located in **Sao Tome and Haiti**.
4. **Planning and decision-making practice** showed a contrasting picture, with some criteria well implemented (appropriate planning level and identification of options) but others remaining poorly addressed (flexible planning and screening processes). Projects that performed well here had flexible plans and budgets that allowed them to adapt to a local and changing context. They often integrated their projects into the national development plans and worked closely with governments at multiple levels. Adaptation options were selected through a clear screening process. The best projects in this practice were located in **Sao Tome and Haiti**.
5. **Innovation, local knowledge, and technology** practice were generally well accounted for, except the use of local and indigenous knowledge and technologies. Projects that performed well implemented traditional forms of knowledge into the design, focusing specifically on innovations that had a good chance of replication and building the capacity for communities to use these technologies equitably in the long term. They also partnered with local universities. Best projects were located in **Thailand and Cuba**.
6. **Adaptive management** had a very split performance between the criteria, with most of the projects failing to include social and environmental safeguards. Projects that performed well here avoided maladaptation by setting clear social and environmental safeguards that were respected in design. They did not predetermine all the activities during preparation, thus allowing for flexibility to adapt to the expressed needs and actual capacities of local communities. Best projects were located in the **Caribbean and Sao Tome**.
7. **Institutional linkages** were in general well incorporated in most of the projects. Projects that performed well created multi-stakeholder forums that included representatives from the public and private sectors, as well as civil society groups and NGOs. They also prioritized inter-ministry cooperation on the multi-sectoral aspects of climate change. Highest scoring projects were located in **Senegal and Haiti**.
8. **Learning, capacity building, knowledge management** criteria had high variability in their performance. While most of the projects did well in the M&E and capacity building the

implementation of continuous reflection and feedback loops and related resource allocation were not implemented in most of the projects. Projects that performed well benefited from lessons learned in other relevant projects operating in similar environments and created community-based M&E structures that informed decision-making processes within the projects. Monitoring systems were robust and used for project improvement, rather than simply for reporting. Best performers in this practice were located in **Sao Tome and Tanzania**. The WA BiCC project (Section 5) is notable in its use of learning to inform policy and practice.

- 9. Scaling up and sustainability** practice was in general well addressed, except the cost-benefit analysis, nonexistent in most projects. Projects that performed well in considerations built local capacity and ownership at both local and national levels, including both top-down and bottom-up approaches. They also included a cost-benefit analysis in their project design to ensure project sustainability. **Caribbean, Cuba and Samoa** were the best performers.

RECOMMENDATIONS

Whether implementing a wide array of adaptation activities or having a narrow focus, coastal adaptation projects could benefit from improved participation of communities and stakeholders at all stages of the project, beyond the design, and from flexible project implementation. This could potentially lead to improved responsiveness of the projects to local needs and insure improved sustainability and overall outcomes. Such activities would need to be planned in the design phase of the project and “The Adaptation Good Practices Checklist” could be a good resource to ensure that all the aspects of good practices in adaptation are taken into account. Coastal adaptation projects could also improve their use of climate information as an adaptation tool.

I.0 INTRODUCTION

The West African Biodiversity and Climate Change (WA BiCC) project's second component focuses on building resilience of coastal areas of West Africa. The coastal zone is home to about one-third of the region's population, with an annual growth rate of about four percent (de Sherbinin *et al.* 2014). A very large proportion, about 42%, of West Africa's GDP is generated from its coastal areas. More than 1.6 million tons of fish are legally captured in West African waters each year, with an estimated wholesale value of US\$2.5 billion. The coast hosts major cities, ports, agro-industries, fisheries, and offshore petroleum exploration and production. Its high population growth rates reflect its economic vibrancy and attractiveness.

Climate change will exacerbate existing physical, ecological/biological, and socioeconomic stresses on the African coastal zone. Many coastal nations of West and Central Africa have low-lying coasts that are susceptible to erosion and hence are threatened by sea level rise, additionally exacerbated by potential rise in storminess, leading to increased frequency of impactful storm surges and extreme wind events. Populations living in these areas will be impacted in two ways: through the potential loss of habitable area due to land loss and salinization; and through impact on their livelihoods since changes in temperature and rainfall patterns will affect fisheries upon which coastal communities rely.

Adaptation is ongoing in many coastal areas of the tropics, whether through locally led initiatives, government projects, or donor driven activities. Given the number of projects, it is important to take stock of on-going activities to inform future projects. This report is an attempt to identify projects in coastal areas in the tropics that addressed the various aspects of adaptation to climate change. It is based on a desk study of end-of-project and mid-term evaluation and as such presents the major caveat of not being able to assess the sustainability and longer-term outcomes of the projects in the field. The authors hope, however, that it is a useful first step in identifying current best practices in project design and implementation that can be useful for future projects.

The report is structured as follows: Section 2 describes the overall approach, project selection and description of the coastal climate adaptation activities undertaken by each of the projects and evaluation methodology. Section 3 gives an overview of the main results in their aggregated form while section 4 details the results by practice. Section 5 describes WA BiCC coastal adaptation activities, and Section 6 summarises the results.

2.0 METHODOLOGY

2.1 PROJECT SELECTION AND OVERALL APPROACH TO EVALUATION

This report is based on a desk review of project-related documents available on-line. The initial intent was to review both peer-reviewed and grey literature, but the number of peer-reviewed articles on coastal adaptation projects was small. Thus, this analysis only reviewed projects available through databases of organizations such as United Nations Development Program (UNDP) and the World Bank, as well as the Global Environmental Facility (GEF), the Adaptation Fund, and the Green Climate Fund. While some projects had significant documentation, the degree to which a project could be evaluated based on the documentation provided varied greatly, from final evaluations to mid-term evaluations to project proposal documents. The latter, often referred to as “Prodocs”, were not included in the final analysis as they did not provide any assessments of what was actually implemented. Only terminal and mid-term evaluations, carried out independently from the funding and/or implementing agencies were considered as they allowed us to understand both what the projects set out to achieve and what they actually did achieve with some objectivity. The projects selected are described in the next sub-section; a list of projects can be found in Table 1. The activities implemented under each project are detailed in section 2.3 and a summary by project is included in table2.

Evaluation criteria for this wide array of projects with different scopes and approaches to project implementation needed to be comprehensive to accommodate the diversity. After research, “The Adaptation Good Practices Checklist”, published by the CARE Climate Change & Resilience Information Centre in 2016 (CARE 2016), was chosen as it was compiled to guide the design and implementation of climate change adaptation projects. The criteria were derived through an analysis of the UNFCCC Paris Agreement and a range of adaptation approaches, reflecting previously published work of a similar nature. Several research and policy institutions, including the CGIAR Climate Change Agriculture and Food Security programme (CCAFS), the Climate Change Directorate of the Ministry of Environment and Natural Resources in Kenya, the Africa Centre for Technology Studies (ACTs), the Pan African Climate Justice Alliance (PACJA), the Climate and Development Knowledge Network (CDKN), the International Research Institute for Climate and Society (IRI) of Columbia University, and the World Resources Institute (WRI), were actively involved in the development and testing of the Adaptation Good Practices Checklist. Given the involvement of multiple global stakeholders and the extensive nature of the criteria, the Adaptation Good Practices Checklist was deemed comprehensive and suitable for our purposes. The details of the criteria are presented in section 2.4.

2.2 OVERVIEW OF THE PROJECTS EVALUATED

In total, 17 coastal adaptation projects were included in the analysis, 12 through their terminal evaluations and 5 through their midterm evaluations.

Projects budgets ranged from \$1.7 million to 13.7 million, with an average of \$6.1 million. The average completed project length was 5.3 years, with a minimum duration of 3 years and a maximum of 8 years. Of projects evaluated, 8 were from Africa, 5 were from Asia and the Pacific, and 4 were from Latin America and the Caribbean.

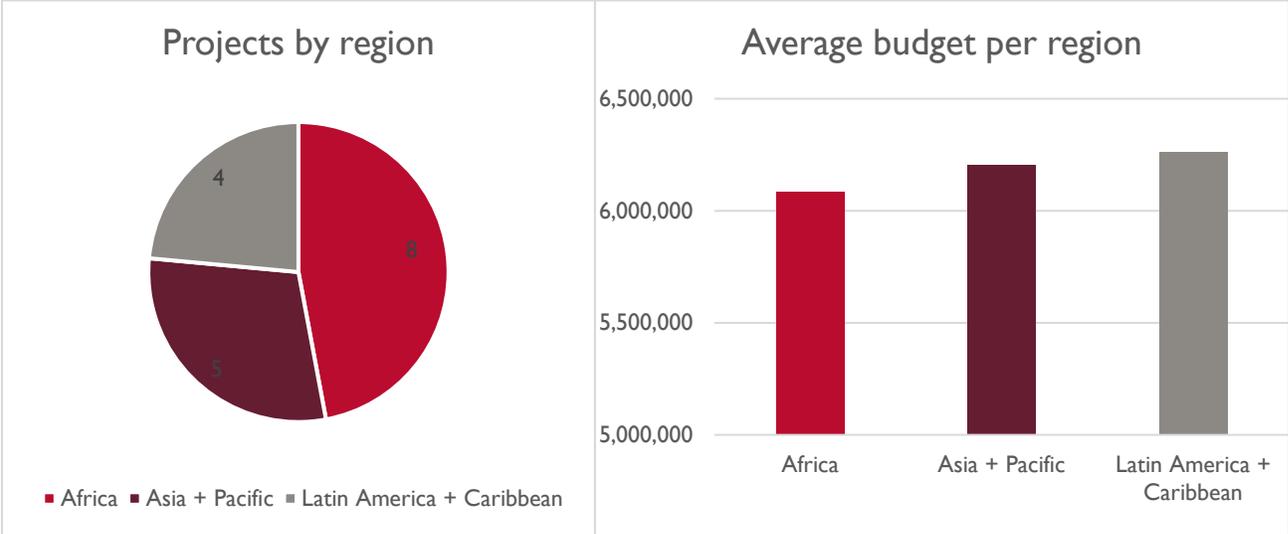


FIGURE 1: DISTRIBUTION OF PROJECTS BY REGION AND AVERAGE PROJECT BUDGET BY REGION.

An overview of projects examined in the final analysis is present in Table I.

The details and links to the projects on the internet are provided in the reference list.

TABLE 1: SUMMARY OF THE PRINCIPAL CHARACTERISTICS OF THE PROJECTS SELECTED FOR THIS REPORT, INCLUDING: PROJECT TITLE, COUNTRY OF IMPLEMENTATION, REGION, FUNDING OR IMPLEMENTING AGENCY, PROJECT BUDGET AND DURATION, TYPE OF DOCUMENT SUPPORTING THE ASSESSMENT, PROJECT CODE USED IN THIS REPORT.

Project Title	Country	Region	Implementing Agency	Status	Project Budget (USD)	Duration	Evaluation type	Code
Adaptation in the Coastal Zones of Mozambique	Mozambique	Africa	UNDP	Completed	1703416	5	Terminal	Moz
Implementing NAPA priority interventions to build resilience in the most vulnerable coastal zones in Djibouti	Djibouti	Africa	UNEP	Completed	1880646	7	Terminal	Dji
Sao Tome - Adaptation to Climate Change	Sao Tome and Principe	Africa	MARAPA, Dir. Geral do Ambiente, CONPREC, Institute Nacional da meteorologia, Dir. das Pesca	Completed	4322943	5	Terminal	Sao
Adaptation to coastal erosion in vulnerable areas	Senegal	Africa	Centre for Ecological Monitoring	Completed	8,619,000	3	Terminal	Sen
Increased Resilience and Adaptation to Adverse Impacts of Climate Change in Guinea's Vulnerable Coastal Zones	Guinea	Africa	UNDP	Completed	4296558	5	Terminal	Gui
Responding to Coastal Climate Change and Its Human Dimensions in West Africa	West Africa	Africa	UNDP/ UNESCO	Completed	13729517	4	Terminal	Wes
Implementation of concrete adaptation measures to reduce vulnerability of livelihoods and economy of coastal communities of Tanzania	Tanzania	Africa	UNEP	Mid-term	5008564	0	Mid-term	Tan
Climate Change Adaptation Programme in the Coastal Zone of Mauritius	Mauritius	Africa	UNDP	Mid-term	9119240	0	Mid-term	Mau
Vulnerability Assessment and Adaptation Project for Climate Change in the Coastal Zone of Cambodia	Cambodia	Asia + Pacific	UNEP	Completed	5830000	5	Terminal	Cam
Increasing Resilience of Coastal Areas and Community Settlements to Climate Change in Tuvalu	Tuvalu	Asia + Pacific	UNDP	Completed	3049007	5	Terminal	Tuv
Strengthening the Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events	Thailand	Asia + Pacific	UNDP	Completed	3613863	5	Terminal	Tha
Community Based Adaptation to Climate Change through Coastal Afforestation in Bangladesh	Bangladesh	Asia + Pacific	UNDP	Mid-term	10500000	0	Mid-term	Ban
Enhancing resilience of coastal communities of Samoa to climate change	Samoa	Asia + Pacific	UNDP	Mid-term	8040000	0	Mid-term	Sam
Adaptation to Climate Change Impacts on the Coastal Wetlands in the Gulf of Mexico	Mexico	Latin Am + Caribbean	World Bank	Completed	4050000	6	Terminal	Mex

Project Title	Country	Region	Implementing Agency	Status	Project Budget (USD)	Duration	Evaluation type	Code
Implementation of Pilot Adaptation Measures in coastal areas of Dominica, St. Lucia and St. Vincent & the Grenadines	Caribbean	Latin Am + Caribbean	World Bank	Completed	2030000	6	Terminal	Car
Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti	Haiti	Latin Am + Caribbean	UNDP	Completed	13380000	8	Terminal	Hai
Reduction of Environmental Vulnerability	Cuba	Latin Am + Caribbean	AMA del CITMA	Mid-term	5592000	0	Mid-term	Cub

2.3 OVERVIEW OF COASTAL CLIMATE ADAPTATION ACTIVITIES

Coastal adaptation projects reviewed here include many different types of activities, ranging from community-led activities requiring few resources to highly technical, resource-intensive measures requiring governmental involvement. Examples of adaptation practices include a number of activities, such as coastal wetland protection and restoration, structural shoreline stabilization, community-based disaster risk reduction, improved mariculture practices, and coastal watershed management (USAID 2009).

For the 17 projects reviewed in the following sections, the activities observed in the projects were clustered into seven broad categories:

1. Agriculture and Fisheries
2. Coastal Defenses
3. Ecosystem-based
4. Alerts, Education & Communication
5. Transportation
6. Waste management
7. Water security

Table 2 summarizes which projects engaged in different types of activities, and Annex I provides the list of activities specified in each of the project documents. Projects located in the same region are grouped together. In general, ecosystem-based activities and activities involving alerts, education & communication were most commonly observed, with more than 80% of projects engaged in activities in each of these categories. Ecosystem-based activities focus primarily on mangrove restoration and/or coastal reforestation. Only the projects in Mexico and Mauritius included other ecosystem-based measures (coral reef restoration), and these projects also devoted substantial attention to coastal reforestation. Activities directly related to improving transportation were only implemented in two projects and waste management was another less frequent activity.

Each of these areas is discussed below, approximately in the order of frequency with which projects addressed them.

Activities in the **alerts, education & communication** category include the development or improvement of early warning systems, as well as specific activities to educate community members about climate risks, available adaptation measures, and evacuation procedures. Educational activities (e.g. community workshops) often involved attempts to engage stakeholders in other adaptation activities included in the project. Several projects also included improvements to communications infrastructure (e.g. radio networks, monitoring stations) as a means of deploying early warning systems and facilitating community evacuation in the event of a natural disaster.

TABLE 2. MATRIX OF ACTIVITIES BY PROJECT

Project Location	Agriculture & Fisheries	Coastal Defenses	Ecosystem- based	Alerts, Education & Communication	Transportation	Waste management	Water Security	Number of Activities in each project
Mozambique	✓		✓	✓		✓	✓	5
Djibouti	✓		✓	✓		✓	✓	5
São Tomé & Príncipe		✓		✓				2
Senegal	✓	✓		✓		✓		4
Guinea	✓		✓	✓	✓			4
West Africa			✓					1
Tanzania		✓	✓	✓		✓	✓	5
Mauritius			✓	✓				2
Cambodia	✓		✓	✓				3
Tuvalu	✓	✓	✓	✓			✓	5
Thailand	✓	✓	✓	✓	✓			5
Bangladesh	✓		✓	✓			✓	4
Samoa		✓		✓			✓	3
Mexico	✓		✓	✓		✓	✓	5
Caribbean	✓		✓				✓	3
Haiti	✓		✓	✓			✓	4
Cuba			✓					1
<i>Number of projects implementing the activity</i>	11	6	14	14	2	5	9	

The focus on **evacuation** is particularly notable given the absence of resettlement activities in any of the 17 projects. Interestingly, this is despite the fact that many ecosystem-based activities include some type of land use restrictions (e.g., establishment of protected areas), presumably requiring at least some households to resettle. In the Tanzania project, reviewers note that project planners overlooked the possibility that some households would need to relocate in order to implement ecosystem-based policies. No other review makes provisions for resettlement, either as a result of the prescribed adaptation measures or as a means of adaptation in itself. An excerpt from the project in Sao Tome and Principe may provide insight into the lack of attention to relocation-based activities:

Given the relatively small size of the villages' population, relocation appeared initially the most cost-effective option. However, it was rejected due to its profound socio-cultural impacts as well as sustainability concerns (as households would likely relocate again in areas at risk). Instead, the project chose a protection strategy, accompanied by long-term incentives in the form of a

gradual spatial relocation of centers of economic activity. (Adaptation to Climate Change Project: Sao Tome and Principe).

More recent projects under the World Bank West Africa Coastal Adaptation (WACA) Program have introduced plans for resettlement of threatened communities, including the resettlement of 2,000 coastal inhabitants in Sao Tome and Principe. The Sao Tome and Principe communities opted for planned relocation over coastal protection infrastructure, perceiving relocation as the best long-term solution to sea level rise and coastal erosion. Similarly, a WACA project in Senegal plans to relocate households in high risk zones on the Lange de Barbarie adjacent to Saint-Louis and provide assistance to those already displaced by the erosion of the peninsula. While at the time of this review reports from these projects were not available, correspondence with project leads suggests that planned relocation may be more widely used in the future.

Activities in **agriculture & fisheries and water security** categories were also utilized by a majority of projects. Agricultural adaptation measures most frequently involved the deployment of new agricultural management practices (e.g. agroforestry), transitions to more drought- or saline-resistant cultivars of existing crops and use of more efficient agricultural technologies (e.g. drip irrigation). Activities involving fisheries adaptation were less common, though ecosystem-based adaptation measures such as mangrove restoration may provide co-benefits to fisheries by means of habitat provisioning. Activities explicitly focused on fisheries included the adoption of an integrated approach to fisheries management (Caribbean) as well as mariculture development and livelihood diversification, as in the establishment of aquaculture facilities in Guinea and Bangladesh.

While the sample size of projects reviewed remains too small to draw any statistically significant conclusions about regional preferences, **water security** activities seemed to be of particular, though not exclusive, interest to Small Island Developing States (SIDS) in the Caribbean and Pacific. Projects involving water security activities differed substantially in the scale at which they were deployed. Many projects focused on the installation of rainwater capture systems, digging of boreholes, and repairs to existing cisterns at community and household levels, while others involved more nationally-orchestrated approaches, such as the artificial recharge of aquifers in Djibouti, or the adoption of integrated watershed management policies in Haiti.

Activities in the categories of **coastal defenses, transportation, and waste management** were utilized by fewer than half of the projects reviewed. Most projects with activities in the **coastal defenses** category tended to utilize soft interventions (dune nourishment, sand fixation) either exclusively or in concert with hard interventions. Hard infrastructure interventions were often concerned with limiting salt water intrusion into agricultural lands, such as the construction of seawalls near rice fields in Senegal, as well as the use of concrete-lined barriers around pulaka cultures in Tuvalu. Elsewhere (Senegal, Tanzania), seawalls were constructed or repaired to protect communities and large infrastructure projects (e.g. roads, buildings) from coastal flooding.

In some projects, reports referenced educational activities instructing community members in the use of soft engineering methods, without confirming whether these methods had been deployed. In addition, several projects included coastal mapping to assess the viability of coastal barriers in the future but had not implemented measures at the time of the report. While projects were only determined to include coastal defenses when it was clear that such measures had been deployed, it is possible that small-scale

soft adaptation measures are more widely used than is evident from the reports, and/or that hard adaptation measures will become more prevalent in the future.

Improvements to **transportation** infrastructure were the least commonly observed but were implemented as a means of facilitating evacuation and promoting livelihood diversification. The Thailand project included procurement of life jackets and dredging of canals as a means of allowing evacuation boats access to communities at risk of flooding. The Mozambique project included the construction of climate-proofed roads to facilitate evacuation and livelihood diversification.

Finally, activities in the **waste management** category most often included municipal efforts to implement solid waste management systems (Mexico, Tanzania, Djibouti) in order to improve the quality of littoral waters. Some community-based efforts were also observed, such as the construction of public latrines and the repurposing of animal waste for feed in raised fish-farms in Mozambique.

2.4 SELECTION OF CRITERIA AND EVALUATION METHOD

The criteria developed in The Adaptation Good Practices Checklist include nine categories, or practices:

1. Risk, vulnerability and capacity
2. Participation, inclusion and gender
3. Climate information and uncertainty
4. Planning and decision-making processes
5. Innovation, local and indigenous knowledge and technology
6. Adaptive management
7. Institutional linkages
8. Learning, capacity building and knowledge management
9. Scaling up and sustainability

Each of the practices had between four and five focused criteria for evaluation for a total of 37 criteria. An overview of the practices and their associated criteria can be found in the table below. More detailed description of each criterion, as provided by the original document is included in section 4, dedicated to evaluation by practice.

TABLE 3. SUMMARY OF THE PRACTICES AND RELATED CRITERIA FROM THE ADAPTATION GOOD PRACTICES CHECKLIST AND THEIR CODES USED IN THIS REPORT.

Practice	Criteria	Code
1. Risk, vulnerability and capacity	Climate vulnerable people are targeted	Risk_vul
	Comprehensive assessments and risk surveillance systems	Risk_stud
	Institutional mapping	Risk_inst
	Analysis results informs planning	Risk_plan
2. Participation, inclusion and gender	Risk analysis involves a diverse range of social groups of people	Part_risk
	Mechanisms for vulnerable groups to continually engage	Part_vul
	Gender equality is an explicit goal	Part_gen
	The rights and agency of the full range of actors are strengthened	Part_div
3. Climate information and uncertainty	Meteorological services a produce relevant climate information	Clim_sys
	Climate information responds to information needs of actors	Clim_serv
	Addresses uncertainty and on-going change in climate	Clim_chng
	Collective interpretation of climate information is supported	Clim_stak
	Channels for communicating climate information are instated	Clim_com
4. Planning and decision-making processes	Supports planning and decision-making at the most appropriate level	Plan_lev
	Provisions are created to ensure that plans are flexible	Plan_bud
	The planning process identifies a range of adaptation options	Plan_opt
	Priority adaptation options are selected through a screening process	Plan_sel
5. Innovation, local and indigenous knowledge and technology	Introduces successful innovations and builds capacity for testing them	Tech_test
	Supports the use of local, traditional and indigenous knowledge	Tech_know
	Technology choices consider climate impacts, trade-offs, synergies	Tech_impt
	Link research and implementation initiatives	Tech_res
6. Adaptive Management	Resources are available for on-going adaptive management systems	Adap_res
	Initiatives ensure integration of disaster risk reduction	Adap_ddr
	The design avoids potential maladaptation	Adap_mal
	Established social and environmental safeguards (SES)	Adap_ses
7. Institutional linkages	Roles of institutional stakeholders are well-defined at different levels	Inst_role
	Inclusion of local and national civil society organizations	Inst_ngo
	Multi-stakeholder forums are established or strengthened	Inst_msf
	Linkages between stakeholder institutions are strengthened	Inst_gov
8. Learning, capacity building and knowledge management	Iterative learning, sharing, and capacity building are core activities	Mel_shar
	The monitoring system is continuous and effective	Mel_mon
	Supports feedback loops among targeted communities	Mel_fed
	Resources are allocated to sustain ongoing facilitation of learning	Mel_res
9. Scaling up and sustainability	Aims to establish local ownership and adaptive capacity	Sus_own
	Adaptation is integrated into development plans	Sus_int
	Engages with policy processes and governance structures	Sus_pol
	Cost-benefit analysis is used to ensure cost effective design	Sus_cba

Coastal adaptation projects were evaluated based on the degree to which each of the 37 criteria outlined in the Adaptation Good Practices Checklist were fulfilled. A three-point scale was used to assess the degree to which each criterion was fulfilled. Using this scale:

- A score of 0 indicates that the project either did not include any elements of the criteria, or failed to do so in an appropriate manner, as determined by the terminal or mid-term evaluation
- A score of 1 indicates that the project partially fulfilled the criteria by meeting some elements but not all, or did a marginally satisfactory job of doing so as determined by the terminal or mid-term evaluation
- A score of 2 indicates that the project included and performed well for the majority of elements of the criteria as determined by the terminal or mid-term evaluation.

This relatively simple subjective evaluation was designed to compare several large projects with different plans and objectives. Each project could receive a score of 0, 1, or 2 for each of the 37 criteria used, creating a potential range of total project scores of 0 to 74 (the actual range was 24 to 59).

2.5 CAVEATS

This evaluation was conducted based on desk review of reports available on-line. The review was subjective and requires several caveats.

1. Some of the criteria were quite broad and easier to fulfil because they included less technical requirements. For example, many projects had an element of building local capacity and establishing local ownership, and they were usually mentioned or discussed in the project evaluations. These criteria generally received scores of 1 or 2. In contrast, some of the more technical criteria, e.g., in the climate services category, did not lend themselves to a broad interpretation, and could easily receive a score of zero if, for example the project did not engage with any meteorological services. This analysis is thus somewhat limited in its ability to compare between criteria or practices.
2. The assessment is only based on terminal or mid-term evaluations conducted at the completion of the project or during the project. This does not allow to assess the effectiveness and sustainability of various practices implemented and their longer-term outcomes. It only captures whether given practice or activity was implemented as seen by the evaluating agency at the end of the project.

Therefore, this report only constitutes a first step assessment of whether the projects implemented the good practices recommended by the Adaptation Good Practices Checklist and not an evaluation of overall outcomes of the projects.

3.0 MAIN RESULTS

The sub-sections below present the scores aggregated by project or by practice. Detailed analysis by practice and criterion is presented in section 4.

3.1 OVERALL RANKINGS

The figure below shows the overall performance of projects as a sum of their performance in each criterion. The top three performing projects were:

1. Haiti - Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti
2. Sao Tome - Adaptation to Climate Change
3. Cuba - Reduction of Environmental Vulnerability

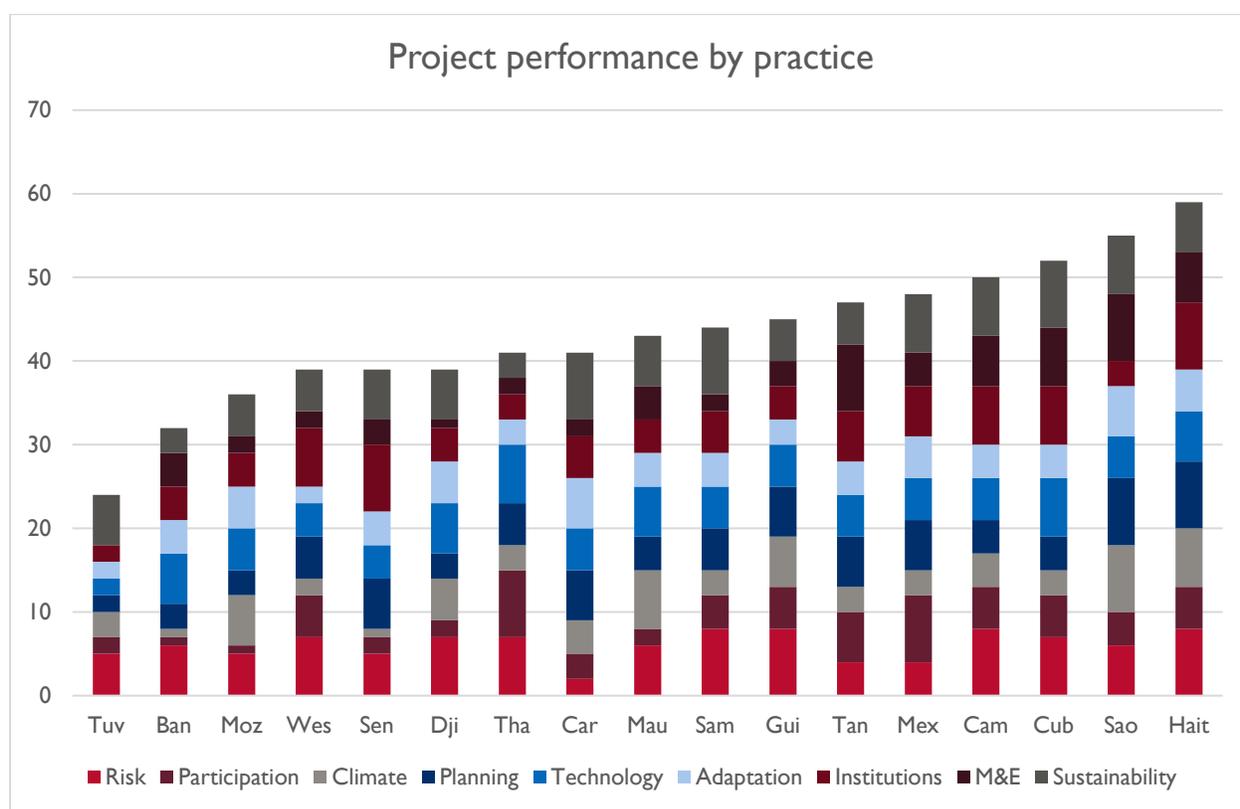


FIGURE 2: PROJECTS RANKED BY THEIR OVERALL PERFORMANCE IN ALL PRACTICES, RANKED FROM WORST TO BEST (SEE TABLE I FOR COUNTRY CODES)

It is noteworthy that projects perform very differently in each criterion. Table 3 presents best performers in each practice. As expected, the projects in Haiti and Sao Tome scored high in a larger number of practices (four each). Most of the projects, including the project in Cuba had top scores in two practices, except Djibuti, Mozambique, West Africa, Mauritius, Tuvalu and Bangladesh which never scored high in any of the practices, leading to the overall poor performance.

TABLE 3: TOP RANKING PROJECTS IN EACH PRACTICE

PROJECT	PRACTICE								
	1. Risk, vulnerability and capacity	2. Participation, inclusion and gender	3. Climate information and uncertainty	4. Planning and decision-making processes	5. Innovation, local & indigenous knowledge & technology	6. Adaptive Management	7. Institutional linkages	8. Learning, capacity building and knowledge management	9. Scaling up and sustainability
Moz									
Dji									
Sao			X	X		X		X	
Sen							X		
Gui	X								
Wes									
Tan								X	
Mau									
Cam	X								
Tuv									
Tha		X			X				
Ban									
Sam	X								X
Mex		X							
Car						X			X
Hai	X		X	X			X		
Cub					X				X

Note: see Table 1 for country codes

No relationship between the number or the type of activities implemented and overall performance were found: neither projects that implemented a more comprehensive set of activities, nor those that had a more limited focus, were more successful in following the best practice guidelines in their implementation.

3.2 REGIONAL ANALYSIS

In general, projects in Latin America and Caribbean, performed better than other regions, scoring more often as best performers (Table 3). This is further reflected in figure 3, which displays average scores by practice in each region. Projects in Latin America and the Caribbean had the highest average total score (50), followed by Africa (42.9) and Asia and the Pacific (38.2). The distribution by practice reveals that Asia and the Pacific had lowest averages by far in all but three practices, where they averaged highest (Risk) or close to second (Technology and Sustainability). Latin America & Caribbean had highest averages in all but two practices (Risk and Climate), meaning that the overall good performance of this region is not due to an exceptional performance in a few practices. Africa was usually in the middle, except for the Climate category, but underperformed in participation.

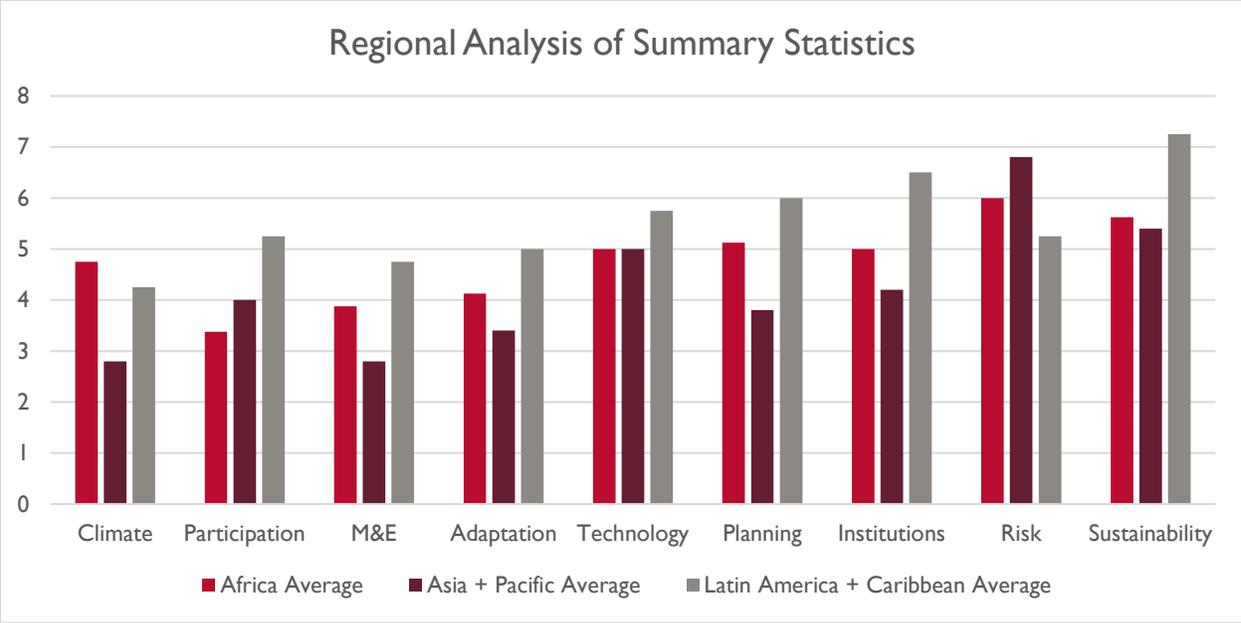


FIGURE 3: BREAKDOWN OF THE AVERAGE SCORE BY PRACTICE AND REGION.

3.3 BUDGET ANALYSIS

No significant relationship was found between the budget of the project and overall performance, as evidenced in Figure 4. However, there is a cluster of projects in the \$4M-\$6M range performing slightly better than the rest of the projects. Those projects, Cameroon, Cuba, Tanzania, Sao Tome, Guinea and Mexico, tended to focus on one country and had a strong system of M&E (not shown).

No clear relationships were discovered between projects budgets and their scores in each individual practice, with the exception of Institutional Linkages (Figure 5), where smaller projects tend to score lower than larger projects. Since larger projects tend to be multi-country or involve a larger number of partners and stakeholders, it is anticipated that they include more detailed assessment and stronger involvement of a larger number of stakeholders and institutions, as well as require larger funding for institutional coordination.

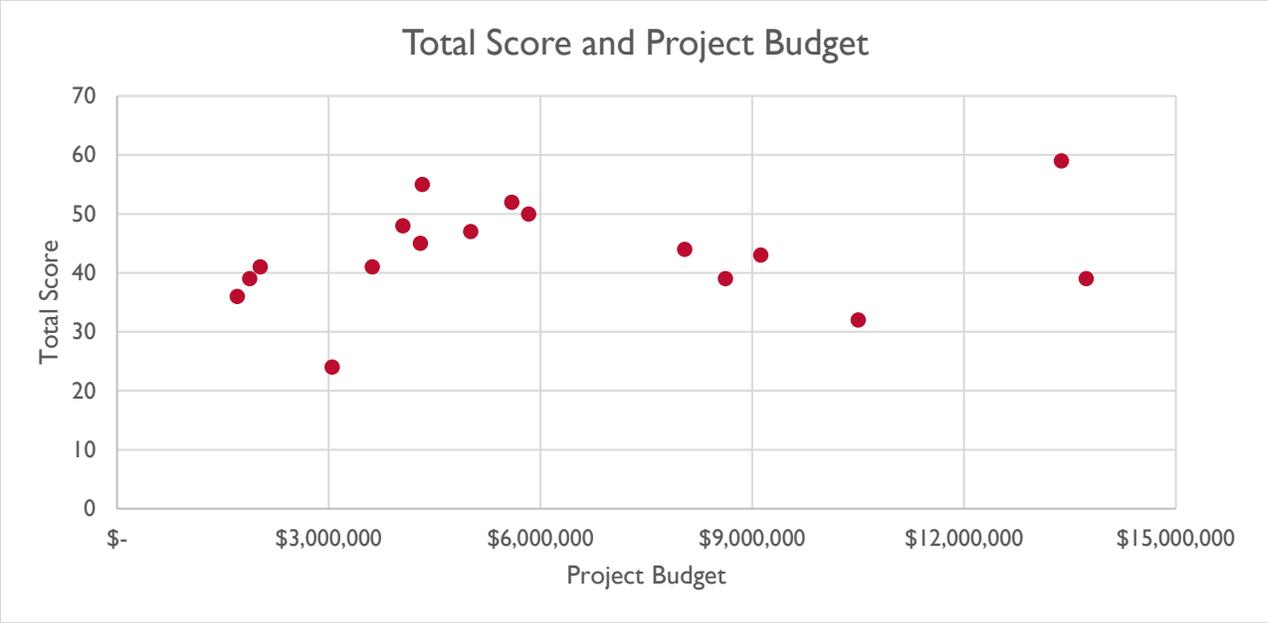


FIGURE 4: TOTAL PROJECT SCORES AS FUNCTION OF PROJECT’S BUDGET.

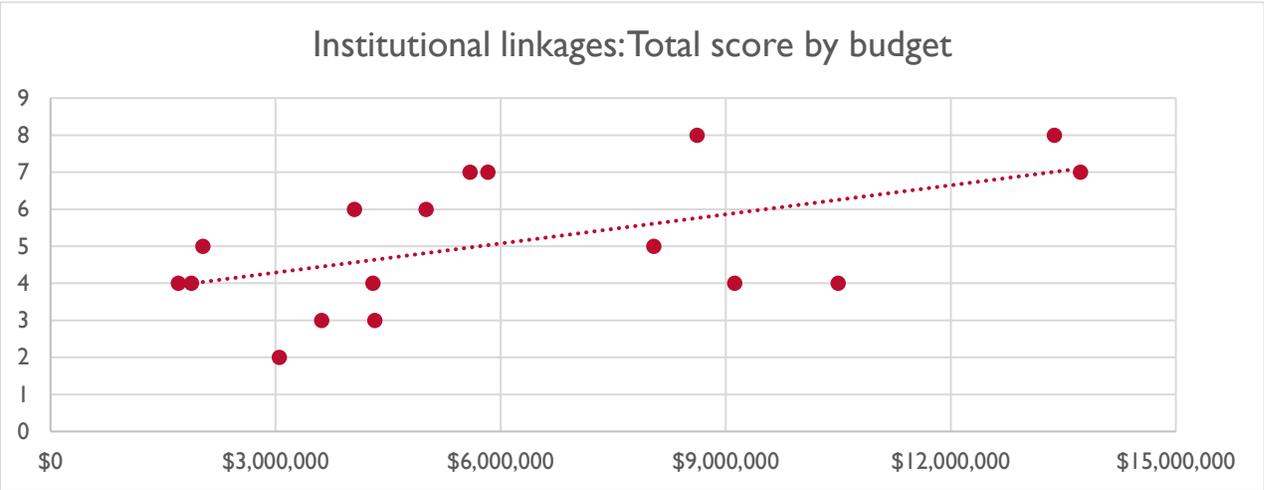


FIGURE 5: PROJECT SCORES ON INSTITUTIONAL LINKAGES AS FUNCTION OF PROJECT’S BUDGET.

3.4 ANALYSIS BY STATUS

With the caveat that mid-term evaluations represented less than 30% of all projects evaluated we also analyzed the differences in the performance by projects completed vs. on-going (Figure 6). With average total scores of 43 and 43.6, completed and midterm projects showed very little variation in their evaluation in each of the practices. This shows that projects generally stayed on their course from the beginning, and suggests that, on average, projects do not significantly improve after their mid-term evaluation. This implies that projects must be well-designed and structured from the beginning. The only significant difference between completed and mid-term projects is a stronger score in M&E that can be

due to overall stronger requirement for M&Es in newer projects but also could be due to the fact that two M&E criteria refer to on-going M&E and feedback loop activities that usually are not active after the completion of the projects.

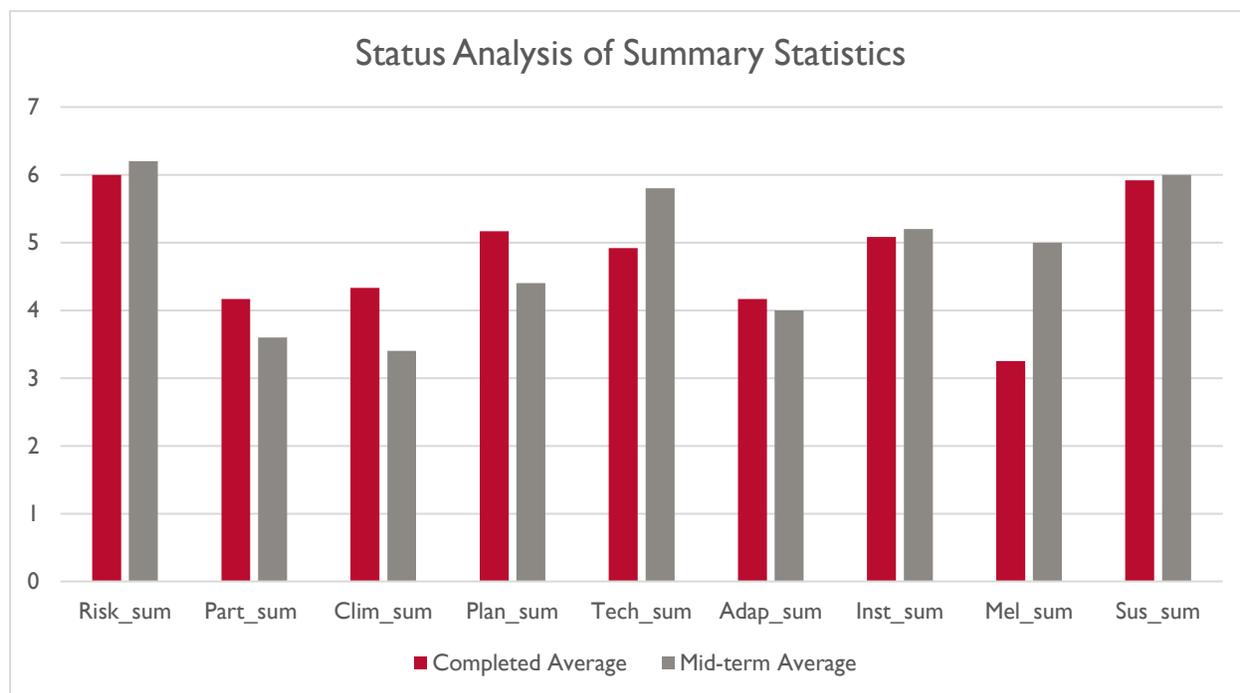


FIGURE 6: AVERAGE SCORE BY PRACTICE IN FINAL AND MID-TERM EVALUATIONS.

3.5 CRITERION FULFILLMENT

In addition to evaluating the performance of projects individually or by region, we analyzed the overall performance of coastal adaptation projects in our sample with respect to individual criteria. Figures 7 and 8 present the fulfillment aggregated by practice and for individual criterion. Practices and criteria are ranked by increasing order of the proportion of projects that scored 2, irrespective of the location, size or duration of the project. According to this analysis and bearing in mind the caveats mentioned in the methodology section, Climate and Participation practices have overall the lowest proportion of projects with highest scores and the highest proportion of projects scoring zero on the criteria related to the practice. Risk and Sustainability practices, on the other hand, have the highest proportion of highest scores and lowest proportion of the lowest scores.

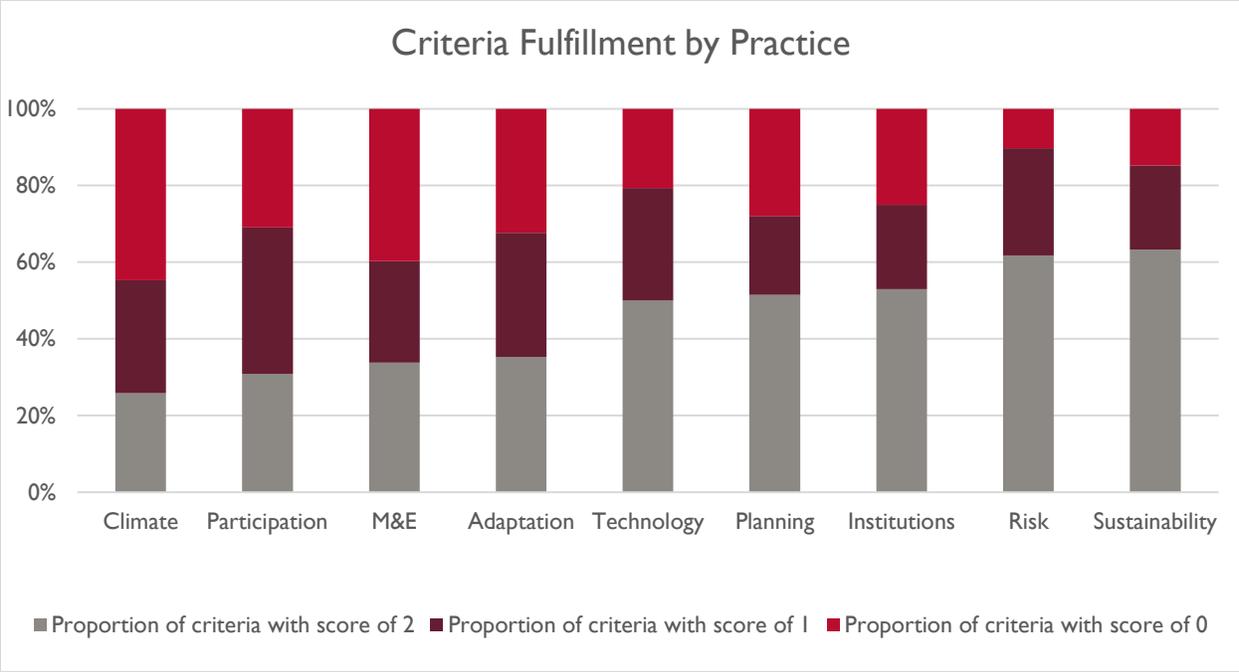


FIGURE 7: PROPORTION OF CRITERIA SCORING 0,1,2 RESPECTIVELY BY PRACTICE. PRACTICES ARE ARRANGED IN INCREASING ORDER OF THE HIGHEST SCORE

Figure 8 further illustrates the fulfillment by individual criterion and presents a more nuanced image. As expected from the aggregated view in Figure 7, Climate-related criteria show lowest proportion of projects scoring 2, with no projects scoring 2 in criteria reflecting collective interpretation of climate information (clim_stak) and assessment of information needs (clim_serv). Only four projects (less than 25% of the total) scored 2 in channels for communicating climate information (clim_com) and only 7 in the production of relevant climate information (clim_sys). The only climate related criterion that scored 2 by more than 50% of the projects, with no project scoring zero, deals with climate change, understood broadly. Criteria addressing the inclusion (e.g. diversity of groups, gender, part_risk, part_gen and part_div) were also not well taken into account, scoring 2 in fewer than 25% of the projects.

In addition, several criteria related to planning - the use of a screening process (Plan_sel) or flexible planning (Plan_bud); to M&Es – feedback loops and sustained learning (Mel_fed Mel_res); to sustainability – CBA (Sus_CBA), show contrasted results with less than 50% of the projects scoring 1 or 2 and more than 50% scoring 0.

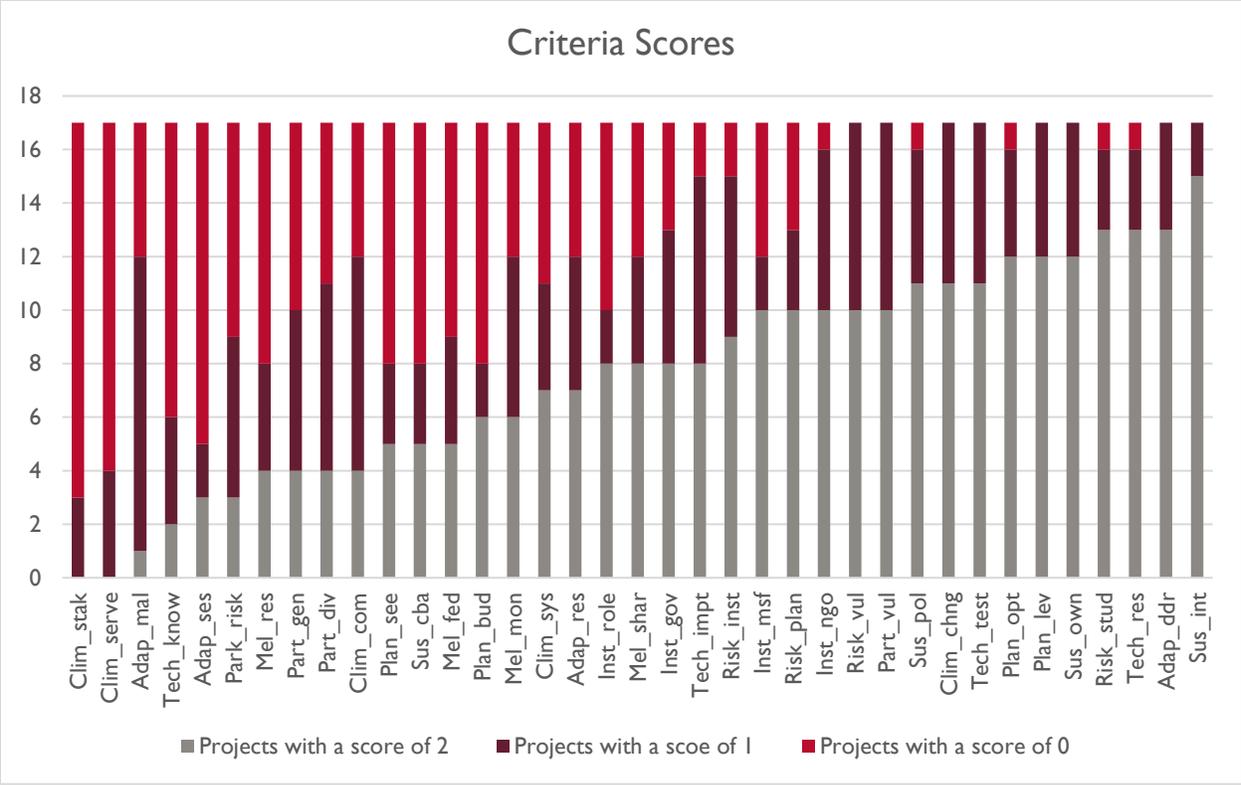


FIGURE 8: NUMBER OF PROJECTS SCORING 2, 1 AND 0 RESPECTIVELY ON EACH INDIVIDUAL CRITERION.

Sustainability-related criteria score highest in largest number of projects with the exception of the cost-benefit analysis (sus_cba), not conducted in more than 50% of the projects. Similarly, most of the projects score high on innovation and technology criteria, with the exception of the use of local and indigenous knowledge (tech_know). Approximately one third of the criteria receive a score of 1 or 2 in at least 16 projects.

A more detailed discussion of how projects performed with respect to each practice is highlighted in their corresponding sections to follow.

4.0 DETAILED ANALYSIS BY PRACTICE

The following sub-sections detail the performance of all projects in each of the nine best practices and provides more detailed description of the criteria.

4.1 RISK, VULNERABILITY, AND CAPACITY

Goal: Analyze climate risks, differential vulnerability and capacity of people, ecosystems, and institutions.

4.1.1 CRITERIA FOR EVALUATION

- a) **Risk_vul:** Climate *vulnerable* people are targeted and defined by livelihood assets and strategies, social groups, ecological and climatic zones, land use and environmental management, gender, wealth differences.
- b) **Risk_stud:** Assessments and risk surveillance systems include the *study* of climate risk; social, economic and ecosystem vulnerability; people’s knowledge and capacity; underlying causes of vulnerability; existing systems to manage risk at different timescales.
- c) **Risk_inst:** *Institutional* mapping identifies the range of community, local and national organizations involved in management of climate change risks and impacts; analyses organisational capacity and linkages.
- d) **Risk_plan:** Analysis results inform the next steps of participatory *planning* and choice of adaptation strategies.

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
Risk_vul	0	7	10
Risk_stud	1	3	13
Risk_inst	2	6	9
Risk_plan	4	3	10

Most projects were able to partially or entirely fulfill the basic requirements within the criteria within this practice, with nearly every project including some sort of assessment involving climate risk, vulnerability, and capacity. Some projects struggled to use this analysis to inform the next stage of participatory planning, and the results of the analysis were not included in the final project design. Several organizations only partially assessed vulnerability, usually looking only at ecological and economic determinants of vulnerability without necessarily considering the specific vulnerabilities of women and other marginalized social groups, which accounts of the large number of projects that only partially fulfilled the risk_vul criteria.

The mapping of institutions varied greatly among projects, with certain projects listing ministries within the government that had a role to play and others diving deep into stakeholder analysis that demonstrated a comprehensive knowledge of the influence and importance of all relevant institutions.

4.1.2 RANKINGS

The fulfillment of the risk, vulnerability, and capacity criteria required projects to carry connected comprehensive assessments that targeted the social, ecological, and economic factors underpinning vulnerability. The following four projects obtained a perfect score on this assessment:

- Vulnerability Assessment and Adaptation Project for Climate Change in the Coastal Zone of Cambodia
- Increased Resilience and Adaptation to Adverse Impacts of Climate Change in Guinea's Vulnerable Coastal Zones
- Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti
- Enhancing resilience of coastal communities of Samoa to climate change

While this practice was well implemented by the majority of projects, one project in particular seemed to experience difficulties with this practice. “Implementation of Pilot Adaptation Measures in coastal areas of Dominica, St. Lucia and St. Vincent & the Grenadines” did not have an explicit analysis of poverty and gendered impacts, meaning that no social components were analyzed in support of this project. Furthermore, the project did not carry out a sufficient initial institutional analysis which resulted in several key problems within the project design. The experience of this project in the Caribbean highlights the importance of fulfilling this practice before beginning project design.

4.1.3 REGIONAL ANALYSIS



Scores in the Asia + Pacific region seemed to be slightly higher due to the influence of the projects in Cambodia and Samoa, while the Latin America and Caribbean average were brought down by the multi-country project in the Caribbean noted above.

4.2 PARTICIPATION, INCLUSION, GENDER EQUALITY

Goal: Ensure participation, voice and inclusion of all groups.

4.2.1 CRITERIA FOR EVALUATION

- a) **Part_risk:** Risk analysis involves a diverse range of social groups of people and includes: analysis of gender, power dynamics and relations among men, women, and youth of different social standing and vulnerability, wealth, and ethnicity.
- b) **Part_vul:** Mechanisms are incorporated for *vulnerable* groups to continually and actively engage in adaptation decision-making at the most appropriate levels: all groups and actors are supported to organize together, participate, identify their livelihood or sector aspirations, needs and priorities and assess them against the context and future climate scenarios.
- c) **Part_gen:** Gender equality is an explicit goal, addressing underlying causes and ensuring gender equitable access, control and accumulation of assets, information, adaptation benefits and adaptive capacity strengthening.
- d) **Part_div:** The rights and agency of the full range of actors, as well as gender and *diversity* representation are strengthened across sectors, levels, and activities so as to achieve local ownership over decision-making processes and implementation and fully transparent communication.

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
Part_risk	8	6	3
Part_vul	0	7	10
Part_gen	7	6	4
Part_div	6	7	4

The participation, inclusion, and gender equality practice had the largest share of partially fulfilled criteria. For example, the projects often involved some mention of gender or youth but didn't necessarily take a broad approach that explicitly included different social groups or addressed existing power dynamics. Projects often had participation strategies that prioritized consultation over active engagement throughout the entire process. Many projects only mentioned gender once or twice, without any meaningful effort to sustainably mainstream gender and diversity concerns. Finally, project efforts to improve the rights and agency across the full range of actors were insufficient, often simply strengthening existing power structures. Over half of the projects had total scores of 4 or below (out of 8), which suggests that there needs to be an improvement in the effective consideration of participation, inclusion, and gender equality practices.

4.2.2 RANKINGS

The top performers of the participation, inclusion, and gender equality practice were:

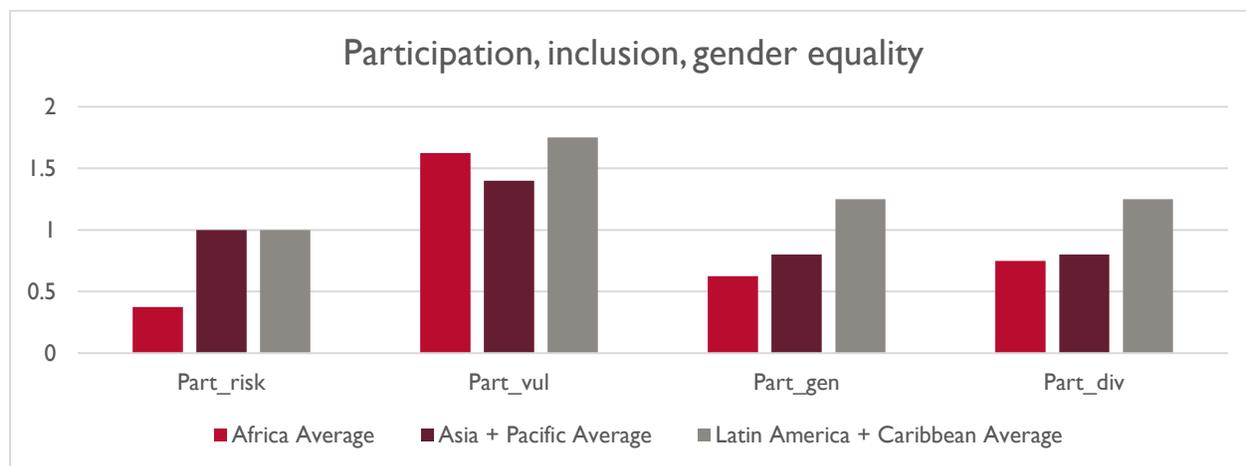
- Adaptation to Climate Change Impacts on the Coastal Wetlands in the Gulf of Mexico

- Strengthening the Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events (Thailand)

In the Mexico project’s terminal evaluation, it was noted that the implementation team “devoted significant time and efforts to envisage and implement a highly participatory strategy that also aimed at empowering local women,” which resulted in a “strong gender focus in project implementation, having local women actively contributing to project activities and reflecting that men and women are equal participants, leading to changes in the social fabric.” The Thailand project additionally had a strong gender component and policies that were generally considered to be pro-poor, with a participation strategy that targets women and youth. Interestingly, both of these projects faced challenges with institutional coordination which impacted the projects’ overall success, suggesting that there needs to be a balance between “bottom-up” and “top-down” strategies.

The project “Community Based Adaptation to Climate Change through Coastal Afforestation in Bangladesh,” faced particular challenges due to an insufficient implementation of inclusion and participation, including an improper selection of beneficiaries without considering household wealth variations, creating conflicts with local politics that caused setbacks for the entire project.

4.2.3 REGIONAL ANALYSIS



Overall, projects in Africa have the weakest scores in participation, inclusion, and gender equality practices, with 4 out of the 6 projects scoring a 2 or lower (out of a maximum 8). Gender was often not explicitly addressed, and many projects were accused of simply recreating existing power dynamics. All projects performed well on the part_vul criterion but did not included part_gen or part_div.

4.3 CLIMATE INFORMATION, UNCERTAINTY

Goal: Corporate management of uncertainty and use of climate information.

4.3.1 CRITERIA FOR EVALUATION

- a) Clim_sys: The initiative engages with systems in which meteorological services and other sources produce accessible and relevant climate information at appropriate spatial and temporal scales to continuously inform actions at different levels.

- b) *Clim_serv*: Climate information services are supported to respond to local knowledge and expressed information needs of actors (community members, service providers and project stakeholders) across relevant spatial and time scales and roles.
- c) *Clim_chng*: The initiative addresses uncertainty and on-going *change* in climate as important factors to understand, communicate and work with, in all steps of adaptation.
- d) *Clim_stak*: Regular local level *multi-stakeholder* dialogue and collective interpretation of climate information advisories for action is supported to continuously inform adaptation decision-making and actions.
- e) *Clim_com*: The initiative supports channels of *communication* for climate information and advisories which ensure all social groups have sustainable access, confidence in and capacity to act, learn and give feedback.

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
<i>Clim_sys</i>	6	4	7
<i>Clim_serv</i>	13	4	0
<i>Clim_chng</i>	0	6	11
<i>Clim_stak</i>	14	3	0
<i>Clim_com</i>	5	8	4

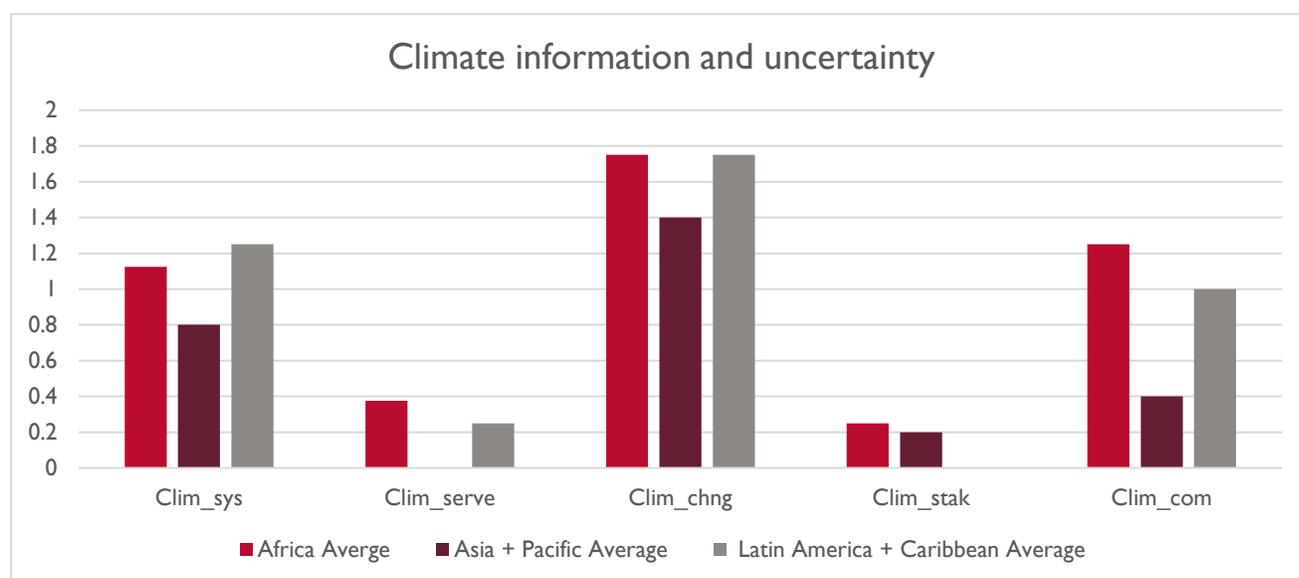
While most projects recognized that climate change is ongoing and addressed uncertainties to some degree, a large number of project did not include a climate services component at all. Of the projects that did, there was very little mention of why these services were put in place and whose needs they were responding to. Furthermore, it wasn't always clear who was using the climate information produced and how it would be interpreted on a long term basis. None included any indication of how this information would be used to inform a multi-stakeholder process of interpretation and policy formulation. Some projects included the strengthening of a national meteorological service. The climate information and uncertainty practice was overall the least fulfilled of all practices considered in this survey. The provision of climate services that are contextually appropriate with sustainable interpretation mechanisms is essential for coastal adaptation projects, and the lack thereof presents a large gap in coastal adaptation projects to date.

4.3.2 RANKINGS

The best model for the incorporation of climate information and uncertainty into project design is “Sao Tome - Adaptation to Climate Change.” In this project, new meteorological equipment was purchased and robust training was provided to the national meteorological service. In addition, daily reports were created by the meteorological service, and a mechanism was put in place whereby these daily reports were sent via radio to local risk committees and beach supervisors. The project could have improved by engaging with existing local systems to interpret weather information, which was deemed problematic and dangerous, and finding ways to express and communicate climate information in a way that was accessible to all members of society.

The project “Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti” also had a strong climate information and uncertainty component, with the installation of meteorological equipment and the training of workers. It worked to create different types of knowledge and communication platforms that could be interpreted by a wide range of stakeholders. However, there was no obvious connection as to how that information being produced and disseminated on a short-term time scale was used to inform actions at a local level.

4.3.3 REGIONAL ANALYSIS



Projects in Asia and the Pacific were the least successful in implementing climate information and uncertainty practices, and many did not include a climate services component at all. In Africa, some projects had relatively high scores while others had very low scores, which is not captured in the average score. Overall, none of the regions had an average total score above 5 out of a maximum of 10.

4.4 PLANNING AND DECISION-MAKING PROCESSES

Goal: Promote anticipatory and flexible adaptation planning and decision-making processes with and by the people affected.

4.4.1 CRITERIA FOR EVALUATION

- a) **Plan_lev:** The initiative supports planning and decision-making at the most appropriate *level* (community, local, sector, national and relevant governance structures), to ensure context-specific, locally determined plans with the participation of those who will be affected, will benefit and will provide on-going services and support.
- b) **Plan_bud:** Provisions and *budgets* are created to ensure that plans and actions are flexible and reviewed regularly, and enable systematic processes for anticipation of and response to changing conditions, needs and uncertainty of climate impacts.

- c) **Plan_opt:** The planning process is informed by multiple sources and identifies a range of adaptation *options*: trends analysis, past information, current conditions, people’s aspirations, and anticipation of future climate impact scenarios.
- d) **Plan_sel:** Priority adaptation options are *selected* through a screening process to assess social, economic and environmental feasibility, gender equality, underlying causes of vulnerability, resilience to expected climate impacts and risks and synergies with existing systems and plans.

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
Plan_lev	0	5	12
Plan_bud	9	2	6
Plan_opt	1	4	12
Plan_sel	9	3	5

Overall incorporation of planning and decision-making processes varied widely across projects. Most of the projects fulfilled the criteria for “plan_lev” and “plan_opt”, indication that projects were generally good at working across multiple levels and information choices through a detailed research process.

Projects were not particularly good as a whole for creating budgets that were flexible and responsive to change. Further research is needed to indicate whether or not these budgets are generally inflexible as a result of design or as a result of donor expectations. In general, many projects struggled to adjust to budgetary shocks such as unexpected logistics costs, very much causing disturbances in the project as a whole.

Project scores for the fulfillment of “plan_sel” are relatively reflective of the degree to which a project included participation, inclusion, and gender equality practices.

4.4.2 RANKINGS

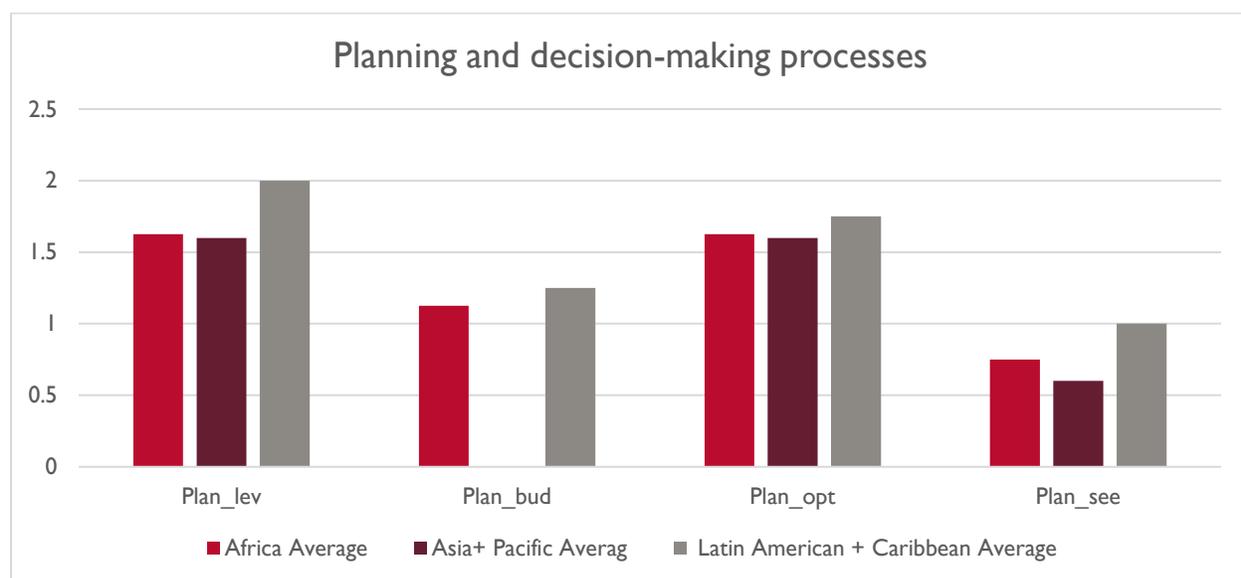
The projects that had perfect scores for planning and decision-making processes were:

- Sao Tome - Adaptation to Climate Change; and
- Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti

In Sao Tome, the creation of risk maps through participatory methods supported the presentation of various adaptation options to communities themselves, who then suggested even more options. These local decision-making processes were complemented with institutional strengthening at the national level, and this process was designed from the beginning to be a part of the national adaptation plan. It was flexible by design with a second phase already being considered. In Haiti, the project adequately balanced the needs of local communities and institutional stakeholders. The flexibility of the project design was illustrated in how the project responded to hurricane Matthew.

Projects that achieved lowest scores often had highly inflexible plans and budgets which forced them into sub-optimal options that, in some cases, revealed not feasible. It was often unclear exactly how certain options were selected, or if there was any screening process to choose the optimal options.

4.4.3 REGIONAL ANALYSIS



Projects in Asia and the Pacific had the lowest overall scores, followed by Africa and then Latin American + Caribbean. This is consistent with the overall rankings by region, highlighting that planning processes are an important component of overall quality of the project.

4.5 INNOVATION, LOCAL KNOWLEDGE, TECHNOLOGY

Goal: Promote innovation, local knowledge and technology

4.5.1 CRITERIA FOR EVALUATION

- a) **Tech_test:** The initiative introduces successful innovations and strengthens capacity for continuous innovation and *testing* of: adaptation approaches, inclusive social systems, strategies and appropriate technologies by communities and all other stakeholders, to enable flexible, adaptive, and relevant responses to current and future climate risks and impacts
- b) **Tech_know:** The initiative supports the use of local, traditional and indigenous *knowledge*, as appropriate through i) access and validation, ii) combination with other knowledge sources for participatory technology development, iii) building capacity, local confidence, and trust and ix) contextualizing and informing innovation and technology for adaptation actions
- c) **Tech_imp:** Technology choices consider climate *impacts*, trade-offs, synergies between vulnerable groups and ecosystems and equitable benefit sharing, responding to risk, vulnerability and capacity at community and landscape levels
- d) **Tech_res:** Link *research* and implementation initiatives for development of longer term solutions informed by climate science, trends and local conditions and aspirations, providing for continuous updating of available technologies

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
Tech_test	0	6	11
Tech_know	11	4	2
Tech_impt	2	7	8
Tech_res	1	3	13

In the innovation, local knowledge, and technology practice, projects performed generally well. Most projects introduced some sort of successful innovations and strengthened capacity for continuous testing of technologies. Some consideration of climate and ecological impacts of each technology used was usually included, although the degree to which projects took it a step further and considered the human impacts varied considerably across projects. Almost every project had some sort of linkage to research institutions.

Projects were not particularly good at using local or indigenous knowledge, despite the fact that communities living along the coast often have coping strategies in place to deal with to climate variability and coastal erosion that allowed them to thrive in the past. This criterion thus presents an enormous gap and need to be better included in future coastal adaptation projects.

4.5.2 RANKINGS

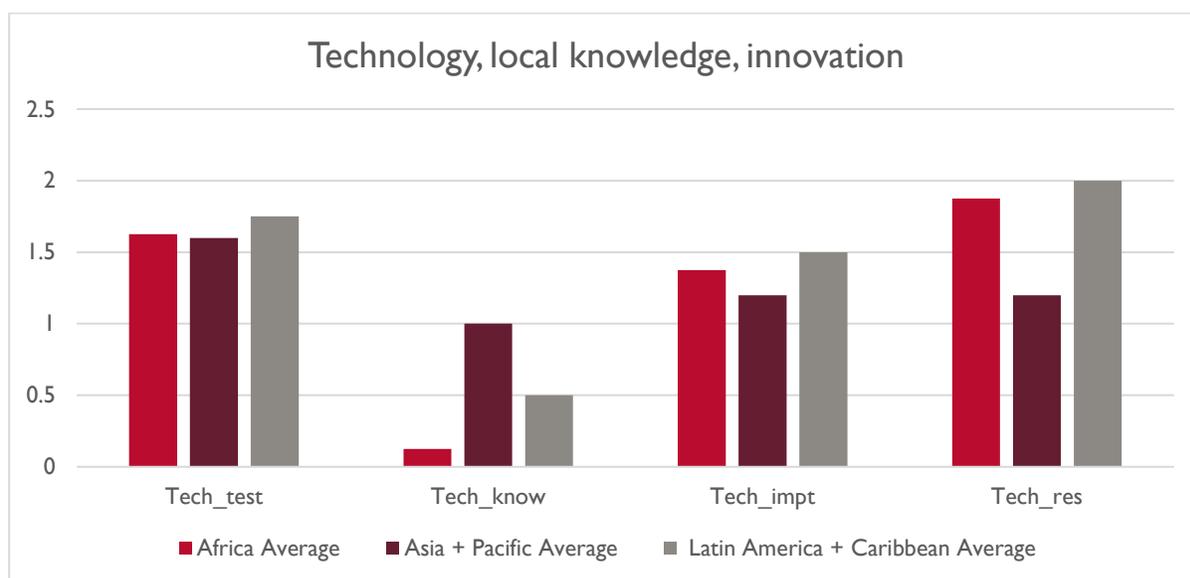
The two best performers for the Innovation, Local knowledge, and Technology practice were:

- Strengthening the Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events (Thailand)
- Reduction of Environmental Vulnerability (Cuba)

In Thailand, the terminal evaluation noted the “The Project has successfully highlighted local capacity in implementing traditional knowledge in climate change adaptation. An example was observed at Libong Island in the Trang province, where villagers have been experimenting with expanding mangrove forests and collecting information to assess ecosystem responses.” The project focused specifically on innovations that have a good chance of replication, building the capacity for communities to use these in the long term. It additionally looked specifically at how the technology could be used to promote equitable benefit sharing.

In Cuba, the project had a strong partnership with local universities, which provided a concrete link between research and implementation for the long term. This allowed for the technology used in the project to be maintained for the long term.

4.5.3 REGIONAL ANALYSIS



Projects in Latin America and the Caribbean performed slightly better on average than projects in Africa and Asia and the Pacific, most likely through the influence of projects in Cuba and Haiti.

4.6 ADAPTIVE MANAGEMENT

Goal: Ensure an integrated and holistic response with adaptive management of climate-related risks and impacts over time.

4.6.1 CRITERIA FOR EVALUATION

- a) **Adap_res:** Resources are available for on-going adaptive management systems and activities in addition to implementation of adaptation technologies: for adaptive capacity strengthening, climate information services, extension, policy, and finance support, appropriate monitoring and evaluation and learning systems
- b) **Adap_drr:** Initiatives ensure integration of *disaster risk reduction*, economic investment and livelihood improvement options and plans: early warning action systems, contingency plans, safety net or risk insurance enhance the resilience of sector-based development
- c) **Adap_mal:** The design avoids potential *maladaptation* across the range of actors and sectors involved. It considers concerns, opportunities and synergies or trade-offs between: ecosystems and environmental management; peoples, sector and institutions aspirations for sustainable socio-economic development, and climate risk and vulnerability
- d) **Adap_ses:** Established *social and environmental safeguards* (SES) are known and respected in design, implementation and monitoring.

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
Adap_res	5	5	7
Adap_drr	0	4	13
Adap_mal	5	11	1
Adap_ses	12	2	3

All projects surveyed included some element of disaster risk reduction and livelihood improvement options, and some projects had highly sophisticated DRR plans that involved local risk committees and robust early warning systems.

Projects varied in their commitment to providing resources for ongoing adaptive management and their consideration of maladaptation. Some projects laid out specifically maladaptive practices and others did not fully consider all possible risks, and as such it was quite rare to find a project that entirely avoided all possible maladaptation.

Most of the projects did not have established social and environmental safeguards.

4.6.2 RANKINGS

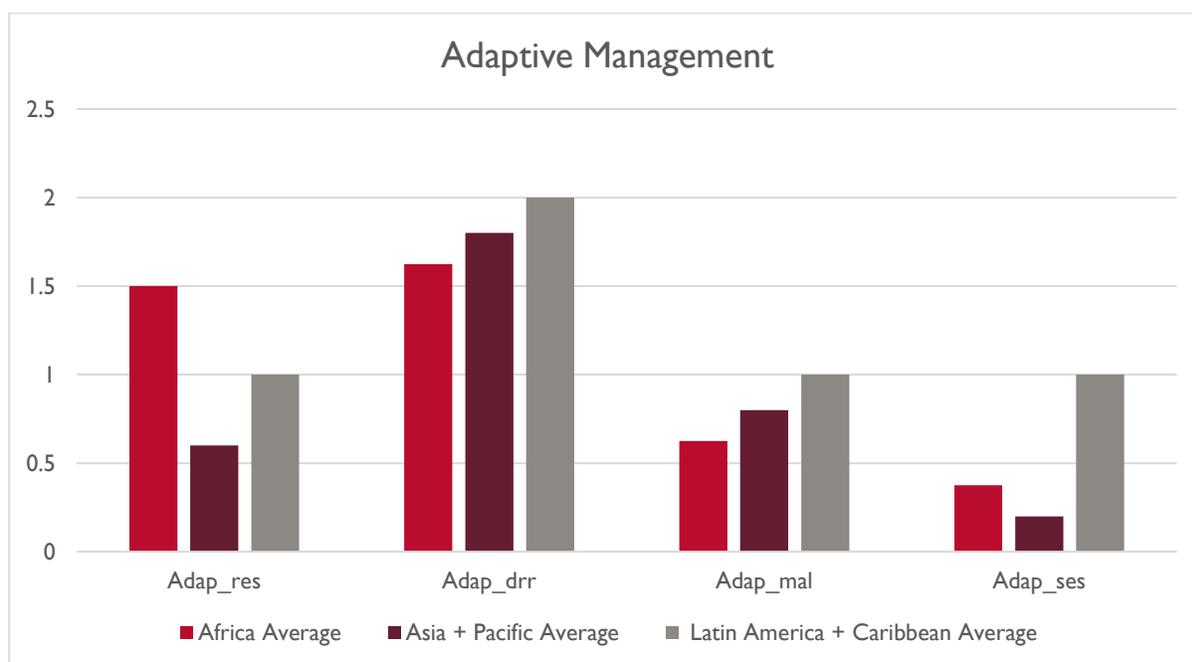
The two projects that performed the highest in this category were:

- Implementation of Pilot Adaptation Measures in coastal areas of Dominica, St. Lucia and St. Vincent & the Grenadines
- Sao Tome - Adaptation to Climate Change

However, both of these projects only scored a 6 out of 8, meaning that both projects were still missing key elements of adaptive management.

In the Caribbean the project had relatively robust social and environmental safeguards that were respected in design and implementation and helped the project take measures that avoided maladaptation. For example, in setting up wind turbines, the project ensured that local populations would not be affected by the sale of land. In Sao Tome, the terminal evaluation noted that the “project’s design was simple, with clear objectives and straightforward sequencing of tasks. It did not predetermine all the activities during preparation but rather allowed for flexibility to adapt to the needs of the local communities, the assessment of capacities, and the findings of technical studies.”

4.6.3 REGIONAL ANALYSIS



Overall, average total scores in the adaptive management category were reflective of the average regional scores across all criteria, suggesting that adaptive management is an important part of the overall project performance.

4.7 INSTITUTIONAL LINKAGES

Goal: Establish institutional arrangements and linkages which facilitate multi-stakeholder engagement.

4.7.1 CRITERIA FOR EVALUATION

- a) **Inst_role:** The contribution, *roles* and responsibilities of all institutional stakeholders in supporting adaptation are well-defined at different levels, including for coordination and coherent action.
- b) **Inst_ngo:** Inclusion of local and national civil society organizations in adaptation decision-making, planning and implementation is promoted, including community-based organizations and NGOs.
- c) **Inst_msf:** *Multi-stakeholder forums* are established, broadened, or strengthened to enable coordinated cross-sector and intra-sector planning and collective decision-making at different levels to address climate risks and uncertainties
- d) **Inst_gov:** *Governance* systems and linkages between stakeholder institutions and sectors are strengthened or established, to ensure institutional arrangements and coordination mechanisms for equitable, sustainable, and accountable adaptation planning processes and actions at local to national levels

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
Inst_role	7	2	8
Inst_ngo	1	6	10
Inst_msf	5	2	10
Inst_gov	4	5	8

Projects varied significantly in how they created institutional linkages, with total scores ranging between 8 and 2 out of 8. Despite this, many projects performed very well, with 5 projects scoring a 7 or higher.

However, many projects experienced difficulties in defining the roles and responsibilities of all institutional stakeholders, and this often impacted project’s success. Many evaluations detailed the difficulties that certain projects faced with coordinating with multiple ministries across multiple levels, impacting program sustainability.

Projects were generally good at coordinating with local or national civil society organizations, including local women’s networks and NGOs.

4.7.2 RANKINGS

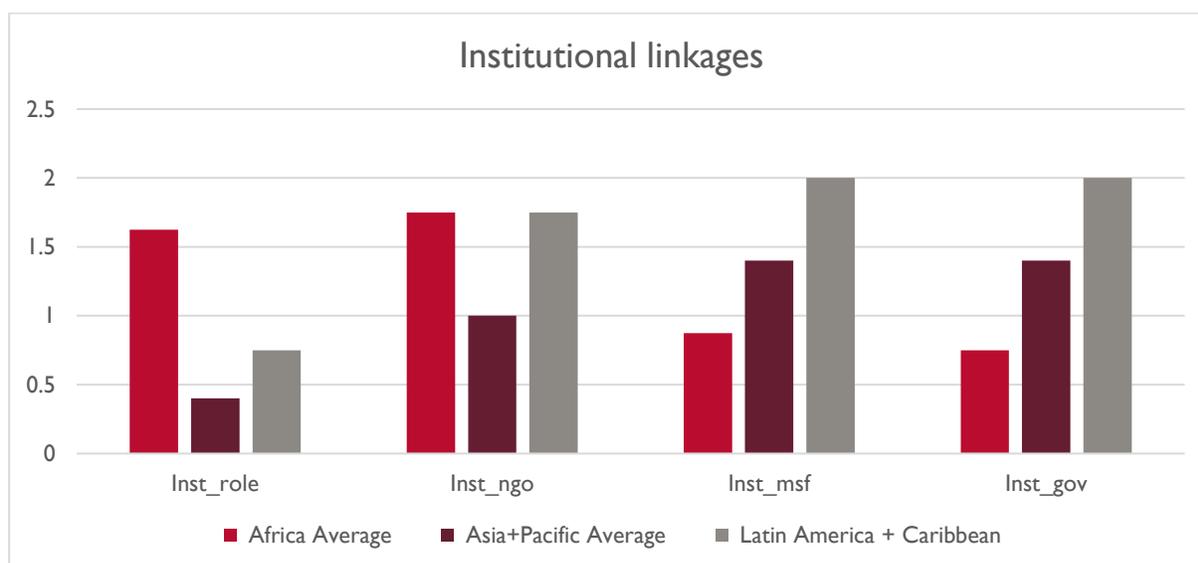
The projects that performed the best in the Institutional linkages practice were:

- Adaptation to coastal erosion in vulnerable areas (Senegal)
- Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti

In Senegal, the project created a multi-stakeholder steering committee called the “Comité National sur les Changements Climatiques” (COMNACC), where all stakeholders and beneficiary groups were represented. This allowed for a strong collaboration between local NGOs and government representatives, which reduced overall vulnerability. Importantly, the Senegal project was one of the only organizations that worked almost entirely through local NGOs, suggesting that this model should be further explored if the goal is to improve institutional linkages. In Haiti, general governance capacity increased because the project triggered an inter-ministry cooperation on the multi-sectoral aspects of climate change. This not only improved the country’s ability to deal with climate related shocks in the future, but to deal with other types of shocks as well.

The project “Strengthening the Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events in Thailand” provides a good example of the consequences that can result when the “top-down” approach is neglected. Institutional stakeholders were very much insufficiently engaged in the project, and many other key stakeholders only acted as observers

4.7.3 REGIONAL ANALYSIS



Projects in Latin America and the Caribbean performed quite well in this practice, and the overall regional score was brought up by projects in Haiti, Cuba, and Mexico.

4.8 PRACTICE 8: LEARNING, CAPACITY BUILDING, KNOWLEDGE MANAGEMENT

Goal: Integrate learning, capacity building, monitoring and knowledge management processes.

4.8.1 CRITERIA FOR EVALUATION

- a) **Mel_shar:** Iterative learning, *sharing*, capacity building for all stakeholders are core activities, supporting co-generation of new knowledge and solutions, access to information by a range of sources: local, national, south-south and globally
- b) **Mel_mon:** The *monitoring* system assesses and reports on change in: adaptive capacity, anticipated or avoided risk, systems and services, and resilience impacts as part of the standard and agreed indicators for the initiative to enable improvements based on adaptation learning and evidence
- c) **Mel_fed:** The initiative supports continuous reflection, learning and *feedback* loops among targeted communities, local service providers and other actors, to inform their planning and modification of activities and identification of capacity gaps, policy issues and demands as the climate and other circumstances change
- d) **Mel_res:** *Resources* are allocated to sustain ongoing facilitation of learning, knowledge management and brokering to enable exchange of and access to evidence and knowledge by stakeholders adaptation programmes, NIEs and other actors

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
Mel_shar	5	4	8
Mel_mon	5	6	6
Mel_fed	8	4	5
Mel_res	9	4	4

After climate information and uncertainty, the learning, capacity building, and knowledge management practice was the least well implemented of all the practices. This being said, most projects did have a goal of building capacity among local communities so that the projects could be sustainable in the long term.

While most projects did try to build capacity for all stakeholders, it was clear than many projects didn't set up an adequate system for learning and iterative testing. Furthermore, many projects consulted with communities during the project design, but did not create a feedback loop that monitored the perspectives of local communities and adapted the project accordingly. Many projects didn't set aside resources for the ongoing facilitation of learning and sharing of information, which is definitely a lost opportunity for future projects.

4.8.2 RANKINGS

The projects that performed the best in the learning, capacity building, and knowledge management were:

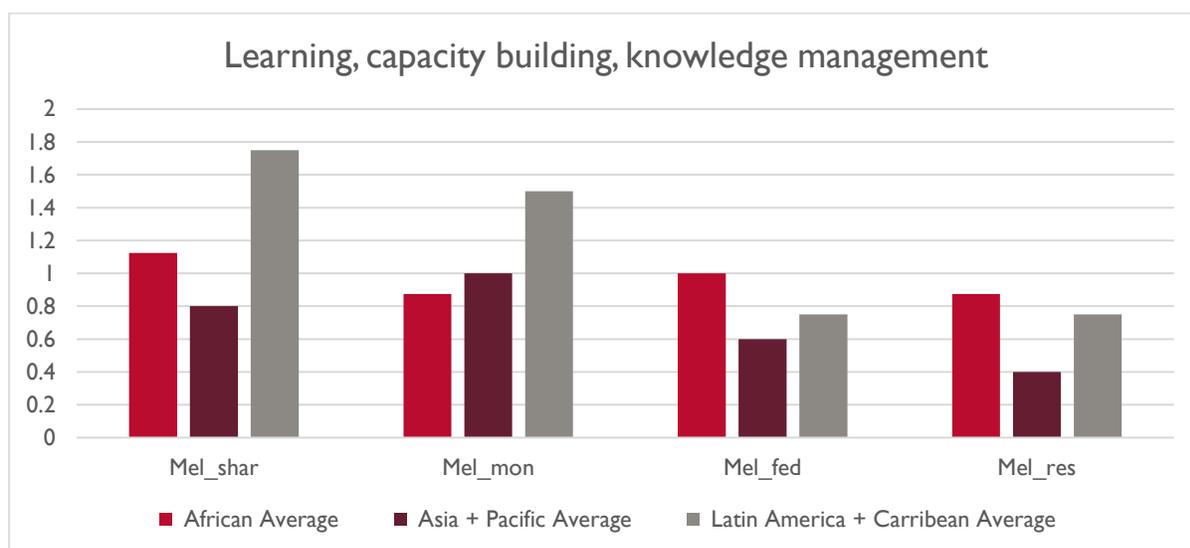
- Sao Tome - Adaptation to Climate Change
- Implementation of concrete adaptation measures to reduce vulnerability of livelihoods and economy of coastal communities of Tanzania

The project in Sao Tome benefited from lessons learned in other projects in Mozambique, Comoros, and Madagascar in its preparation phase and during implementation. The community based M&E structure adequately reported project achievements and largely informed decision-making. The project had intermediate outcome indicators to track project implementation that were systematically discussed with the project team.

The project in Tanzania used lessons learned from other regional projects and created a system that adapted well to change. As it is a mid-term project, the evaluation noted that to date, the project had sufficiently followed all monitoring plans and had a robust plan for continuing M&E activities in the future.

Projects that struggled to fulfill this category seemed to only use monitoring for reporting, as was the case in the project "Implementing NAPA priority interventions to build resilience in the most vulnerable coastal zones in Djibouti". In this project, the evaluation noted that "The reporting focused significantly on the 'percent completed' for each activity / output. Partners were sometimes subjected to strong pressure to quickly complete their 'activity'." This obviously is not good practice for adopting a framework that promotes learning across the project and for other projects.

4.8.3 REGIONAL ANALYSIS



The regional averages for this practice were consistent with the overall regional averages.

4.9 SCALING UP AND SUSTAINABILITY

Goal: Support to ongoing sustainable adaptation at scale

4.9.1 CRITERIA FOR EVALUATION

- Sus_own:** The initiative aims to establish local *ownership*, adaptive capacity and resources so that the resulting socio-cultural, economic and environmental adaptation benefits and supporting systems and services are sustainable and replicable
- Sus_int:** Adaptation is *integrated* into mainstream sectors, programmes and local/ national development plans in response to climate risk and uncertainty, to ensure all development is climate resilient
- Sus_pol:** The initiative engages with *policy* processes, governance structures and services, public, private, and civil society institutions and the enabling environment to ensure the resulting adaptation processes and outcomes are sustainable, up-scales, and promoted nationwide
- Sus_cba:** Socio-economic and environmental *cost-benefit analysis* of adaptation actions, including of on-going planning, climate service provision, direct and indirect impacts, and adaptive management, is documented and used to ensure cost effective design and outcomes

	Number of projects with criteria not fulfilled (score of 0)	Number of projects with criteria partially fulfilled (score of 1)	Number of projects with criteria fulfilled (score of 2)
Sus_own	0	5	12
Sus_int	0	2	15
Sus_pol	1	5	11
Sus_cba	9	3	5

Overall, projects performed relatively well in the scaling up and sustainability practice. All projects at least partially fulfilled the sus_own and sus_int criteria, meaning that they worked to establish local ownership and mainstream adaptation into national development plans. As many of the projects surveyed were large projects facilitated by organizations such as UNDP, many of the projects were in perfect alignment with the countries national adaptation plans of action (NAPAs). Furthermore, most projects engaged with policy processes in order to create sustainable outcomes.

However, many projects did not document and use a cost-benefit analysis framework to analyze the cost effectiveness of the interventions implemented. Further research is needed to evaluate the overall cost effectiveness of each of the projects, which was largely beyond the scope of this particular project, but nonetheless remains an important component in assessing the value of a project.

4.9.2 RANKINGS

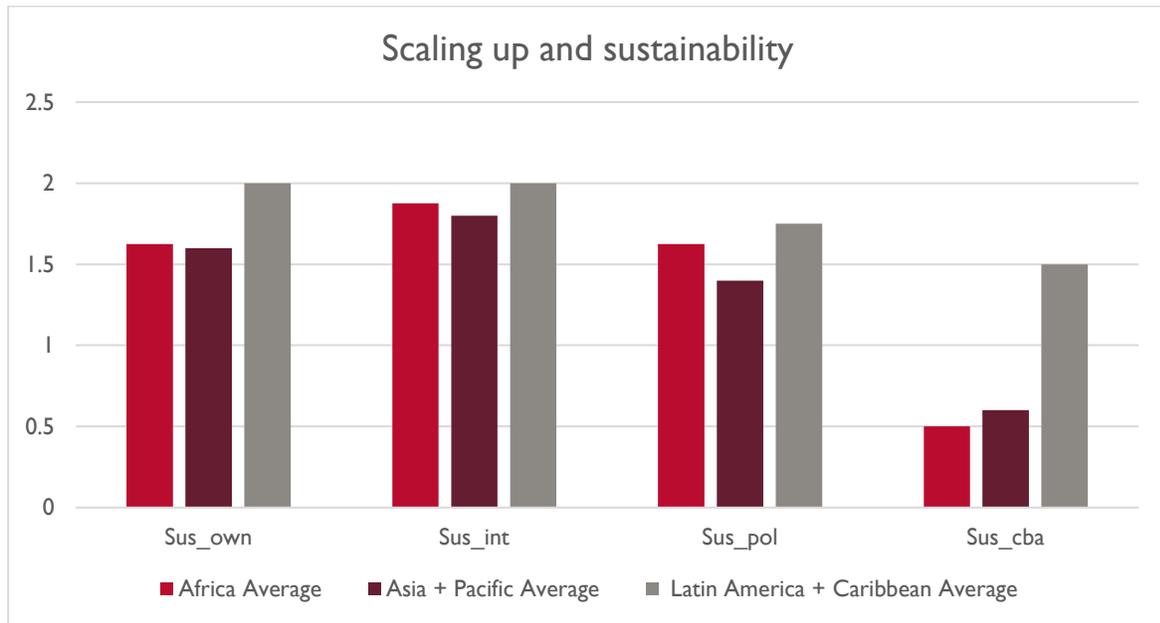
Three projects achieve a perfect score in the scaling up and sustainability practice:

- Implementation of Pilot Adaptation Measures in coastal areas of Dominica, St. Lucia and St. Vincent & the Grenadines
- Reduction of Environmental Vulnerability in Cuba
- Enhancing resilience of coastal communities of Samoa to climate change

The main difference between these projects and other high scoring projects in this practice is the inclusion of cost-benefit analyses. In most of these projects, the cost-benefit analyses conducted were done at individual project sites. All projects additionally worked with national adaptation and development plans, and engaged with additional policy instruments throughout the project duration.

One of the projects that struggled the most in sustainability and scaling up considerations was the project Strengthening the “Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events in Thailand”, where local ownership was high but national ownership was not, meaning that the communities lacked the resources and administrative support to continue with a lot of pilot projects.

4.9.3 REGIONAL ANALYSIS



The regional average scores for scaling up and sustainability were all relatively high, and consistent with the average overall regional scores.

5.0 WA BiCC COASTAL ADAPTATION ACTIVITIES

5.1 INTRODUCTION TO THE WA BiCC PROGRAM

5.1.1 OBJECTIVES

The overall goal of WA BiCC is to improve conservation and climate-resilient, low emission growth across West Africa. Although regional in scope and design, WA BiCC focuses on targeted areas (or learning landscapes) within the region to strengthen governance and policy related to critical natural and human systems. At its core, WA BiCC is a learning program that identifies, generates, synthesizes, and disseminates lessons learned, best practices, research questions, and other information relevant to its mandate to combat wildlife trafficking (CWT), increase coastal resilience to climate change, and reduce deforestation, forest degradation, and biodiversity loss.

WA BiCC generates knowledge and information from five coastal and forest “learning landscapes,” identifying additional gaps in knowledge, lessons learned, and best practices. This adaptive educational framework translates to collaborative work with regional partners, projects, and programs working on issues of common interest. In line with USAID West Africa’s Regional Development Cooperation Strategy, the project seeks to strengthen institutional and informational linkages between policymakers and practitioners.

5.1.2 WA BiCC THEORY OF CHANGE

The USAID West Africa (USAID/WA) Theory of Change (ToC) is included in the USAID West Africa Mission’s Regional Development Cooperation Strategy, illustrated in Figure 9. By strengthening collaboration at regional, national, and local levels, the ToC aims to ensure that regional policies filter down to the national level and are in turn informed by local practices. This knowledge management and learning approach (KML), combined with an increasing effort to apply research, underpins all of WA BiCC’s activities.

5.1.3 WA BiCC’S COASTAL ADAPTATION WORK

WA BiCC’s work on coastal adaptation (Component 2 of its work program) has allowed local and regional stakeholders to experiment with a number of approaches to developing coastal resilience to climate change. At its core, Component 2 seeks to build from and contribute to existing data and information. This foundational work facilitates the integration of coastal issues into public policy such as National Adaptation Plans (NAPs) to strengthen the resilience of people, communities, and ecosystems in coastal areas.

The site-based activities in coastal learning landscapes in Sierra Leone and Côte d’Ivoire serve as pilot actions for the implementation of national and regional policy frameworks such as Sierra Leone’s Integrated Coastal Zone Management Plan and the Abidjan Convention Protocols on Sustainable Management of Mangroves and Integrated Coastal Zone Management. Through initial implementation of these protocols, WA BiCC is also testing regional policies, such as the ECOWAS (Forest Convergence Plan and Environmental Protection Plan) and Mano River Union (MRU)’s Strategic Plan. WA BiCC is undertaking this in the context of implementation of actions on two coastal landscapes in Sierra Leone

and Cote d'Ivoire to further strengthen that approach as a sustainable partnership and governance arrangement for local communities and the national government. Activities in Cote d'Ivoire are being implemented by IMPACTUM, a local grantee. In the SLCLC, activities are being implemented by a small technical team of WA BiCC staff in close collaboration with local communities, government agencies and other partners.

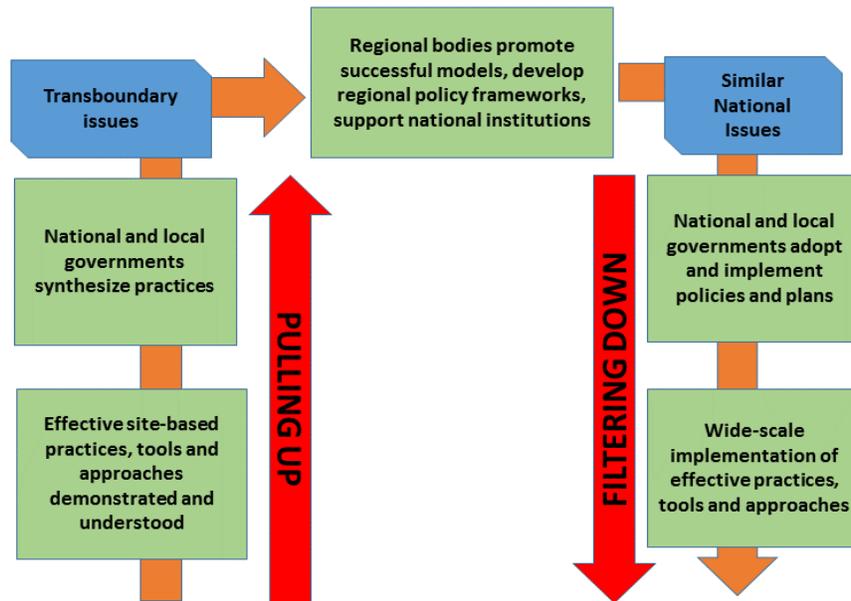


FIGURE 9: THE USAID WEST AFRICA THEORY OF CHANGE

Given that WA BiCC prioritizes replicability, scalability, and sustainability of pilot actions, all activities are planned and carried out with the full involvement of key stakeholders at local and national levels. This strategy ensures that similar work will be sustained after direct WA BiCC funding and involvement ends.

Theory of Change for Increasing Coastal Resilience to Climate Change

As illustrated in Figure 10 below, Component 2 approaches coastal resilience and adaptation using two Strategies depicted in the above ToC diagram (Figure 9):

- 2A. Identify and promote effective interventions
- 2B. Develop an enabling policy environment

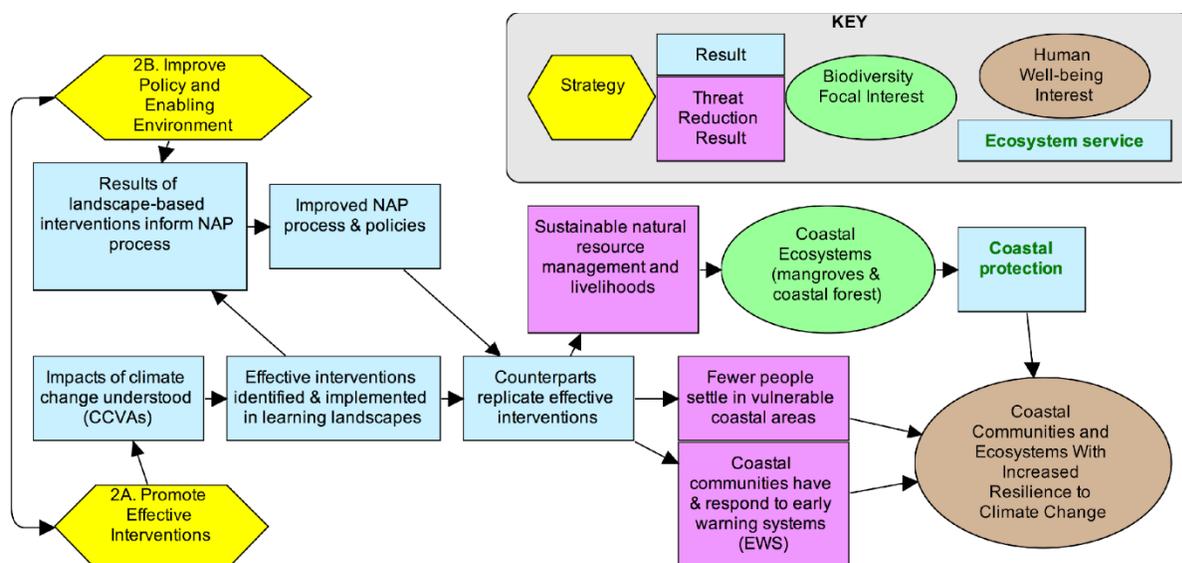


FIGURE 10: THEORY OF CHANGE (TOC) GUIDING COMPONENT 2 OF THE WA BiCC WORK PLAN.

WA BiCC’s landscape approach for all site-based activities in coastal areas

To ensure adequate understanding of the challenges, risks, and impacts of climate change and other drivers of coastal degradation, WA BiCC uses a step-wise approach to conduct a root cause analysis, thereby identifying the underlying causes of climate change impacts so that the most effective solutions can be identified and implemented. This stepwise approach includes:

Step 1: Consultation with relevant national and local institutions to confirm that a Climate Change Vulnerability Assessment (CCVA) is needed and/or useful.

- This step is of paramount importance because it clarifies the target country's interest in a CCVA and ensures the cooperation of relevant institutions.

Step 2: Scoping Study. A cursory investigation of the landscape to appraise interactions between local communities, stakeholders and ecosystems.

- This step helps to define a geographic and thematic scope, observe the environment, gauge drivers of change, identify partners and capacities, and identify community assets and dependencies.
- It also facilitates decision-making with regards to the scope of work, offering an assessment of the capacity of WA BiCC and its partners to conduct a CCVA.

Step 3: Climate Change Vulnerability and Risk Assessment. A detailed and integrated analysis of the exposure, sensitivity, and adaptive capacity of communities and ecosystems, as well as interpretation and efforts to develop vulnerability indices. Includes the following:

- Assess the extent of change in coastal ecosystems and anthropogenic drivers of that change.
- Conduct household surveys and community focus group discussions to understand livelihood strategies and dependency on ecosystem services.
- Map and analyze stakeholders, ensuring that gender-specific needs are understood.

- Conduct a climate risk analysis and by identifying and mapping types of hazards, future predicted hazards, and their impacts on households, community and ecosystems.
- Assess the responses of households, communities, ecosystems, and institutions to prevailing and prospective climatic hazards.

Step 4. Options Analysis. Identification and selection of options for adapting to climate change.

- Share CCVA results with local and national stakeholders.
- Identify options for mitigating vulnerabilities.
- Prioritize adaptation options based on determined efficiency, local context, and available resources.

Step 5. Participatory Decision-making.

- Ensure that interventions have community buy-in, have little to no environmental impact, and are compliant with existing legislation and administrative requirements.
- Conduct participatory land-use mapping, ground truthing, identification of root drivers of change, and stakeholder analysis.
- With the involvement of academia and relevant stakeholders, gather information on traditional practices, perceptions of adaptation initiatives, existing scientific research, and biophysical data on resources such as soil and water.
- Create a shortlist of solutions based on research and community perspectives.

Step 6. Institutional Arrangements and Partnerships.

- Promote ownership by ensuring stewardship by community members. Examples for promoting community leadership include cash-for-work initiatives and community monitoring systems.
- Facilitate stakeholder partnerships to encourage synergistic efforts and avoid duplicating work.
- Create new or strengthen existing institutions. Examples include the Community Chiefdom Natural Resource Management Network, Village Saving and Loan Associations (VSLA) groups, the Community Management Committee in Sierra Leone, and the Local Steering Committees and Village Committees in Fresco, Cote d'Ivoire.
- Build or strengthen institutional capacity (i.e. offer trainings on early warning systems, mangrove restoration, etc.)

Step 7. Participatory Action Planning and Strengthening of governance structures

- Work with relevant stakeholders to divide the landscape into manageable units.
- Identify and agree on roles and responsibilities.
- Develop an outreach and communications strategy.
- Develop a resources mobilization strategy.
- Acknowledge the risks on development encroachment and leakages.

Step 8. Implementation.

- Promote green infrastructure for Disaster Risk Reductions (DRR) and food security (i.e. embankments, rice-mangrove integration, mangrove restoration).

- Raise community awareness through strategies such as creating posters, producing a radio drama series, and including the topic in radio talk shows.
- Develop and enforce community management mechanisms such as bylaws, sustainable off-take, core protection areas.
- Promote climate smart agriculture and nature-based solutions as a means of sustaining livelihoods and protecting people from floods.
- Ensure that the necessary training resources are available to farmers.
- Promote local sustainable financing mechanisms such as village savings and loans
- Promote social learning, visioning and adaptive management such as exchange visits

Step 9: Establish a Community Monitoring System

- Identify and train community leaders on basic data collection and monitoring techniques
- Use monitoring data to assess factors driving ecological change, such as land use, stakeholder capacity, and community livelihood strategies
- Integrate monitoring data into future landscape management

Introduction to WA BiCC's coastal landscape activities

Mangroves are a key component of coastal resilience in West Africa, as demonstrated in USAID-funded research conducted in preparation for the WA BiCC project (Njisuh et al. 2014). Sea level rise, changing water characteristics, and shifting sedimentation patterns all threaten to disrupt mangrove habitats, while pollution and overharvesting tend to degrade mangrove stands (USAID 2009). Mangroves are vulnerable to the effects of climate change. But they also serve as an important component of coastal resilience by providing protection against erosion, breeding sites for fish, and economic opportunities for inhabitants. For all these reasons, WA BiCC made mangrove conservation a major component of its activities under Component 2 in Sierra Leone to increase Coastal Resilience to Climate Change.

The project has two major on-the-ground coastal learning landscapes: the Sierra Leone Coastal Landscape Complex (SLCLC) project and the Fresco Coastal Landscape Project in Cote d'Ivoire. The SLCLC project was established earlier (in 2017) and is larger, covering multiple mangrove forest areas, whereas the Fresco project was initiated later (in 2019) and covers the Fresco Lagoon and its associated mangrove complex, upland forests, two rivers and their watersheds, and farmlands, situated approximately 201 km west of Abidjan. Vulnerability assessments and related ecological studies were conducted in both project areas in order to build a knowledge base so that more appropriate national and regional coastal management plans could be developed (e.g. Mondal et al. 2018, Trzaska et al. 2018, Saloman 2019a, b, c).

A number of policies, strategies, and legislative frameworks were tested and implemented with the landscape approach in mind, including the Integrated Coastal Zone Management Plan of Sierra Leone and the Protocols of the Abidjan Convention on Sustainable Management of Mangroves and Integrated Coastal Zone Management (Tiega 2019). The projects are not directly comparable to those described in Sections 3 and 4 of this report. Therefore, while we do address conformity with the "Adaptation Good Practices Checklist" developed by the CARE Climate Change & Resilience Information Centre, there is no attempt to score them as was done for the 17 projects.

The Adaptation Good Practices Checklist overlaps significantly with USAID's Theory of Change, which emphasizes strengthening regional, national, and local efforts in the interests of ensuring that internal technical capacity, governance, and community organizations have strong, sustainable working relationships. The extent to which WA BiCC activities in the SLCLC and the Fresco coastal landscape are aligned with good practices can therefore be assessed according to a larger goal of creating a lasting framework for climate change adaptation. In keeping with USAID's Theory of Change, WA BiCC supports regional stakeholders, ensuring that its efforts in both Sierra Leone and Cote d'Ivoire are aligned with agreements like the Abidjan Convention (Tiega 2019).

Along with a broader Theory of Change, USAID developed specific guidelines for effective coastal adaptation grounded in the idea that a healthy and dynamic shoreline is more resilient against future hazards, be they economic or environmental (USAID 2009). Detailing considerations such as a project's technical effectiveness, expected cost and benefit, and implementation characteristics, the guidelines correspond well with the Good Practices Adaptation Checklist. Both prioritize strong institutional linkages, capacity strengthening, preliminary evaluations of data resources and needs, and the development of a reliable local foundation for adaptation work.

WA BiCC has identified ecosystem-based adaptation, including mangrove restoration, as a critical tool for community and ecological resilience. With the right combination of field evaluation, multi-stakeholder collaboration, and implementation, ecosystem-based adaptation offers coastal communities unique economic and ecological possibilities. For instance, replanting mangrove has been shown to increase the mangrove habitat by about 30% in two years in some coastal areas (USAID 2009). Identifying and ensuring the health of key climate refugia helps protect the health of a broader ecosystem and protect fisheries, since mangroves serve as an important nursery for fingerlings. Mangrove restoration also helps ensure a safer coastline (USAID 2009, 37).

As demonstrated in the project descriptions below, USAID prioritizes institutional entry points as a means of enacting coastal adaptation interventions. These include frameworks such as local authorities and community groups, the Abidjan Convention, municipalities and government agencies, established non-governmental organizations, national budgeting processes, and private sector parties such as tourism and sectoral investments. The projects at SLCLC and Fresco have used one or more of these entry points and are strongly informed by global and institutional adaptation guidelines.

5.2 THE SIERRA LEONE COASTAL LANDSCAPE COMPLEX (SLCLC) PROJECT

5.2.1 PROJECT DESCRIPTION

WA BiCC categorizes adaptation in the SLCLC into three focal areas (themes): Ecological restoration and management of critical coastal ecosystems, livelihoods and sustainable development, and disaster risk reduction and early warning systems.

- 1) The first theme, ecological restoration and management of critical coastal ecosystem, aims to build healthy coastal ecosystems by facilitating mangrove restoration and management as an ecosystem-based adaptation/mitigation solution. Mangrove restoration and management constitutes an ecosystem-based solution for both adaptation and mitigation of climate change. Healthy and productive mangroves can, among other adaptive benefits, capture carbon. WA BiCC supports efforts to mainstream adaptation considerations into coastal ecosystem conservation, encouraging

shared planning and decision-making, as well as increasing access to and co-production of information on climate trends, impacts, risks, and adaptation opportunities.

- 2) The second theme, livelihoods and sustainable development, sustains healthy and resilient communities by providing people with sustainable alternatives to making a livelihood, supporting efforts to raise awareness, and increasing skill-based trainings.
- 3) The last theme, disaster risk reduction and early warning systems, focuses on building resilience through appropriate infrastructure, supporting particularly vulnerable regions, and reducing hazards and risks.

The SLCLC comprises several locations where WA BiCC activities have been concentrated - notably the Scarcies River Estuary (SRE), Sierra Leone River Estuary (SLRE), Yawri Bay, and Sherbro River Estuary (SRE) (Figure 11). In order to increase coastal resilience to climate change in the SLCLC, WA BiCC developed strategies and actionable work plans tailored to particular community needs. In line with the Theory of Change for WA BiCC's Component 2, the program's dual strategy has been to identify and promote effective interventions while developing an enabling policy environment. In the Sierra Leone Coastal Landscape Complex, the work plans now being put into practice have been developed in collaboration with and active support of the Sierra Leone National Protected Area Authority (NPAA) and the Coastal Chiefdoms Natural Resources Management Network (WA BiCC third annual report).

WA BiCC has categorized its activities in the SLCLC according to their contributions to broader goals for adaptation in the area. Recognizing the importance of accurate information to effective intervention, WA BiCC sought to build an understanding of the landscape and local communities through a preliminary vulnerability assessment in February 2016 (de Sherbinin and Trzaska 2016) and detailed vulnerability assessment in July 2016 (Trzaska et al. 2017a and 2017b). It also built on similar vulnerability assessments conducted elsewhere in the region.

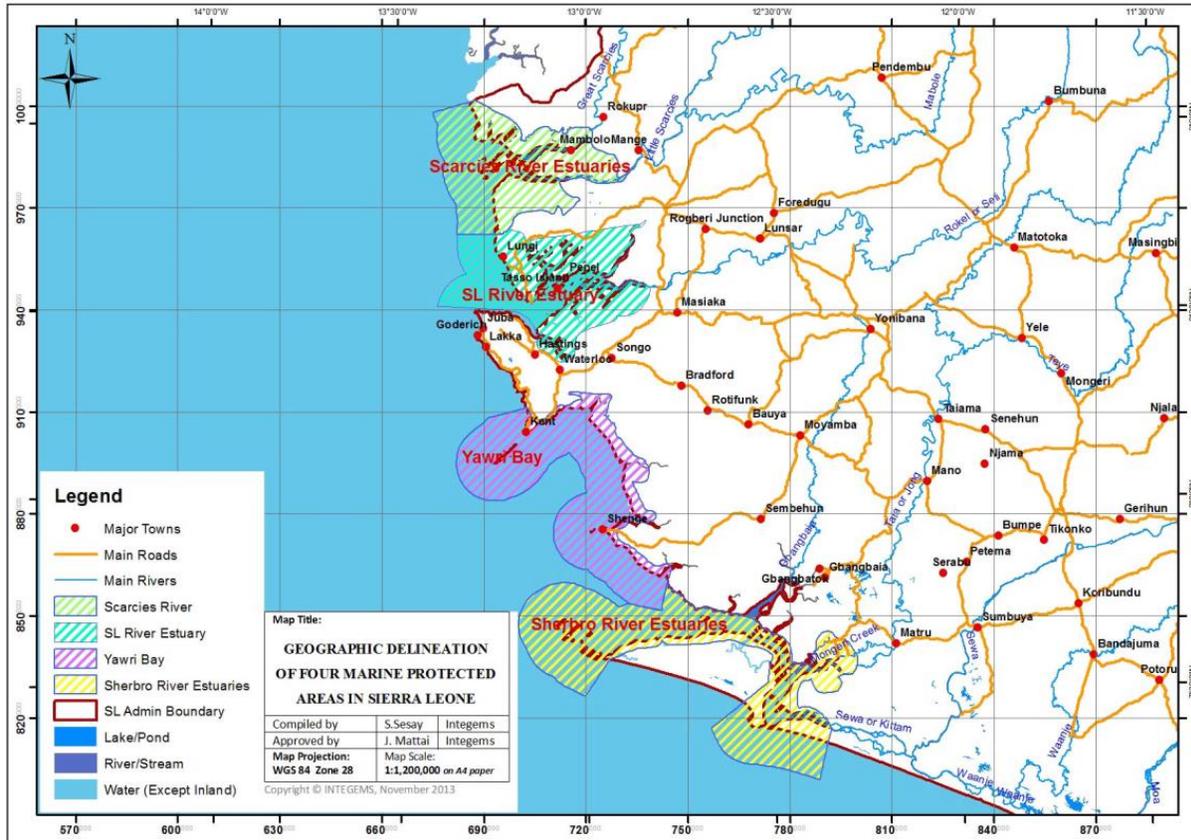


FIGURE 11: ESTUARIES AND BAY IN THE SLCLC (SOURCE: EPA 2015A PP.9)

Monitoring and evaluation of coastal adaptation practices consistently finds projects to be more effective and likely to create lasting change when they are built into existing institutions. WA BiCC's work plan for the SLCLC therefore prioritizes collaborative activities in which climate change adaptations are owned and maintained by governments, private partners, and local communities (Tetra Tech 2019). On April 2, 2019, WA BiCC partnered with the UNDP (United Nations Development Program) to support a government workshop in which members of the government, technical and financial partners, civil society, Traditional Chiefs, and the community reviewed and revised a Climate Change Adaptation Plan (CCAP) for the Sierra Leone coastline. Prof. Foday Moriba Jaward, Minister of the Environment, Government of Sierra Leone officially endorsed and launched the CCAP on 6 February 2020. The CCAP is now part of the national policy framework.

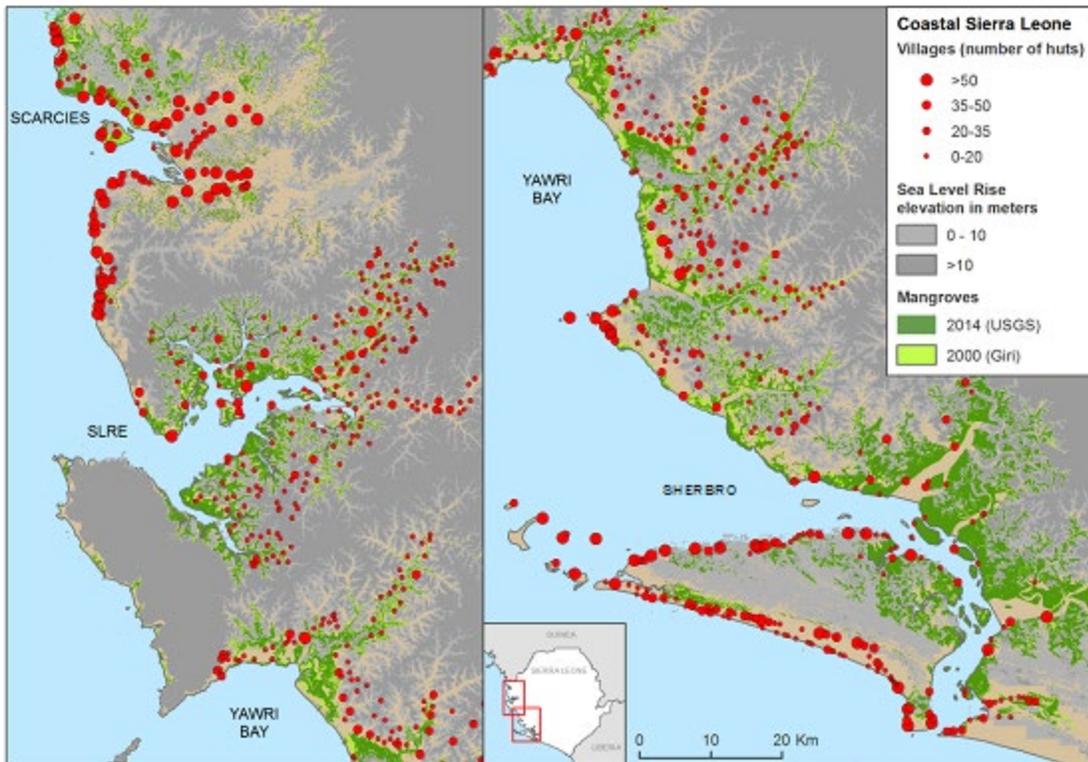


FIGURE 12: MANGROVE EXTENT AS OF 2014 (DARK GREEN) AND 2000 (LIGHT GREEN), ALONG WITH MANGROVE SETTLEMENT SIZE AND LOCATION INFORMATION.

Sources: The year 2000 mangrove layer is from Giri et al. (2013), and the 2014 mangrove layer is from unpublished data provided by Gray Tappan, USGS Eros Data Center. Note that both the 2013 and 2000 layers used Landsat imagery, but that the methods differed, and hence the mangrove layers are not directly comparable.

Mangrove planting has been important to the project from its inception. WA BiCC kickstarted work by conducting participatory mapping, addressing land tenure issues, community trainings, and establishing nurseries. Over time, they moved from nurseries to the collection of natural propagules (wild shoots). By the second year, community groups were encouraged to select their own sites. Now, community members prepare plants, organize work parties and monitor planting and growth in exchange for small stipends. The project found that community members depended on some level of payment for their work, which was built into the project design. Regeneration areas are typically located near the 24 target villages so as to enhance coastal protection. Additional efforts were made to develop flood protection measures using local materials, since seasonal flooding of fishing villages is a common problem.

WA BiCC also supports efforts to increase community awareness of climate change and its consequences on coastal landscapes and livelihoods. The project invested resources in a twenty-four-episode radio drama, *Watasay Ston* (Unmovable Rock). Released in four languages—English, Krio, Themne, and Mende—the series was crafted using information from the Vulnerability Assessments. From October 10 to 12, 2018, a workshop was held to design the radio drama, using a set of existing WA BiCC data, including the results of the Vulnerability Assessment, Options Analysis, and lessons

learned from site-based activities in the SLCLC. Workshop participants reviewed dominant threats to coastal mangroves, critical community vulnerabilities, and the Knowledge, Attitude and Practice (KAP) document which serves as a guide to ensure Behavior Change Communications objectives are met. Discussions revolved around critical issues in the coastal landscape including indiscriminate cutting of mangrove wood for fish smoking, oyster harvesting, sand mining, illegal, unreported and unregulated fishing. Socio-cultural, economic, and legal nuances render these issues all the more complex. Participants developed radio drama character profiles and storylines. They also identified appropriate languages for the drama's production and radio stations for broadcast while developing a promotion plan to ensure wide listenership.

The United Nations Development Program (UNDP) was involved in the entire process. As a result, UNDP discovered an opportunity for partnership between WA BiCC and UNDP, as the two organizations share similar program objectives, especially with regard to leveraging communications products to change behavior. UNDP decided to fund Season 2 of the radio program after the termination of Season 1. WA BiCC will nonetheless remain involved in the radio series. Recently, Wetlands International, a global organization implementing a new Mangrove Program in the Sierra Leone coastal landscape and across West Africa, expressed interest in funding Season 3 of *Watasay Ston*.

In 2019, WA BiCC shifted efforts from the Sierra Leone River Estuary (SLRE) to the Sherbro River Estuary (SRE). This change in priority is the result of significant World Bank support for the SLRE Management Plan, prompting WA BiCC to adapt its strategy so as to support but not duplicate efforts in that region. WA BiCC largely focuses on institutional strengthening and capacity building in SLRE. The shift to SRE was also prompted by the existence of larger stands of intact mangroves, and emerging pressures from mining and rice cultivation. The shift in priorities was validated not only by consultation with parties on the ground, but also by visits to the area by USAID West Africa and USAID Sierra Leone representatives (Tetra Tech 2019).

In light of this shift in priorities, WA BiCC is developing and implementing plans for the SRE. The project officially began developing a Co-Management Plan (CMP) for the coastal area in March 2019. Its launch event included 200 participants and raised awareness of the social, economic, and ecological importance of mangrove areas, as well as threats to their long term sustainability. Co-management engages communities by delegating responsibility to protect natural resources while conferring local rights of access (Borrini-Feyerabend 1997). The launch was followed by consultations with community members and leaders, including ten chiefdoms and two councils. A September 2019 stakeholder workshop defined the process and developed a framework for the Co-Management Plan. Twenty institutions took part, solidifying community, NGO, and government partnerships.

The Sherbro River Estuary Co-Management Committee (SRE CMC) will lead the implementation of the Sherbro River Estuary Co-Management Plan. The Committee was established from the 20th -23rd of January 2020 in Bo, Southern Sierra Leone. It is an Implementing body made up of 11 members elected from the 10 chiefdoms of Sherbro region and an additional member from Bo district council. Following the elections and endorsement of executive members of the SRE CMC, an assessment was conducted to identify the capacity needs of the newly formed institution in governance, communication, resource mobilization, and management. The capacity action plan resulting from this assessment will guide WA BiCC, NPAA, and other Ministry Departments and Agencies (MDAs) on required actions to enhance the capacity of the SRE CMC.

The SRE CMC also includes an advisory board made up of 10 paramount chiefs who function as custodians of the SRE and local councils; a supervisory body consisting of the NPAA and other government MDAs, such as the Ministry of Fisheries and Marine Resources and the Environmental Protection Agency; and observers, such as local CSOs, NGOs, and related organizations.

This newly established community-based governance structure came to fruition after 9 months of intensive stakeholder consultations and community mobilization processes. The executive members are expected to work closely with the NPAA and other relevant MDAs to support the implementation of a Co-Management Plan that promotes the sustainable management of mangrove forests and other coastal resources through customary authority, local rulemaking, and local-level enforcement.

A number of representatives of this new governance structure were trained in Global Positioning Systems (GPS) and mapping technologies with the intention of developing a co-management plan for the coastal region, with preliminary exercises conducted in Dema, Timdale, and Bagruwa. Data collected in this mapping exercise allowed stakeholders to clarify the spatial distribution of a range of coastal land cover systems, including mangroves (Njisuh 2019).

The Co-Management Plan was validated in September 2020. . The validation of the Co-Management Plan culminated in the CMC and government representatives formally signing a co-management agreement, recognizing and authenticating the rights, responsibilities, benefits and existing relationships of the stakeholders.

Finally, the project directed efforts towards building leadership and fund-management for 25 communities across the SLCLC. First, the program trained these areas on adapted approaches to restoration that emphasize drawing leadership directly from local communities. The program then worked to strengthen Village Savings and Loans Associations (VSLAs) to improve resilience to natural and economic shocks and to strengthen the ability of coastal communities to advocate for themselves. The work on VSLAs emerged from the realization that participants in a mangrove planting initiative had few options for depositing savings, prompting the the project to offer the VSLAs technical support. Training focused on management, registration, and communications. Particular efforts were made to encourage the participation of women in VSLA and microfinance trainings.

Significance of the Sherbro River Estuary Co-Management Plan

For local and national stakeholders, this is the first time that a marine and coastal landscape in Sierra Leone benefited from an inclusive, participatory, and stepwise process including:

- Iterative consultations with all local communities and national institutions to collect relevant data and generate useful information through workshops, training sessions, Participatory Rural Appraisals (PRA) and Participatory Mapping.
- Opportunity provided to all active key stakeholders to review the vision, principles, and the content of the Co-Management Plan, including all strategic and operational actions
- Open and transparent discussions of all management options.
- Consensus and agreement on realistic sharing of responsibilities and benefits.
- Initiation of discussions on how relevant stakeholders' representatives will be involved in implementing the Co-Management Plan.
- Ensuring buy-in by directly engaging stakeholders.

- At regional level, the development and adoption of the Co-Management Plan and Ramsar Site designation constitute a stimulating and innovative pilot process that encourages other countries to replicate this achievement and promote regional policies/strategies, and legislative frameworks such as the:
- Ratification, domestication, and implementation of the Abidjan Convention Protocols on Sustainable Mangrove Management, and Integrated Coastal Zone Management;
- Implementation of the Strategic Plan of the Mano River Union (MRU) through replication of the process to design, adopt, sign, and initiate the implementation of new Co-Management Plans that involve local and national stakeholders in each MRU country.
- Further implementation of the ECOWAS Environmental Policies and Strategies, using participatory landscape management to improve the conservation and sustainable use of protected areas in West Africa with a focus on ecosystem-based climate change mitigation & adaptation.

5.2.2 MAJOR ACHIEVEMENTS

Sierra Leone's Climate Change Adaptation Plan (CCAP) benefited from extensive revisions at the April 2, 2019 national workshop organized in partnership with UNDP. More than 40 participants helped mainstream climate adaptation into national policy frameworks, collaborating to align the CCAP with the National Climate Change Strategy and Action Plan. Participants helped write a plan that enhances national strategies for climate change. A section was added to elucidate how regional policies/strategies could be integrated from the Abidjan Convention's protocols on Integrated Coastal Zone Management (ICZM) to Sustainable Mangrove Management and ECOWAS's Environmental Policy (ECOWEP). The collaborative environment of the actual workshop enabled greater cross-institutional support for coastal resilience. Sierra Leone's Environmental Protection Agency (EPA), for example, offered its support and commitment to continued work (WA BiCC 2019). Finally, efforts were made to plan next steps, with various government ministries and agencies discussing alignment of the plan with their particular mandates.

The 24 radio drama episodes were well-received. Their production has been led by community members, and the episodes themselves appear to be reaching local leaders. Radio dramas are a part of Sierra Leone's rich culture; it is therefore no surprise that "Watasay Ston," a new radio drama series and form of entertainment-education, has quickly emerged as one of the most popular in the country. All stakeholders, including the government, donors, communities, drama producers and radio stations, have taken ownership of the series and continue to iterate on lessons learned to improve messaging and increase listenership. Season I aired on four radio stations (Africa Young Voices Radio, the Sierra Leone Broadcasting Corporation, Radio Peninsula-Tombo and Radio Bontico in Bonthe) between July 2019 and January 2020. During this period, a monitoring and evaluation (M&E) study was conducted in 24 coastal communities in which the show was aired to measure the listenership of the program and the effectiveness of the messages. The M&E assessment revealed that 17 out of 24 communities listened to the radio drama and call-in show, and listeners included women and men of all ages. Community members reported that the series encouraged more climate resilient action, such as enforcing by-laws on conservation and conducting selective cutting of mangroves and plant mangroves. They also said the radio program has generated discussions on the negative effects of cutting mangroves, the dangers of flooding, and the construction of embankments to protect the communities from coastal erosion. A

total of 287 call-ins (78% males and 22% females) were made to the four radio stations within the first three months of airing. Callers included fisherman, farmers, fish sellers, community leaders and students.

While implementation of coastal adaptation activities and enactment of the Co Management plan in the SRE is still in its early stages, the mapping exercise was a significant achievement for the region. Undertaken in collaboration with local communities and government partners such as the National Protected Areas Authority/Conservation Trust Fund (NPAA/CTF), the field mapping built capacity for collection of data and its application in future adaptation (Njisuh 2019). Prior mapping efforts had not included community members. This work built a broad capacity for using geo-spatial information technologies, as well as public investment in climate change issues across the coastal area, while also contributing to a more robust foundation of climate information to enable future development.

Support to the VSLAs has already resulted in tangible progress for impacted communities. Since the training was conducted, 78 VSLAs have been registered. The 35 VSLAs registered at the Council level have developed official bylaws or constitutions, while 43 have registered at the town chief level (Tetra Tech 2019). These registered groups collectively mobilized US\$90,455, and 75 of them provided loans to a total of 1,788 people. This subsequent 91% increase in capital creates a promising financial landscape for future work in the area. Women represented 52% of the 159 participants in a 2019 training to support the growth of VSLAs in the SLCLC. Compared to participation in VSLA capacity strengthening in West Africa as a whole, where women currently make up 28.06% of 1,532 trainees, work in the SLCLC is making strides towards more equitable sustainable development.

5.2.3 ASPECTS THAT CONFORM TO GOOD PRACTICES

Much of WA BiCC's work in the SLCLC aims to develop a strong foundation for continuous efforts to rehabilitate mangroves, build resilience and, where necessary, adapt to changing coastlines. Grounding adaptation measures in existing institutions, policy frameworks, and data infrastructure is critical towards ensuring that projects are sustainable and suited to the long term nature of climate adaptation. Indeed CARE's Good Adaptation Practices Checklist highlights the importance of institutional linkages, extensive data collection and assessment of risks and vulnerability, and collaboration with government and policy (CARE 2016). WA BiCC's April 2, 2019 national workshop mainstreaming the Climate Change Adaptation Plan into the National Climate Change Strategy and Action Plan was therefore critical towards ensuring government buy-in. It helped to develop an environment of collaborative adaptation, connecting common goals and work, in order to reduce isolated workflows and over-extended resources in the long term. The workshop received WA BiCC and UNDP support for organization and finance, but it was government planned and led.

WA BiCC's decision to shift priorities away from the SLRE and towards the SRE, thereby avoiding duplicating efforts and instead supporting a vulnerable coastal region that had previously not been allocated the same level of resources, demonstrates a flexibility that is a hallmark of good adaptive management. The SRE is home to the largest concentration of mangroves in Sierra Leone, 58.2% of the national total (WA BiCC 2018a). They are home to important flora and fauna, providing refuge to Palaearctic and intra-African migratory birds. From 1990 to 2016, Sierra Leone's coast has lost 25% of its mangroves (Mondal et al. 2018), threatening biodiversity and human life. Recognizing this critical area and diverting resources to assure that they are directed as effectively as possible, in coordination with

other stakeholders and investors, demonstrates an ability to adapt to local needs that is fundamental to effective coastal resilience.

The program also demonstrated its adaptability in task 3.3, in which 25 SLCLC communities were trained on an adapted approach to restoration based on lessons learned in past years of adaptation efforts (Tetra Tech 2019). Some key lessons included the importance of community leaders initiating restoration activities. Adaptability is linked to effective monitoring and evaluation, which WA BiCC has undertaken to assess technical work, environmental impact, and grant management.

5.2.4 CHALLENGES AND LESSONS LEARNED

Building trust and multi-stakeholder commitment to full participation and ownership requires significant time and effort. It took WA BiCC three years to access certain key institutional documents. The newly established community-based governance structure emerged after 9 months of intensive stakeholder consultations and community mobilization processes, with extensive funding and leadership from WA BiCC.

Finally, a key lesson learned is that building partnerships with a wide array of institutions at different levels is a prerequisite for success. WA BiCC works closely with many institutions at local, national, and regional levels to ensure coastal resilience activities are replicable, scalable, and sustainable. This requires planning activities with the full involvement of key stakeholders at local and national levels such that there is community ownership of processes, outputs/outcomes, and future commitments to coastal adaptation without WA BiCC's direct participation.

5.3 FRESCO COASTAL LANDSCAPE PROJECT

5.3.1 PROJECT DESCRIPTION

Cote d'Ivoire's coastline hosts a variety of ecosystems, including tidal estuaries, lagoons, sand spits, and mangroves. All are under substantial pressure from human activities. In the context of climate stressors and ecological degradation, the country is grappling with unique threats to its southwestern mangrove forests, including the Fresco estuarine and lagoon mangroves, where WA BiCC is managing a coastal landscape project. Long overlooked, this area has experienced considerable degradation in the past few decades. Since 1990, the lagoon has lost 36% of its mangrove cover, with only 4 square kilometers of mangrove remaining (CIESIN 2020). A recent report found a high rate of coastal erosion, with land loss at an average of -0.6 meters per year from 1962 to 2018 (Salomon 2019a). Recent storm surges and continued climate change has accelerated the rate of erosion, with some studies putting current rates between -1.2 to -2 meters per year.

WA BiCC began its work in Fresco with an initial scoping mission in February 2016, when the WA BiCC team met with the mayor and local authorities, touring the lagoon, the sand bar, and the mangrove complex before holding a meeting with villagers on the Bolo River (Tetra Tech 2016). Subsequent field work was carried out in 2018-2019, resulting in studies on the sedimentation of the lagoon, water chemistry, and land use in the surrounding areas (Salomon 2019b, c). The Fresco lagoon includes a long sand dune that normally blocks the ocean from the lagoon and periodically opens at a low point due to rainy season flows from the Bolo and Niouniourou rivers. A unique balance of fresh and saltwater is crucial to the animals and plants that inhabit the ecosystem, including the mangroves. The declining health of the mangrove forest and changing properties of the water and land are of

concern not only to the local community, but also to migratory birds that depend on the mangroves for survival.

In February 2019, WA BiCC officially announced a financial award to an Abidjan-based NGO, IMPACTUM, to increase coastal resilience in Fresco, an important coastal environment about 201 kilometers west of Abidjan (US Embassy 2019). In contrast to the SLCLC project, Fresco took a landscape approach that includes forest and land management in upland areas to manage runoff into the lagoon. The launch event, held on February 13, 2019 in Fresco, included a wide range of attendees, from traditional authorities and national institutions to civil society organizations and local media (US AID 2019). A field visit to the Fresco lagoon gave participants the opportunity to see the ecosystem firsthand, allowing residents and impacted community members to air concerns about climate change and adaptation measures.

The grant supports the creation of a local development plan, an adaptation plan, and a risk management plan. It has also allocated money towards activities to restore mangrove areas, rebuild inland forests in the watershed, and protect biodiversity. Priorities include providing fishermen with the tools to manage resources within the estuary, supporting upstream farmers in the use of sustainable agroforestry, and integrating climate change information into local policies. The work will be outlined in Community Development Plans that IMPACTUM has started to develop by way of participatory community meetings.

WA BiCC has committed resources to building capacity for monitoring and evaluation. In February 2019, the program held a three-day training on performance indicators, methodologies for collecting and managing data, electronic and physical filing, using reporting tools, and defining learning agendas. In August 2019, the program followed up with an assessment of the IMPACTUM's current monitoring and evaluation (M&E) capacity and a corresponding action plan and performance index baseline.

Work in the Fresco coastal landscape is linked to other national and regional commitments such as the Abidjan Convention (AbC) Protocols on the Sustainable Management of Mangroves and Integrated Coastal Zone Management (ICZM). Highlighting linkages between its coastal adaptation activities and the AbC Protocols, WA BiCC convened meetings with the Fresco Local Steering Committee to review studies on the coastline and relevant land use systems. The 29 participants identified important national and regional environmental policies, as well as current gaps in information needed to design a comprehensive local development plan. Key findings from subsequent studies are now being used to address these gaps. These studies were carried out in addition to a 2018 vulnerability assessment, contributing further analyses of the biological and chemical impacts of upstream activities on the Fresco Lagoon ecosystem, an analysis of changing land-ocean relations (i.e. the effect of sea level rise on coastal erosion), and an updated report on the evolution of land use systems and their impact on key ecosystems, from upland forests to watersheds. Data now exist documenting and analyzing variation in coastal erosion and lagoon depth as a result of anthropogenic activities and shifting sedimentary deposition patterns.

5.3.2 MAJOR ACHIEVEMENTS

Ensuring alignment between national commitments and coastal adaptation work plans, WA BiCC developed three documents that detail the project's overlap with the AbC Protocols, including a thematic factsheet on links between the Protocols and WA BiCC activities and two reports on WA

BiCC's contribution to the actual implementation of the AbC Protocol on Sustainable Mangrove Management (Tetra Tech 2019 and 2021).

WA BiCC identified critical information gaps in developing coastal adaptation measures in the interests of strengthening both its coastal adaptation activities and existing national and regional protocols. The program successfully undertook a number of assessments on the Fresco Lagoon ecosystem, from land use evolution to the impact of upstream activities on downstream ecological health. Important findings were submitted to the Fresco Local Steering Committee in December 2019. The Local Steering Committee discussed the findings of six studies, including the trends on sea level rise, changes of the position of the lagoon mouth, changes on land cover and land use systems, Hydrodynamics and Chemical and Microbiological Analysis of the Fresco Lagoon, Coastal sediment dynamics and hydrodynamics of Fresco Lagoon, Upland Forest Ecosystem Assessment and recommendations on Management Options, and Situational Analysis of a Regenerated Forest on an Island off Historic and Biological Significance in the Fresco Lagoon, Cote Ivoire . Results of the land cover and land use study reveal that current land use is accelerating the degradation of forests areas such that forest cover has seen a reduction of 56.29% from 1990 to 2017. As illustrated in Figure C, many of these forests have been converted into agriculture lands.

The on upland forest described and analyzed the conservation state of the Port Gauthier Classified Forest (PGCF) and Okromoudou Classified Forest (OCF,) and provided a better understanding of the current state of these two forests, with their contrasting landscapes: OCF is almost degraded, while PGCF is relatively well protected, including 58 species of wildlife, with even fresh traces of the presence of a herd of elephants. The critical analysis of the situation of these forests and the proposed solutions highlight the importance of an ecosystem-based approach to contribute to the resilience and adaptation of people and ecosystems in the Fresco landscape.

Management proposals, including four best practice options for improving the natural resilience of these forests are provided to contribute, if they were implemented, to enabling these forests to fully play their various ecological, scientific, economic, social roles.

Moreover, strengthening the governance of the forest authority (laws, regulations, means of operation) and the involvement of the populations in forest management will guarantee the sustainability of these forest resources.

In terms of wildlife, the results of this study should be used as a basis for setting up an appropriate wildlife inventory program and its monitoring, particularly in the PGCF, with a view to better protecting the wildlife species that still exist there.

Targeted studies should make it possible to specifically address the watersheds of the region's major hydrographic network to determine precisely, in consultation with the local population, the actions to restore these fragile forest landscapes.

This study is a pilot action that is expected to be extended to all coastal forests currently in advanced state of degradation (Dogodou, Bolo, Dassioko, Niégré, Monogaga, Rapides Grah, Haute Dodo forests).

It is important that the next development plan for Port Gauthier and Okromoudou forests consider the values and importance of these complex ecosystems so that they continue to play their ecological,

socioeconomic, cultural and scientific roles. Indeed, the implementation of an adequate Management Plan is desirable for these forests to:

- Maintain soil, surface and groundwater and biodiversity (plant and animal species);
- Increase a significant carbon retention capacity; and
- Contribute to the availability of water resources, in quantity and quality in the watersheds.

To ensure that these forests continue to play their role, the next Management Plan should also avoid certain harmful practices such as the replacement of old forests with new single-variety plantations and the negative impacts of possible timber harvesting under unsustainable concessions.

The local steering committee has decided to integrate findings from the six different studies into an Integrated Local Development Plan for the Fresco Landscape to increase the resilience of people and ecosystems that support the livelihoods of people, including upland forests, farmlands, rivers and their watersheds and estuarine mangrove, the lagoon and its mangrove, as well as the connection of the interactions between lagoon and the Atlantic Ocean. WA BiCC has partnered with the World Bank's West Africa Coastal Adaptation (WACA) project and will apply to the Green Climate Fund in the hopes of continuing work in the Fresco Lagoon. WA BiCC has also worked with WACA to adjust their programs—hitherto largely focused on urban areas and infrastructure—to recognize the importance of natural landscapes to coastal resilience.

Design and validation of an Integrated Local Development Plan (ILDLP) for the Fresco Landscape that includes risk management measures, management of the mouth of Fresco Lagoon, and livelihoods options to increase the resilience of people and ecosystems

The Integrated Local Development Plan (ILDLP) is an exceptional tool for translating national priorities into local development actions, offering a suitable and updated framework for future actions, including the preparation of a Proposal to be submitted to the Green Climate Fund (GCF).

The ILDP was designed through a participatory local planning for local development. It strengthens the links between stakeholders and their territory and the ownership of projects by the actors of the territory. This Plan helps to (i) maintain or ensure social cohesion, transparency in the management of local affairs, (ii) ensure consistency with the national policy and priorities defined by senior levels of planning, (iii) ensure the membership and participation of all social strata including marginalized groups in decision-making, (iv) taking into account gender and equity in prioritizing, setting directions, determining strategies and implementing development actions.

The overall objective of the ILDP is to reach agreement on adaptation measures, risk management for the municipality of Fresco and a management plan for the Ramsar Site. The ILDP should be used to control the regime of the Fresco Lagoon mouth (pass) connecting the lagoon and the ocean. This plan identifies climate-resilient activities conducive to good pass management and translates national policies, programs and strategies related to climate change and coastal environment management at the local level, taking into account the interactions between terrestrial and coastal ecosystems (forests, agricultural lands, rivers with their watersheds and mangroves), lagoon and mangroves, as well as the connection with the ocean.

Specifically, the ILDP:

- Establishes the Landscape's territorial diagnostic assessment;
- Takes stock of the Municipality's previous planning and structuring strategies;
- Establishes an update on sectoral programs within the landscape;
- Makes a summary of the Vulnerability of landscape with an overview of the recommendations of all studies (national and local), opinions of communities and local authorities on the priorities of action and opinions of the relevant national institutions;
- Proposes sustainable, realistic and efficient actions that increase the resilience of communities and landscape ecosystems;
- Conserves and make best use of opportunities and potential to contribute to the economic and social development of municipalities while preserving natural resources;
- Develops a roadmap for the implementation of the plan, considering sub-regional, national and local priorities and the capacities of local actors;
- Proposes concrete actions for the articulation between the ILDP and spatial planning tools (The Communal Master Planning, the Urban Development Master Plan, the Master Planning Scheme, etc.). To this end, it is making concrete recommendations on the integration of the spatial approach throughout the municipal planning process.

The need to take land use into account in Fresco's local development policy is justified by the fact that the ILDP is for social, economic, environmental and political purposes.

This ILDP is the result of all activities carried out with the members of the Local Steering Committee and the local population of Fresco in the context of participatory diagnosis, options analysis, and agreement on collective actions.

5.3.3 ASPECTS THAT CONFORM TO GOOD PRACTICES

In its work with IMPACTUM, WA BiCC has mobilized resources to ensure long term community ownership of coastal adaptation initiatives. Four IMPACTUM staff members based in Fresco manage the project and interact daily with local authorities, community groups, and government agencies. The NGO established a local steering committee composed of the village chief, *prefet* (mayor) and other local leaders to oversee project implementation and address community concerns. The local steering committee ensures ownership over processes, ongoing activities, and the development of future plans. The local steering committee relays community concerns and priorities to the national government while managing work with organizations beyond WA BiCC, such as a recent collaboration with the United Nations Food and Agriculture Organization (FAO) for a Community Fishery Initiative (CFI) to avoid duplication of efforts in establishing a new governance structure. The committee is committed to transparency and actively promotes collective actions that consider the interests of various groups. In order to ensure that national policies and legislative frameworks support local actions, the following developments are worth noting:

- The local steering committee is taking action to address alarming findings from a study on chemical and microbiological characteristics of the lagoon water and sediments. While most heavy metal levels in the lagoon and its rivers are not a cause for concern, the values of lead and mercury observed at certain stations (S3, S4 and S5 for lead, and S3 for mercury) are close to the proposed lower limits. The committee has decided to work with implicated parties, including the mining companies themselves, to reduce the impact of mining on water resources.

- There are similar concerns about the impact of agriculture on human health. When pesticides are drained and reach the lagoon, they pollute it and connected inland water resources. A study of these chemicals revealed concerns about the levels of pesticide molecules found in the sediments at every station in Fresco Lagoon. The levels of chlordane and dieldrin were above the proposed standards. Chlordane is a man-made persistent organic pollutant and popular pesticide that was popular in the United States from 1948-1988. Due to concerns about environmental damage and human health risks, the U.S. Environmental Protection Agency banned its use in 1983, except for controlling termites. It was then permanently banned in 1988, though its ecological ramifications persist. A survey conducted by the committee found that some farmers continue to use chlordane and dieldrin despite a 2004 ban on its importation, fabrication, and use in the country. In order to stop the use of all banned pesticides, the committee needs the full support of the central government.

WA BiCC emphasizes working with existing institutions and building regional capacity. Studies that show that adaptation measures are far more sustainable and effective when owned and managed by local stakeholders. While work in Fresco is quite recent, the past year has seen considerable efforts to ensure local participation and a strong foundation for future work. Along with the specific trainings detailed in their work plan, WA BiCC has held a number of additional workshops, trainings, and meetings collaborating with IMPACTUM and other partner organizations. For example, WA BiCC trained IMPACTUM on using carbon calculation to estimate emissions and storage of carbon in the mangrove and upland forests (WA BiCC 2020).

Monitoring and evaluation (M&E) is critical to ensuring coastal adaptation practices are effectively implemented and funded. Active monitoring enables flexibility, helping to safeguard adaptation measures from unexpected challenges. In keeping with the project's focus on community ownership over coastal adaptation, WA BiCC has approached M&E from the perspective of building capacity, favoring internal management over external monitoring. WA BiCC has kept with good practices by offering not only training for M&E, but also supporting financial stability so that these can be maintained in the long term. In 2020, WA BiCC plans to continue to develop monitoring while offering training and support through VSLAs (Tetra Tech 2019).

Following discussion with the Ministry of Environment, WA BiCC several studies conducted over the past decade that assess the vulnerability of coastal communities and infrastructure in Cote d'Ivoire to sea level rise and coastal storms and flooding. Existing studies, including the ones in Fresco, cover different segments of the coastline with different organizations and questions in mind. Together, these studies offer a wealth of information on potential vulnerabilities. WA BiCC and the Ministry of Environment and Sustainable Development have therefore decided to carry out a literature review synthesizing the main findings of these vulnerability assessments. Once integrated into a map of coastal vulnerability, this research will inform adaptation and resilience recommendations to the government of Cote d'Ivoire. The findings and subsequent recommendations will be shared with all relevant sectors in a workshop, allowing for broader collaboration and discussion. It is expected that Fresco will appear as one of the priority areas for actions, particularly because the area has initiated new approaches and options to address climate change and other risks to the resilience of people and ecosystems.

5.3.4 CHALLENGES AND LESSONS LEARNED

Challenges. All studies were made in line with principles established in the Integrated Coastal Zone Management Protocol of the Abidjan Convention and related agreements to address land-based pollution that impacts coastal areas and oceans and risks caused by upland human activities. Because of the complexities related to all these principles, it was difficult to get enough information and time to test the principles through site-based activities. The Fresco Grant was launched in February 2019 with a one year grant awarded to IMPACTUM. It is therefore expected that additional partners will take the project on. The Ministry of Environment and Sustainable Development, for example, will lead the development of a new partnership. WA BiCC's experience in Fresco will hopefully offer valuable insight to the NAP process and existing programs like WACA.

Selecting a suitable institution for the vulnerability assessment in Fresco took required more time than previously expected. Additional time was then needed to select a team leader and produce the assessment in both English and French.

Lessons learned. The pilot initiative in Fresco is an encouraging step towards future partnerships and efforts to improve existing policies, legislation, and programs. In exploring new options for the implementation of national priorities, the work in Fresco has reinforced mutual support between local and national stakeholders. It can also strengthen coordination between agriculture, forest management, water resources management, mining, urban development on coastal areas, and biodiversity conservation and sustainable use.

There has been progress towards restoring mangroves, but efforts thus far have clearly illustrated that the health of mangroves is contingent on the health of the lagoon and ocean. It is equally critical to address the ecological and socio-economic conditions underlying mangrove restoration. WA BiCC therefore recognizes the importance of applying Ecological Mangrove Rehabilitation (EMR) principles that seek to maintain or reconstruct long-term biophysical and socio-economic conditions for mangroves to grow back naturally. WA BiCC took the appropriate measures to ensure that plantations are established in the right places and with local commitment to maintain and protect planted mangroves. This required preliminary ground verification to ensure necessary conditions are met before planting the seedlings.

WA BiCC recognizes that healthy and productive coastal ecosystems are critical to the long-term strength and resilience of communities, ensuring more sustainable livelihoods and dependable ecological resources for future generations.

6.0 SUMMARY AND CONCLUSIONS

This report sought to assess the state of practice in coastal adaptation projects relative to best practice guidelines, and to identify adaptation projects that may represent models of best practice in different areas. It conducted a desktop review of final and mid-term evaluations of 17 projects spanning Africa, Asia and the Pacific, and Latin America and the Caribbean, evaluating projects against 9 categories of practices and 37 criteria, following The Adaptation Good Practices Checklist.

Project performance on various practices and individual criteria is diverse. No project clearly performed at optimal levels in all practices and criteria. Projects that performed best overall (Haiti and Sao Tome) achieved highest scores in four practices while the majority of the projects (9 projects, including the high performing project in Cuba) achieved highest scores in only 1 or 2 practices. The lowest tier of the projects evaluated (6 projects) did not hit the highest mark in any of the practices. This reflects different project foci and the lack of clear and consistent approach to coastal adaptation and project implementation.

The overall scores and the scores by practice did not depend on the size of the project and its budget with the exception of institutional linkages, where larger projects tended to score higher than the smaller ones. With the caveat of unequal number of projects evaluated in each region, projects in Latin America and the Caribbean tended to perform better on average in most practices while projects in Asia & Pacific were the weakest on average.

To the degree that it is possible to compare the evaluations in the different practices with such different characteristics, a caveat discussed in the methodology section, Sustainability and Risk were addressed the best across the projects while Climate and Participation were least well implemented.

In general criteria related to participatory needs assessment, inclusion/diversity, community engagement and capacity building, feedback loops and flexible planning were least well addressed. Projects that score highest overall or in individual practices integrated these aspects better than the other projects.

The main conclusions by practice are:

- 1. Risk/Vulnerability and capacity** – These criteria were generally well addressed. Projects that performed particularly well in this required implementers to undertake comprehensive assessments to understand the social, ecological, and economic factors underpinning vulnerability. They had a detailed understanding of the needs of different stakeholders before project design even began. Best performing projects in this practice were located in **Cambodia, Guinea, Haiti and Samoa**.
- 2. The participation, inclusion, and gender equality** practice had the most “partially fulfilled” criteria but also a high percentage of projects not addressing them at all. Projects that performed well in this practice devoted time and effort to create highly participatory practices with an explicit gender focus that went beyond the inclusion of women and towards a feminist implementation. In addition, projects designed policies that were pro-poor and considered wealth variations in their target communities, rather than treating the community as a monolithic group. Top-scoring projects in this category were located in **Mexico and Thailand**.
- 3. Climate Information**-related criteria were poorly addressed. This highlights the fact that coastal adaptation projects focused mostly on addressing the adverse effects of climate change impacts and

did not include the reinforcement of climate services or capacity building of communities. Projects that performed well in this practice supported Meteorological Services and provided comprehensive training to build the capacity of local actors for the ongoing creation, interpretation, and dissemination of climate information. Some projects created risk reports that could be sent out to fishermen or farmers in an accessible way. Best performing projects in this practice were located in **Sao Tome and Haiti**.

4. **Planning and decision-making practice** showed a contrasting picture, with some criteria well implemented (appropriate planning level and identification of options) but others remaining poorly addressed (flexible planning and screening processes). Projects that performed well here had flexible plans and budgets that allowed them to adapt to a local and changing context. They often integrated their projects into the national development plans and worked closely with governments at multiple levels. Adaptation options were selected through a clear screening process. The best projects in this practice were located in **Sao Tome and Haiti**.
5. **Innovation, local knowledge, and technology** practice were generally well accounted for, except the use of local and indigenous knowledge and technologies. Projects that performed well implemented traditional forms of knowledge into the design, focusing specifically on innovations that had a good chance of replication and building the capacity for communities to use these technologies equitably in the long term. They also partnered with local universities. Best projects were located in **Thailand and Cuba**.
6. **Adaptive management** had a very split performance between the criteria, with most of the projects failing to include social and environmental safeguards. Projects that performed well here avoided maladaptation by setting clear social and environmental safeguards that were respected in design. They did not predetermine all the activities during preparation, thus allowing for flexibility to adapt to the expressed needs and actual capacities of local communities. Best projects were located in the **Caribbean and Sao Tome**.
7. **Institutional linkages** were in general well incorporated in most of the projects. Projects that performed well created multi-stakeholder forums that included representatives from the public and private sectors, as well as civil society groups and NGOs. They also prioritized inter-ministry cooperation on the multi-sectoral aspects of climate change. Highest scoring projects were located in **Senegal and Haiti**.
8. **Learning, capacity building, knowledge management** criteria had high variability in their performance. While most of the projects did well in the M&E and capacity building the implementation of continuous reflection and feedback loops and related resource allocation were not implemented in most of the projects. Projects that performed well benefited from lessons learned in other relevant projects operating in similar environments and created community-based M&E structures that informed decision-making processes within the projects. Monitoring systems were robust and used for project improvement, rather than simply for reporting. Best performers in this practice were located in **Sao Tome and Tanzania**. The WA BiCC project provides excellent examples of learning that can be applied to policy and practice.
9. **Scaling up and sustainability** practice was in general well addressed, except the cost-benefit analysis, nonexistent in most projects. Projects that performed well in considerations built local capacity and ownership at both local and national levels, including both top-down and bottom-up approaches. They also included a cost-benefit analysis in their project design to ensure project sustainability. **Caribbean, Cuba and Samoa** were the best performers.

This analysis suffers numerous caveats, including the following: limited to desk review; evaluation of end of project or mid-term evaluation reports, not of longer term outcomes; subjective evaluation of criteria that cannot be directly compared. However, it used a comprehensive set of criteria that proved useful in describing project performance and uncover systematic differences between projects. While no project satisfactorily addressed all the criteria certain practices and criteria were well implemented across most of the projects and others were less well implemented in most of the projects. This highlights the fact that certain practices are well internalized in the coastal adaptation projects while others need deliberate and careful integration in the project design phase.

The projects identified by this report as performing best could potentially be used to inform future projects in coastal adaptation, especially in the area of the under-implemented practices.

On another note, it would be interesting to compare the results of this study with results of studies evaluating adaptation projects in other sectors or geographic areas.

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ANNEX I. STATED GOALS OF EACH PROJECT

According to the project documents, the stated goals of each project are as follows:

[Adaptation to Climate Change — Responding to Coastal Climate Change and Its Human Dimensions in West Africa through Integrated Coastal Management](#) (West Africa)

1. To reduce vulnerability and to increase adaptive capacity to the adverse effects of climate change in the focal areas in which the GEF work

[Adaptation to Coastal Erosion in Vulnerable Areas](#) (Senegal):

1. Protect people, houses, cultural and economic infrastructure from the effects of coastal erosion
2. Protect rice culture from salinization
3. Restore cleanliness of coastal areas and waterways
4. Better regulate use of littoral zones incorporating anticipated effects of CC
5. Engage stakeholders in adaptation practices through outreach campaigns

[Climate Change Adaptation Program in the Coastal Zone of Mauritius](#) (Mauritius):

1. To increase climate resilience of communities and livelihoods in coastal areas of Mauritius

[Community Adaptation to Climate Change through Coastal Afforestation in Bangladesh](#) (Bangladesh):

1. Improvement to warning systems for extreme climate events
2. Train national planners and policymakers in climate resilient coastal planning
3. Create land use policies to promote afforestation of coastal regions

[Enhancing Resilience of Coastal Communities in Samoa](#) (Samoa):

1. Strengthen awareness and ownership of coastal adaptation and climate risk reduction processes
2. Increase capacity of coastal communities to adapt to climate related disaster
3. Increase ability of national planners to incorporate climate change-related risk information into planning measures

[Implementation of Pilot Adaptation Measures in Coastal Areas of Dominica, St. Lucia and St. Vincent & the Grenadines](#) (Caribbean):

1. Address impacts of climate change on biodiversity and land degradation
2. Adopt integrated approaches to fisheries management
3. Protect critical infrastructure from storm surge

[Increased Resilience and Adaptation to Adverse Impacts of Climate Change in Guinea's Vulnerable Coastal Zones](#) (Guinea):

1. Improving legal frameworks at national and prefectural levels
2. Increase adaptive capacities of agricultural and fishery productivity
3. Conserve and restore mangrove ecosystems
4. Improve education and communication on climate risks

[Implementation of Concrete Adaptation Measures to Reduce Vulnerability of Livelihoods and Economy in Coastal Tanzania](#) (Tanzania):

1. Reduce the vulnerability of livelihoods, infrastructure, and the economy
2. Develop institutional capacity to manage climate change impacts through improved climate information

[Implementing NAPA Priority Interventions to Build Resilience in the Most Vulnerable Coastal Zones in Djibouti](#) (Djibouti)

1. Address the impacts of climate change on coastal ecosystems and communities by implementing a set of urgent measures that will strengthen the capacity to predict future changes, while helping local populations to adapt through the adoption of more sustainable production methods, particularly in the areas of water management, agriculture, fisheries, and tourism.

[Increasing Resilience of Coastal Areas and Community Settlements to Climate Change in Tuvalu](#) (Tuvalu):

1. Enhance capacity of local administration to plan for and respond to climate risks
2. To improve protections for agriculture
3. To improve water security

[Adaptation to Climate Change Impacts on the Coastal Wetlands in the Gulf of Mexico](#) (Mexico):

1. Create and implement land use plans for protected areas
2. Reforestation of mangrove ecosystems and riparian zones
3. Strengthen local capacity for adaptation through education and dissemination of information
4. Creation of early warning systems
5. Rehabilitation of water fluxes to mangrove zones
6. Establish processes for coordination among agencies in response to natural disasters

[Adaptation in the Coastal Zones of Mozambique](#) (Mozambique):

1. Generate climate change risk and adaptation options analysis and mainstream it into policies, investment plans, and sector budgets at the national and sub-national level
2. Pilot demonstration projects in coastal communities to increase capacity to cope with climate change-induced coastal erosion and to improve coastal ecosystem resilience to climate change
3. Improving knowledge management for replication of climate change adaptation measures in coastal zones

[Reduction of Environmental Vulnerability to Coastal Flooding through Ecosystem Based Adaptation in the Southern Provinces of Artemisa and Mayabeque](#) (Cuba):

1. To increase the resilience of the inhabitants of the coastal municipalities of the provinces of Mayabeque and Artemisa to the effects of climate change

[Adaptation to Climate Change Project: Sao Tome and Principe](#) (Sao Tome and Principe)

1. Deploy coastal early warning system and warning system for those at sea
2. Provide coastal protection for vulnerable communities

[Strengthening the Adaptive Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events](#) (Haiti)

1. Strengthen institutional capacity to plan for and respond to climate-induced impacts in coastal areas
2. Mainstream climate risks management into humanitarian and development investment frameworks
3. Enhance resilience of low-elevation coastal zones to climate change threats
4. Develop models of best practices lessons learned

[Strengthening the Adaptive Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events](#) (Thailand)

1. Increase climate change risk knowledge and awareness
2. Increase capacity for climate change risk management
3. Increase integration of climate change into development practice
4. Disseminate knowledge from project

[Vulnerability assessment and adaptation project for climate change in the coastal zone of Cambodia considering livelihood improvement and ecosystems](#) (Cambodia)

1. To reduce the vulnerability of coastal communities to climate change impacts on agricultural systems and ecosystems within the coastal zone.

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