

FACING EXTREME CLIMATE EVENTS

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THE URGENCY TO ADAPT



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Smarter climate change adaptation strategies for small island states

Guido Corno

Developing countries are vulnerable to extreme weather. Climate change is likely to increase the frequency and magnitude of such devastating events and disasters.



Investments in developing countries are more focused on disaster recovery than on fostering resilience. With extreme weather placing a debt burden on these countries, increased capacity to manage such events can reduce their economic, social and human toll and, over time, lead to less borrowing from lending agencies.

Vulnerability to extreme weather events, disaster management and adaptation must be part of long-term sustainable development planning in developing countries. Lending agencies and donors need to reform their policies to focus more on capacity building instead of just investing in recovery operations and infrastructure development.

The economic costs of extreme weather events are substantial for the developing world. Over the past decade, developing countries absorbed US\$ 35 billion a year in damage from such natural disasters.

On a per capita gross domestic product (GDP) basis, this is 20 times the cost in the developed world (Freeman and Warner, 2001, World Bank Report on GDP Vulnerability to Climate Change).

The magnitude of vulnerability varies according to location, season and exposure of the population and infrastructure. People who live on arid or semi-arid lands, in low-lying coastal or flood-prone areas, as well as on small islands, are particularly at risk. Other factors include economic and social conditions, natural resource capital, political and institutional mechanisms, equity in terms of resource distribution and gender, as well as coping and adaptive capacity.

Disturbing climate data

In the future, a warming climate will influence the normal range of weather patterns for major regions of the globe (IPCC, 2001a).

In the 1990s, both the number and severity of extreme weather events increased. When comparing figures for the 1960s with those of the 1990s, the number of major, weather-related natural catastrophes rose threefold. Economic losses — after being adjusted for inflation — increased by a factor of nine while insured losses grew by a factor of 15 (Munich Re, 1999). These extreme weather events have placed enormous pressure on poor economies, shattered infrastructure and made the poverty-stricken more vulnerable.

Committed to the Caribbean

The Caribbean region has been experiencing an increased frequency of extreme weather events at the rate of 3–4 per year since 2002. These events made change resilience into social and economic plans of vulnerable coastal municipalities. In the Dominican Republic, the GCCA+ aims to increase resiliency include powerful Category 4 and 5 hurricanes. Some of the main environmental, social and economic consequences include enhanced coastal erosion, loss of land and property, dislocation of people, increased risk from storm surges, reduced resilience of coastal ecosystems, saltwater seepage

into freshwater resources, and high costs for adaptation.

The Caribbean islands, like most Small Island Development States (SIDS), are highly vulnerable to the impact of climate change on water supplies, agricultural productivity including exports of cash crops, coastal ecosystems, and tourism as an important source of foreign exchange.

The GCCA+ is committed to addressing the technical and adaptation challenges to extreme weather events in the Caribbean region. In Cuba in particular, the GCCA+ intervention is aimed at strengthening and incorporating mainstreaming disaster risk reduction and climate change resilience into social and economic plans of vulnerable coastal municipalities. In the Dominican Republic, the GCCA+ aims to increase resiliency to severe flooding caused by extreme weather on the northern coast. These planned GCCA+ projects strive to achieve their goals through a nature-based adaptation approach. Such solutions are often more cost-effective in the long-term and can result in important additional socio-economic benefits for the environment, citizens, and the local economy.

"The GCCA+ is committed to addressing the technical and adaptation challenge to extreme events in the Caribbean region."

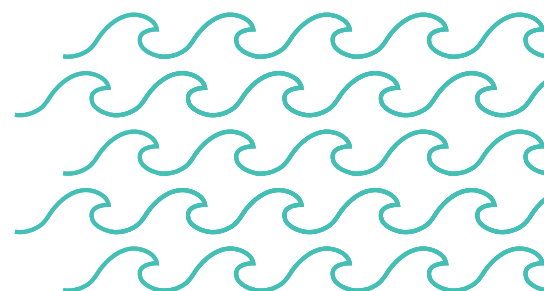
How *vulnerable is your country?*

Developing states are more vulnerable, particularly if their geography – low-lying areas, proximity to the coast or encroaching deserts – increases their exposure to the negative effects of extreme changes in weather patterns.

The open-source and publicly available GCCA+ Index (<https://eu-commission.maps.arcgis.com/apps/MapJournal/index.html?appid=098233335cc548b0bdc339d6532561dc>) allows for an evaluation of key vulnerability features. It is made up of 34 country-specific indicators covering social, economic and environmental aspects that are critical for 'climate-resilient' development.

The GCCA+ index has been developed by the European Commission's Joint Research Centre (JRC).

The higher the score, the more vulnerable the country.
www.gcca.eu



Climate forward

Natural solutions for extreme weather events



Country:

Type:

GCCA Index:

Vulnerability (CRI Index):

Coastal human settlements at risk:

GCCA+ Project:

Cuba

Small Island Developing State (SIDS)

0.31

68th most vulnerable country

119

Increasing coastal resilience



In Cuba, 119 coastal settlements are projected to be at extreme risk from climate change by 2050 while 21 are predicted to disappear altogether by 2100. The most extreme climate change and sea-level rise (SLR) scenarios foresee the flooding of up to 5 696 km², affecting more than 1 million people living in more than 220 settlements.

Climate change presents a multi-sectoral risk to Cuba's society and economy. However, damage to coastal settlements will have a particularly severe impact on women, who are typically the first to relocate in order to ensure adequate living conditions for their families.

The Sabana-Camagüey Archipelago in central Cuba has been hit especially hard by climate change due to more frequent hurricanes and tropical storms making landfall in this area. The archipelago is home to the largest cays system in the Greater Caribbean, making it extremely vulnerable to the projected high SLR (greater than 3 metres) along the coast, as well as increased coastal erosion and exposure to an average of four hurricanes per year.

To address these threats, the GCCA+ aims to increase coastal resilience through nature-based approaches that will offer sustainable solutions to coping with climate change mitigation and adaptation challenges.

The GCCA+ project, in Cuba, will introduce the opportunities, challenges, and success factors of nature-based solutions and present examples of good practice. In the proposed nature-based climate change mitigation, ecosystem services will be used to reduce greenhouse gas emissions and conserve and expand carbon sinks. Nature

Based Solution for Adaptation (NbS) use or mimic natural processes to strengthen adaptation and mitigation to climate change. NbS may involve the conservation or rehabilitation of natural ecosystems and/or the improvement of natural processes in selected ecosystems. Its spatial scope goes from the microscale (building) to the macroscale (ecosystem, municipality). In NbS mitigation, ecosystem services (sustainable land use, forest conservation and reforestation) are used to reduce greenhouse gas emissions and to conserve and expand carbon sinks.

The goal of nature-based climate adaptation is to preserve ecosystem services that are necessary for human resilience to climate change. It also strives to reduce the impact of anticipated negative effects of climate change such as more intense rainfall, as well as more frequent floods, heat waves and droughts.

Both approaches will be adopted by the GCCA+ project, which seeks to increase the resilience of ecosystems and thereby stabilise the provisioning of important services including coastal and flood protection. It will also focus on soil fertility, air quality, carbon storage and the maintenance of beautiful landscapes.

Compared to technology-based solutions to climate challenges, nature-based solutions are often lower cost, longer lasting, and have multiple benefits for a variety of sectors and political goals.

The GCCA+ project in Cuba will showcase the multi-faceted advantages of nature-based solutions and will also explore issues such as project planning and financing.

"The GCCA+ project, in Cuba, will introduce the opportunities, challenges, and success factors of nature-based solutions and present examples of good practice."

Case study

Long-term planning to tackle floods in the Dominican Republic



Country:
Type:
GCCA Index:
Vulnerability:
Population living in vulnerable areas:
GCCA+ Project:

Dominican Republic
Small Island Developing State (SIDS)
69
11th most vulnerable country
96%
Long-term adaptation planning



"The planned GCCA+ project in the Dominican Republic will focus on supporting long-term adaptation planning so as to build long-lasting resilience to extreme weather."

The Dominican Republic, like other Small Island Developing States (SIDS), faces sustainable development challenges including the fragility of its ecosystems and environmental degradation. Exposed to man-made and natural threats, it is both highly vulnerable to climate change and very poor. In fact, with 96 % of its population living in coastal areas prone to cyclones, the Dominican Republic is considered the 11th most vulnerable country in the world on the 2017 Global Climate Risk Index (Maplecroft 2017). Highly dependent on tourism, it is among 20 countries whose economies are most at risk from natural disasters. The Dominican Republic ranks 69th on the GCCA+ Index and the GCCA+ map annexes placed the country with a high percentage of storm frequency, high inequality index (Gini) and also ranked 3th out of 5 in the disaster risk index global report.

The planned GCCA+ project in the Dominican Republic will focus on supporting long-term adaptation planning so as to build long-lasting resilience to extreme weather. In particular, the GCCA+ will establish an integrated climate change adaptation approach for efficient adaptation and Disaster Risk Reduction (DRR) mainstreaming

into national development planning and programming. It is also seeking to enhance the resilience of communities and livelihoods at the national and sub-national level in El Seibo province, which has been greatly impacted by extreme weather events such as droughts and floods. In 2015, a severe drought caused major losses and damage to its agriculture and livestock sectors. Furthermore, Hurricanes Irma and Maria that hit in September 2017 sparked floods and damage to infrastructure. According to the National Meteorological Office (ONAMET), El Seibo was among several provinces that saw the highest rainfall (400 mm) during Hurricane Maria.

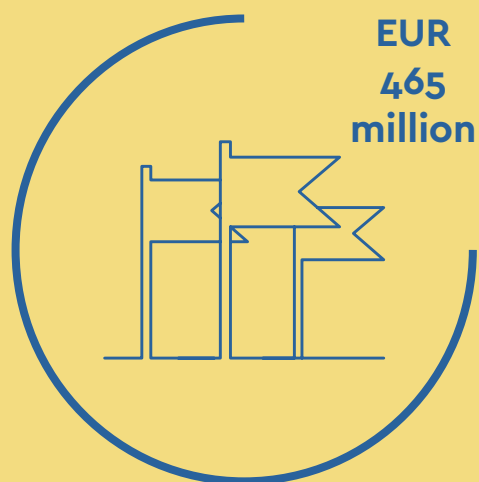
Faced with the prospect of more such devastating floods, the GCCA+ project's long-term adaptation planning will increase resilience and decrease exposure of communities to climate change and natural disasters, by implementing nature based solutions along vulnerable coastlines areas (mangroves restoration/ protection, dunes conservation, coastal zone mapping) and improving a climate and disaster monitoring system. It will involve mapping areas for integrated coastal management, the restoration of degraded watersheds, sustainable agriculture and forest conservation.

THE GCCA+ BAROMETER

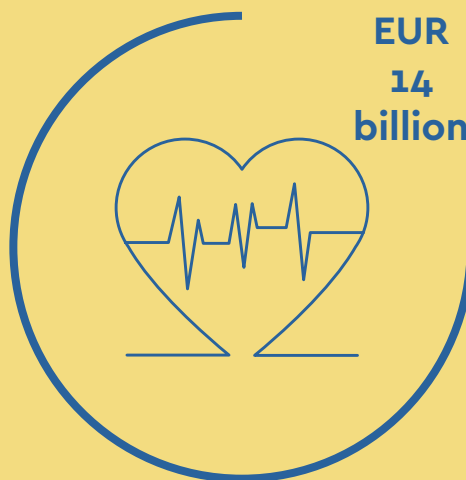
KEY FIGURES ON GCCA+ PROJECTS AND FUNDING



GCCA+ commitments total EUR 750 million for the 2007-2020 period, making it **one of the world's largest climate initiatives.**



Its budget has increased from EUR 285 million for 2007-2013 **to EUR 465 million for 2014-2020.**

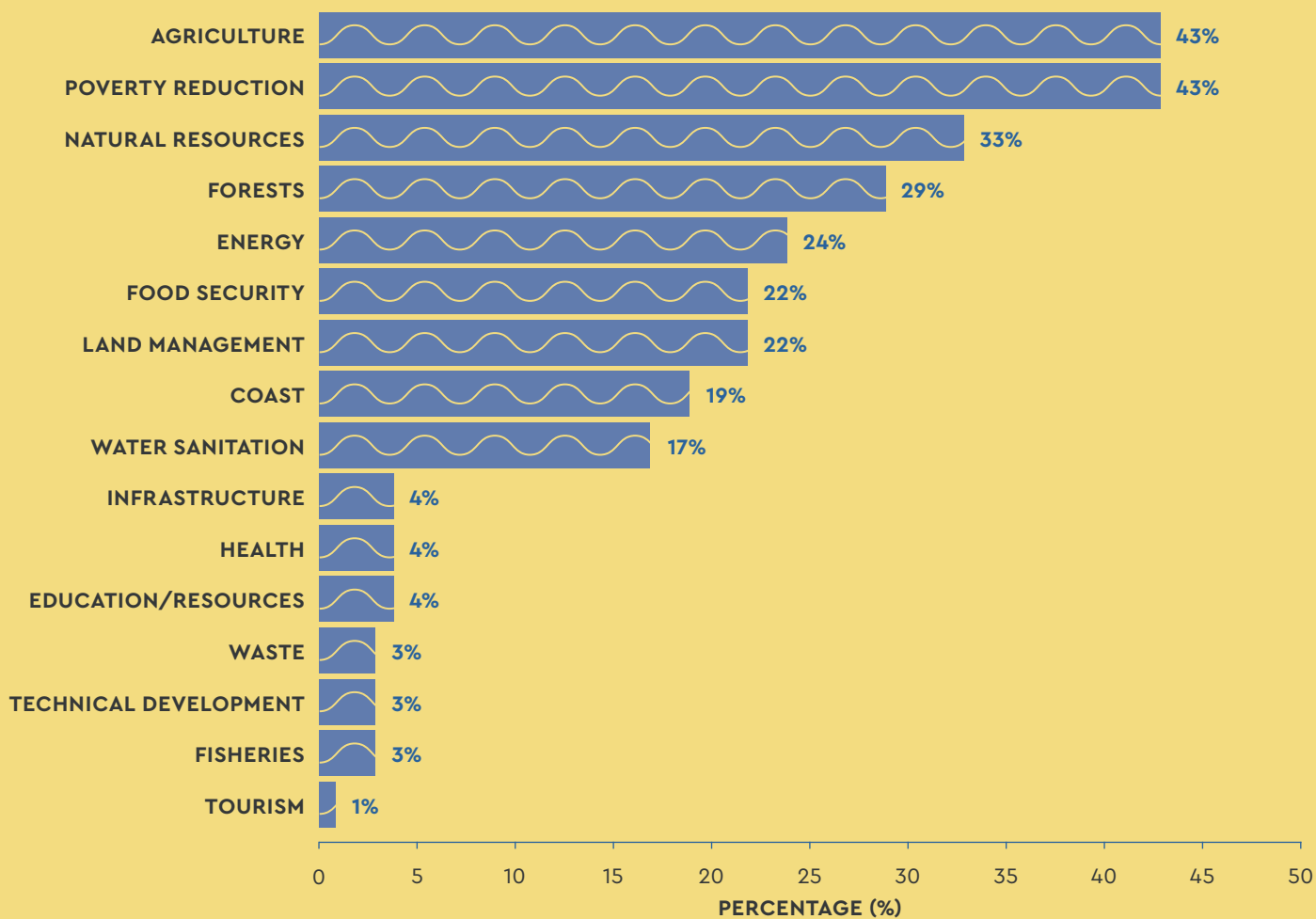


The GCCA+ initiative contributes towards achieving the overall target of **spending at least 20 % – or as much as EUR 14 billion for external action – of the EU budget on climate action by 2020.**

SOURCE: DEVCO GCCA+ initiative, September 2018.

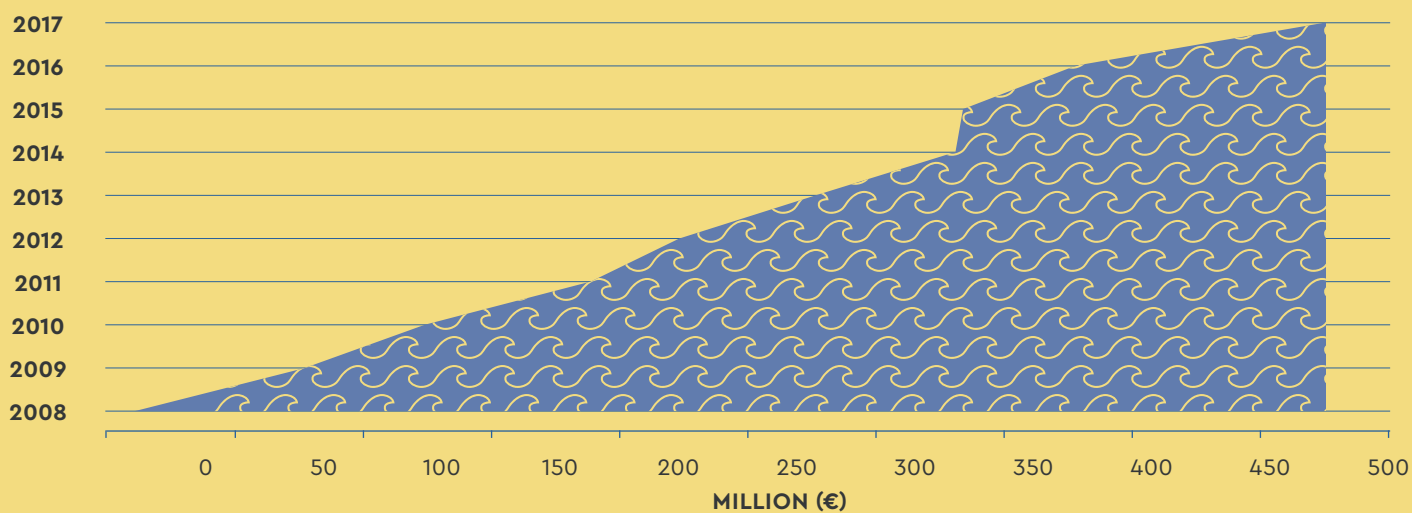
GCCA/GCCA+

Financial support by sectors



GCCA/GCCA+ FUNDING

Cumulative amounts committed 2008-2017



Intra-ACP in focus

The GCCA+ Intra-ACP programme supports members of the African, Caribbean and Pacific Group of States (ACP) in tackling climate change which is challenging their development.



"To date, the project has reached 23 957 final beneficiaries in 33 communities across all four districts in Pemba. 76 % of beneficiaries report a higher income from Community Forests Pemba (CFP) supported interventions."

Pemba Island, or 'The Green Island' in arabic, forms part of the Zanzibar Archipelago, lying within the Swahili Coast in the Indian Ocean. Pemba's unique geography and environment make it vulnerable to climate change which is having a negative impact on traditional livelihoods such as agriculture and fishing. In general, Tanzania's forest areas are under a major threat from deforestation as wood and charcoal account for 93% of the total energy consumed in the country. Deforestation is especially advanced on Pemba Island due to a long history of plantation agriculture and a growing population.

Most of Pemba's population live below five metres in areas connected to the sea. Coastal families began relocating as early as 2013 because of the intrusion of sea water into drinking-water supplies and agricultural land.

Rising temperatures are also causing mortality in coral reefs surrounding Pemba which, combined with overfishing, is undermining the ecological foundations of the island's vital local fisheries.

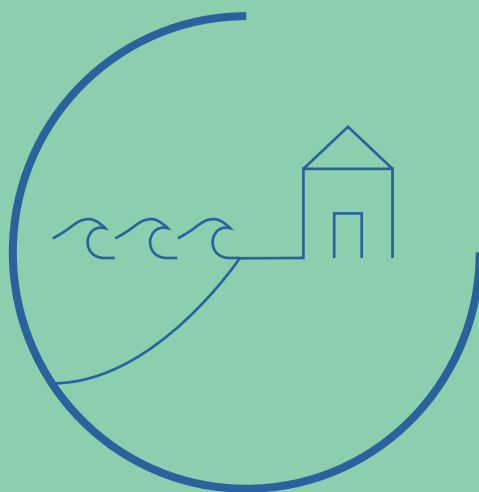
Since 2008, Community Forests Pemba (CFP) has worked with Community Forests International (CFI) to promote community-based solutions to the islanders' problems. With the help of the Intra-ACP Global Climate Change Alliance Plus (Intra-ACP GCCA+) and other contributors, these solutions are being developed and livelihoods restored.

One such response is planting trees. Across Pemba, the CFP has planted trees as part of its climate change adaptation initiatives, which has resulted in ecological restoration and the generation of alternative livelihoods. Since inception, the organisation has grown to support the planting of over 1 million trees.

In 2011, the Intra-ACP GCCA programme (now in its second phase as Intra-ACP GCCA+ since 2017) assisted vulnerable Pemban communities to implement innovative climate change adaptation technologies and low-carbon land-use techniques. The 'Resilient Landscapes for Resilient Communities' project supported the transfer of land ownership from government to communities under secure tenure arrangements; the development of agroforestry and community-based afforestation and reforestation; the implementation of kitchen gardens and resilient agricultural systems supporting diversified fruit, vegetable and nut production; livelihood diversification through activities such as the production of fuel briquettes, fuel-efficient stoves and compressed earth blocks, bee-keeping and composting; investment in rainwater harvesting and seed-storage facilities; and the development of alternative energy systems.

The second phase of the Intra-ACP GCCA+ supports the scaling up of these and more innovative approaches to climate-resilient, sustainable livelihoods across Pemba Island, with specific attention being paid to empowering women.

Pendo Maro



The Best of Practices

Integrated Coastal adaptation

Coastal communities are struggling to become less vulnerable and more resilient in their efforts to adapt to climate change. Coastal adaptation involves anticipating the variety of impacts from increasingly powerful storms and rising sea levels. Such impacts can include flooding, structural damage, erosion, marsh loss, and saltwater intrusion into groundwater. Communities have yet to recover and rebuild from the devastating damage and disruptions caused during the last decade of hurricanes and storms across the Caribbean.

The challenges of adapting to climate change in coastal areas are arising with increasing urgency.

The challenges of adapting to climate change in coastal areas are arising with increasing urgency. Climate change is creating many impacts on coastal and marine systems which can be difficult and complex to understand. Furthermore, they are constantly evolving with growing evidence, knowledge, and understanding that they are linked to trends in the climate and chemical effects of greater greenhouse gas emissions on coastal and ocean systems.

Nowhere will these challenges be greater than in the developing world where often weak institutions and governance systems struggle to deal with mounting pressures from population growth, inadequate infrastructure, and diminishing or already depleted natural resources.

GCCA+ has been collecting good practices for the planning and implementation of Integrated Coastal Zone Management – ICZM- (Bangladesh, Benin, Comoros, Eastern Caribbean, Lesotho, Mauritius, Seychelles and Suriname). These practices apply equally to climate change as they do to other coastal issues. However, some new and important considerations have arisen in the planning and decision-making with respect to adaptation in coastal areas, including:

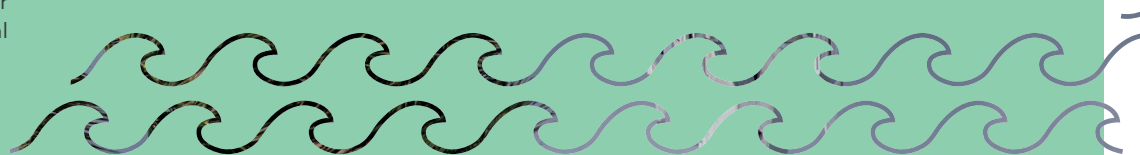
- even more emphasis on nature-based coastal-protection strategies and measures;
- greater uncertainty in decision-making;
- a longer planning horizon; and
- opportunities to mitigate the sources of climate change through adaptation measures.

A fundamental principle underlying the ICZM concept is that decision-making should be based on applying the best information and science available (The

Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) 2006, <http://www.gesamp.org/>). Systematic knowledge and understanding play a major role in guiding the sensible use of coastal resources, resolving human-induced problems and improving governance systems. The GCCA+ has been supporting this integration.

The need for more information in planning and decision-making is becoming increasingly evident for climate change because of the complexity and uncertainty of climate-change impacts. The GCCA+ programme has been applying this framework through its projects, and following the lengthy EU coastal adaptation experience from:

- 1. European Climate Adaptation Platform**
<https://climate-adapt.eea.europa.eu/eu-adaptation-policy/sector-policies/coastal-areas>
- 2. ECONADAPT** is a research project aiming to support adaptation planning by building a knowledge base on the economics of adaptation to climate change and converting this into practical information for decision-makers. <https://econadapt-toolbox.eu/coastal-zones-costs-and-benefits-adaptation>





ABOUT GCCA+

The Global Climate Change Alliance Plus (GCCA+) is a flagship initiative of the European Union helping most vulnerable countries respond to climate change. It started in 2007 and has become a major climate initiative with over 70 programmes in Africa, Asia, the Caribbean and Pacific region.

Join our community

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