



Figure 1 – Vulnerable coastal areas on the island of Mauritius which will require climate change adaptation measures within the next 10-20 years. Project sites marked (Mon Choisy, Quatre Soeurs, Riviere des Galets).

REPUBLIC OF MAURITIUS CASE STUDY

NOVEMBER 2011

CLIMATE CHANGE ADAPTATION PROGRAMME IN THE COASTAL ZONE OF MAURITIUS

Country	Republic of Mauritius (ROM) [http://www.adaptationlearning.net/country-profiles/mu]
Region	Eastern Africa
Key Result Area	Adaptation
Thematic Sector	Coastal Zone Management <i>Key words: coastal zone, storm surges, floods, climate change, adaptive capacity, early warning system, policy</i>
Project Activity Dates	Start: 2012 End: 2015
Key Stakeholders	Mauritian communities in coastal zones with tourism-based livelihoods, specifically in three coastal zones of the island of Mauritius: Mon Choisy, Riviere des Galets and Quatre Soeurs

ABSTRACT

As a Small Island Developing State, the Republic of Mauritius is particularly vulnerable to the adverse effects of climate change, especially in its coastal zones, where a convergence of accelerating sea level rise and increasing frequency and intensity of tropical cyclones results in considerable economic loss, humanitarian stresses, and environmental degradation. In response to these vulnerabilities, the project, Climate Change Adaptation Programme in the Coastal Zone of Mauritius will help coastal communities fight the adverse effects of climate change through the implementation of climate-resilient development measures. Funded by the Adaptation Fund, and implemented by the United Nations Development Programme (UNDP) in partnership with the Government of Mauritius' Ministry of Environment and Sustainable Development, the objective is to increase communal and livelihood climate resilience in coastal areas in Mauritius. This objective will be achieved through a series of initiatives: by applying adaptation measures to protect currently vulnerable coastal ecosystem and community features (at three priority sites on the island of Mauritius); by developing and implementing an early warning system for incoming surges; through trainings promoting compliance with climate-proofed planning, design, and location guidelines; by mainstreaming policies; and finally by disseminating and managing knowledge to ensure benefits that the benefits from the project are replicated in other areas at risk.

BRIEF DESCRIPTION OF ISSUES

Background

The IPCC regional models project increases in mean annual temperature of up to 3.8C by 2100, a declining trend in total annual rainfall but an increase in the frequency of intense rainfall, sea level rise of 18-59 cm by 2100 and an increase in the intensity and rate of intensification of tropical cyclones. Increase in sea temperatures have led to coral bleaching and slower rates of coral growth, which contributes to failure of the wave attenuation function of reefs, leading to beach erosion and storm damage. The natural fragility of the coastline has been compounded with poor design and siting of infrastructure, pollution in the lagoons, historical sand mining in the lagoons and unregulated levels of tourism which further stress beaches, lagoons, sea grass beds and coral reefs.

As of 2010, there were 21 beaches experiencing erosion (23% of the beaches on the island of Mauritius), with accelerated rates in the last 10 years. In addition, there are a further 22 sites on the island of Mauritius that have experienced surges and flooding in the recent past. Each coastal site is unique in terms of driving factors, rate of change and range of technical options. All sites have value to Mauritians as the location for their homes and livelihoods. Due to a combination of topography, a high rate of private land-holdings in the coastal zone, high population density (626 people/km²) and the need for proximity to lagoons to maintain livelihoods, there are few financially viable options to move vulnerable communities in coastal areas to alternative locations. Additionally, there is a lack of technical capacity in Mauritius to deliver practical technical interventions appropriate for each vulnerable site. Standard stop-gap measures (such as sea walls) are the routine approach in most cases of remedial beach work, but they have limited life spans.

BRIEF DESCRIPTION OF PROJECT

Solution: Adaptation Approach, Components and Description

Adaptation requires *in situ* changes in behaviour and site management, and appropriate technical interventions, as well as early warning systems to enable communities to move away from areas where the risk of storm surge and flooding is imminent. As coral reefs lose the race with sea level rise, the critical ecosystem function of wave attenuation must be replaced in some manner. Equally important is the need for a monitoring system that tracks the correlation between key ecosystem functions and weather events to continue to inform and fine-tune the design of appropriate interventions. The programme will implement appropriate coastal protection measures and deliver improvements in the resilience of communities in three coastal zones of the island of Mauritius: Mon Choisy, Riviere des Galets and QuatreSoeurs. The overall approach is to work from the level of technical solutions at specific coastal sites to the policy and regulatory level, such that future replication of coastal adaptation measures will be catalysed, supported by new

policies, guidelines, and economic incentives. Coastal communities will be increasingly climate resilient and able to protect livelihoods that are tied directly to the integrity of the coastal zone on the island of Mauritius.

First, the project will design and construct technical interventions that are site-specific to the three previously mentioned coastal areas, to address climate change issues in a sustainable manner. The idea is to attenuate wave forces in these areas using several different approaches: sloped rock mounds, mangrove planting, repair and re-sloping of seawalls, submerged offshore barriers and drainage schemes. Furthermore, the programme will design and implement a coastal process/weather event monitoring system that will fill the gap in understanding climate change processes in the coastal zone. Second, the project will involve the design, testing and implementation of an early warning system to reduce or prevent the risk of future storm surges for all coastal communities in ROM (Mauritius, Rodrigues, and Agalega).

Third, lessons learnt from other programmes will be compiled and disseminated to specific stakeholders so as to promote best coastal management practices in the region and contribute to limiting communal vulnerabilities linked to climate change effects. Fourth, the project will develop a National Coastal Zone Adaptation Strategy which will address all perceived climate change risks in the coastal zone over the next 20 years, with clear recommendations for appropriate policies, regulations, and guidelines for adaptation. Resulting from this initiative are guidelines on appropriate locations and designs of infrastructure that will reduce the effects of future extreme coastal hazards. Finally, the project will consolidate efforts in disseminating best coastal adaptation practices learnt from the programme towards all coastal stakeholders, practitioners, decision-makers and scientists. Hence, proposed activities will ensure consistent and comprehensive coastal adaptation themes in all training material produced by the programme and delivery of training and public awareness campaigns that are tailored to specific stakeholder groups.

Project Targets

RESULT	TARGET
Objective: Increase climate resilience of communities and livelihoods in coastal areas in Mauritius (all islands)	Provide direct benefits to up to 3,150 people whose jobs, houses, and families are currently threatened by coastal erosion, storm surges, and tidal flooding.
Outcome 1: Current climate change risks at three coastal sites resolved through the design and application of coastal protection measures, using proven technologies (addressing beach erosion and flood risk from storm surges)	By 2014, current climate change risks at three coastal sites (Mon Choisy, Riviere des Galets, QuatreSoeurs) resolved through design and application of coastal protection measures, using proven technologies (addressing beach erosion and flood risk from storm surges). Coastal degradation and vulnerabilities at each of the three sites arrested, meaning: no further erosion at Mon Choisy (beach accretion of 2 metres over 3 years); no surge flooding and no further shore erosion at Riviere des Galets; and, no flooding of coastal public buildings at QuatreSoeurs. The target for numbers of beneficiaries is as follows: Mon Choisy: 1,500-2000 people; Riviere des Galets: 100-150 –people; QuatreSoeurs: 1000 people.
Outcome 2: Early warning on incoming storm communicated to coastal communities, indicating the time of incidence and height of storm surges, through the design and activation of an early warning system	By 2012, more than 3,400 people in current surge zones are able to safely evacuate prior to future storm surge events (there are no people left in the surge zone when the surge hits).
Outcome 3: Increase capacity of public agencies, private sector entities, NGOs and CBOs, and individuals to develop infrastructure and conduct livelihoods in the coastal zone with minimal risk of loss due to future climate change effects.	By 2015, increased capacity of public agencies, private sector entities, and individuals to develop infrastructure and conduct livelihoods in the coastal zone of ROM with minimal risk of loss due to future climate change effects.
Outcome 4: Clear and practical alignment of Mauritanian policy strategies, plans and regulations with the most appropriate best practices for adaptation in the coastal zone, taking into account the expected risks to coastal processes and infrastructure in ROM over the next 50 years.	By 2015, clear and practical alignment of Mauritanian policy, strategies, plans, and regulations with the most appropriate best practices for adaptation in the coastal zone, taking into account the expected risks to coastal processes and infrastructure in ROM over the next 20 years.
Outcome 5: Effective capturing and dissemination of lessons from the applied activities in the programme	By 2015, effective capturing and dissemination of lessons from the applied activities in the programme.

Sustainability

Capacity development is a key feature of the project's approach. Training on coastal adaptation methods will be provided for a wide range and high numbers of stakeholders; specialist certification courses will be developed and run, a national adaptation 20 year strategy developed with recommendations for new policies, regulations, and economic instruments to replicate adaptation in the coastal zone, and climate change mainstreamed into the National Tourism Development plan and District-level Plans. An early warning system for storm surges for the island of Mauritius will alert the authorities in other vulnerability sites of the need for action. Furthermore the local private sector and community-based organisations will be invited to participate in the trainings and planning processes.

Replicability

The project sites are representative in terms of changes in coastal processes due to SLR, storm surge/flooding, and wave incidence; therefore coastal protection measures at the site will have a high degree of replicability. Replication will come about through the implementation of enabling policies and economic instruments and through better capacity of stakeholders to assess the climate change-related problem, identify the adaptation intervention and implement it.

Funding

Adaptation Fund Project Grant: US\$9,119,240

Time Frame

Start of the project: February 2012

Mid-term review: February 2014

Project/Programme closing: February 2016

Terminal Evaluation: November 2015

UNDP-ALM Case Study created: November 2011

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UNDP-ALM Project Website: http://www.adaptationlearning.net/project/af_mauritius

Adaptation Fund: <http://adaptation-fund.org>

