

Country Name	Project for Capacity Development on Coastal Protection and Rehabilitation
Republic of Mauritius	

I. Project Outline

Background	Mauritius is an island country vulnerable to climate change. Coastal erosions became serious problems across the country, which had been caused by various reasons such as accelerating sea level rise, increasing frequency and intensity of tropical cyclones, coral reef damages, tourism development and urban development. Although the Ministry of Environment, Solid Waste Management and Climate Change (MoESWMCC) (former Ministry of Environment and Sustainable Development (MoESD)), local communities, private sectors such as hotel owners and others have implemented physical countermeasures, e.g. constructions of coastal structures, and non-physical countermeasures, e.g. consensus making on removals of coastal structures and reviews of land-use plans, a significant number of locations in the country were still in need of urgent and/or medium- and long-term coastal protection measures. Besides, systematic monitoring and medium- and long-term plans based on a scientific basis were highly required as a coastal protection approach with lesser environmental burden. However, since no engineering expert has been assigned in the Integrated Coastal Zone Management (ICZM) Division in charge of coastal protection, strengthening of expertise and human resource development along with the development of technical guidelines in MoESWMCC was an urgent issue.										
Objectives of the Project	Through preparing a coastal conservation plan, the project aimed at implementation of the coastal conservation plan by the responsible organizations of Mauritius, thereby contributing to coastal protection and rehabilitation. 1. Expected goals through the proposed plan ¹ : The coastal zone of Mauritius is maintained through mitigation of coastal erosion, appropriate coastal spatial management and conservation of reef environment. 2. Expected utilization of the proposed plan: The coastal conservation plan is approved by the government of Mauritius and implemented by the responsible organizations.										
Activities of the Project	1. Project site: Mauritius Island and Rodrigues Island 2. Main activities: 1) basic survey, 2) formulation of coastal conservation plans, 3) implementation of demonstration projects, 4) technical transfer for coastal zone management. 3. Inputs (to carry out above activities) <table><tr><td>Japanese Side</td><td>Mauritian Side</td></tr><tr><td>(1) Mission members: 16 persons</td><td>(1) Staff allocated: 10 persons</td></tr><tr><td>(2) Trainees received: 7 persons</td><td>(2) Facilities and equipment: office</td></tr><tr><td>(3) Equipment: equipment for survey (wave recorder, current meter, GPS, water quality analyzer, GIS software, PC for analysis, etc.)</td><td></td></tr></table>			Japanese Side	Mauritian Side	(1) Mission members: 16 persons	(1) Staff allocated: 10 persons	(2) Trainees received: 7 persons	(2) Facilities and equipment: office	(3) Equipment: equipment for survey (wave recorder, current meter, GPS, water quality analyzer, GIS software, PC for analysis, etc.)	
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Project Period	April 2012 - June 2015	Project Cost	(ex-ante) 440 million yen, (actual) 533 million yen								
Implementing Agency	Ministry of Environment, Solid Waste Management and Climate Change (MoESWMCC) (since November 2019) (former Ministry of Environment and Sustainable Development (MoESD))										
Cooperation Agency in Japan	Kokusai Kogyo Co., Ltd., Nippon Koei Co., Ltd., Central Consultant Inc., Futaba Inc.										

II. Result of the Evaluation

1 Relevance
<p><Consistency with the Development Policy of Mauritius at the Time of Ex-Ante Evaluation and Project Completion></p> <p>The “National Development Strategy” (2005) and the “National Environment Policy” (2007) have placed high priority on the ICZM issues including the preservation of ecological integrity of coastal zones, establishment of lagoon zones, increase in the number of Marine Protected Areas, and others. Under these strategies and policies, the Ministry of Environment and National Development Unit (current MoESWMCC) has issued the “Mauritius Strategy for Implementation National Assessment Report” (2010) and declared to accelerate the formulation of inter-sectoral strategies, policies and guidelines for ICZM. Therefore, the project was consistent with the development policy of Mauritius at the time of ex-ante evaluation and project completion.</p> <p><Consistency with the Development Needs of Mauritius at the Time of Ex-Ante Evaluation and Project Completion></p> <p>Climate change caused sea level rise and sea surface temperature rise which led to coral bleaching, and the situation has been worsened for years. Besides, the coast has been eroded by the development of coastal areas and expected to be accelerated along with the national economic development. Therefore, the project was consistent with the development needs of Mauritius at the time of ex-ante evaluation and project completion.</p> <p><Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation></p> <p>Mauritius is a small island state and vulnerable to climate change and affected by the natural environment. Therefore, the government of Japan continued economic cooperation focusing on environmental countermeasures and climate changes and disaster prevention.² Therefore, the project was consistent with the Japan’s ODA policy for Mauritius at the time of ex-ante evaluation.</p> <p><Evaluation Result></p> <p>In light of the above, the relevance of the project is high.</p>
2 Effectiveness/Impact

¹ The degree of achievement of expected goals is not to be assessed in principle at the time of ex-post evaluation, since it is defined as the medium-to-long-term goals which will be attained as a result of crystallizing the proposed plan (“output” of the project).

² Ministry of Foreign Affairs, “ODA Country Data Book 2012”

<Status of Achievement for the Objectives at the time of Project Completion>

The objectives of the project were achieved by the time of project completion. The affected sites were identified through the baseline survey (Output 1). Based on the data identified, the Coastal Conservation Plans have been formulated (Output 2). The effectiveness of the plans was validated through the demonstration projects implementing physical measures, non-physical measures, and continuous monitoring (Output 3). The technical capacity of the staff of MoESWMCC and other agencies involved has been enhanced through the field survey, monitoring, data analysis, problem analysis, formulation of plans and conducting the demonstration projects (Output 4).

<Utilization Status of the Proposed Plan at the time of Ex-post Evaluation>

The Coastal Conservation Plans prepared by the project have been utilized. The plans were approved by the government of Mauritius in October 2015 (Indicator 1), and various committees including the National Environment Commission³ chaired by the Prime Minister have been following up the implementation of the plans. The plans have been updated not periodically but as needed by the relevant authorities following the progress of the projects recommended by the plans, and the updates have been monitored by the ICZM Committee (Indicator 2). Approximately 80% of the short- and long-term measures recommended by the plans (11 out of 14 projects) are ongoing (Indicator 3). The ICZM Committee has kept coordinating the ICZM activities by various actors including ministries, governmental institutions, local authorities, NGOs, and private sectors (Indicator 4). While the ICZM activities have been properly implemented as a whole, insufficient cleaning of drains and beaches have been issues to be addressed in some areas including Grand Sable and Blue Bay public beach where some drains are partly blocked and beaches get dirty by vegetation and waste.

<Status of Achievement for Expected Goals through the Proposed Plan at the time of Ex-post Evaluation>

The expected goal has been achieved by the time of ex-post evaluation. Beach profiles have been improved by the implementation of the ICZM activities recommended by the Coastal Conservation Plans. The flexible revetment constructed by the project at Grand Sable has been monitored by MoESWMCC after the project, and its effects as a coastal protection and rehabilitation means and environment friendliness was confirmed. Taking these results, the revetment has been extended twice the length and the beach profile there has become further stable. Besides coastal protection measures such as dredging, flexible revetment, sand nourishment, and beach cleaning, facilities for the public and fishers have been rehabilitated including sidewalks, parking lots, mooring spaces and others.

<Other Impacts at the time of Ex-post Evaluation>

Due to the implementation of the demonstration project and the projects recommended by the plans, spaces for recreation for local residents and landing and mooring for fishers' boats have been extended, and infrastructures including roads and houses have been protected. The projects have also promoted the participation of local people in the project meetings and activities such as beach cleaning. No environmental negative impact and complaints from local residents have been reported until the time of ex-post evaluation. Land acquisition and resettlement has never taken place because all lands for the projects were under the jurisdiction of the government.

<Evaluation Result>

In light of the above, the effectiveness/impact of the project is high.

Status of Achievement of Utilization Status of the Proposed Plan and Expected Goals through the Proposed Plan

Aim	Indicators	Results
Utilization Status of the Proposed Plan: The coastal conservation plan is approved by the Government of Mauritius and implemented by the responsible organizations.	Indicator 1: Progress of promulgation and institutionalization of the Coastal Conservation Plans as project plans by MoESD (current MoESWMCC).	(Ex-post Evaluation) Achieved The Coastal Conservation Plans were approved by the government of Mauritius in October 2015. For implementing the plans, various committees have been organized including the National Environment Commission chaired by the Prime Minister at ministry's level, the National Environment Fund (NEF) board meeting chaired by the Ministry of Finance, Economic Planning and Development for funding, NEF roundtable meetings inviting development partners, and the ICZM Committee meetings for specific implementation of the plans. The members of the ICZM Committee are ministries, governmental institutions, NGOs and private sectors.
	Indicator 2: Situation of periodical updating and distribution of the Coastal Conservation Plans.	(Ex-post Evaluation) Achieved The Coastal Conservation Plans have been updated but not periodically. The necessary updates have been made by the relevant authorities following the progress of the projects recommended by the plans. The updates have been monitored by the ICZM Committee. Hardcopies and electronic version of the plans have been distributed widely to the relevant authorities.
	Indicator 3: Progress of implementation of measures presented in the Coastal Conservation Plans.	(Ex-post Evaluation) Achieved Out of 14 short-term measures recommended by the Coastal Conservation Plans, 11 measures have been commenced and none of them has been completed. Out of 14 long-term measures recommended, 12 of them have been commenced and none of them has been completed. Time frames for the short-term and long-term measures were not specifically defined by the Coastal Conservation Plans.
	Indicator 4: Progress of the system formulation for environment conservation at coastal areas (implementation of activities by the cross-sectoral framework, formulation of monitoring system, application of the Technical Guidelines, etc.)	(Ex-post Evaluation) Achieved The ICZM committee has been coordinating the ICZM activities by various actors including ministries, governmental institutions, local authorities, NGOs and private sectors. The technical guidelines prepared by the project have been applied to those activities at various levels from management to construction works.
Expected Goals through the Proposed Plan:	Beach profile after implementation of the measures presented in the Coastal	(Ex-post Evaluation) Achieved Beach profile has been improved by the implementation of ICZM activities

³ The National Environment Commission (NEC) was established under the Section 5 of Environment Protection Act 2002. The commission members are all public departments, local authorities and other governmental organizations for reviewing the progress of environmental management projects and programmes.

The coastal zone of Mauritius is maintained through mitigation of coastal erosion, appropriate coastal spatial management and conservation of reef environment.	Conservation Plans (width and length of sand beach, changes of coastlines, situation of estuary closures, values of public asset conserved (including conserved households, residential areas, public facilities, infrastructures, etc.), changes of awareness of citizens and local communities).	recommended by the Coastal Conservation Plans. The flexible revetment construction done by the project has been extended twice the length by MoESWMCC at Grand Sable after the project, and the beach profile there has become further stable. Besides coastal protection measures such as dredging, flexible revetment, sand nourishment, and beach cleaning, facilities for the public and fishers have been rehabilitated including sidewalks, parking lots, mooring spaces and others.
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Source: MoESWMCC

3 Efficiency

Although the project period was as planned (the ratio against the plan: 100%), the project cost exceeded the plan (the ratio against the plan: 121%). The outputs were produced as planned. Therefore, efficiency of the project was fair.

4 Sustainability

<Policy Aspect>

In 2019, the “Beach Management Plan” and the “National Coastal Zone Adaptation Strategy” were drafted by the Beach Authority and by the initiative of the “Mainstreaming Climate Change Adaptation in the Coastal Zone of the Republic of Mauritius” supported by the Adaptation Fund⁴ respectively and are waiting for the validation by the government of Mauritius. Coastal protection adopting to climate change is highly prioritized in both of these policies.

<Institutional Aspect>

The number of staff of the ICZM Division of MoESWMCC has been decreasing from 7 in 2015 to 5 in 2019 due to the government’s human resource control policy and turnover. The total number of 5 has not been sufficient for the volume of work of ICZM. Responsibilities and mandates of related organizations have been clearly defined and assigned by the ICZM Committee according to the recommendation of the Coastal Conservation Plans prepared by the project.

<Technical Aspect>

Out of the 10 staff members involved in the project as counterparts, 6 of them have left their positions but are still in the Department of Environment of MoESWMCC. Therefore, the knowledge and skills learned in the project have been sustained in the Department of Environment. However, expertise of the ICZM Division has not been adequate particularly on physical oceanography, biological oceanography, hydrodynamic modeling and design of coastal structures. Land/ hydrographic surveyors and divers have been also in short.

<Financial Aspect>

The total amount of budget for the coastal protection activities of MoESWMCC has been stable at around 1,400 million Mauritian Rupee (MUR) though it has been insufficient for the works. Negotiations for external fund from development partners including the Green Climate Fund⁵, the European Union (EU), the United Nations Development Programme (UNDP) and the Agence Française de Développement (AFD) have been moved forward and waiting for the decisions of the partners. Funds from private sectors have also been explored through public private partnership programmes.

<Evaluation Result>

In light of the above, some problems have been observed in terms of the institutional, technical and financial aspects. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The objective of the project was achieved by the time of project completion by preparing the Coastal Conservation Plans. The plans were approved by the government of Mauritius and have been utilized for the ICZM activities including monitoring, construction and cleaning. As for sustainability, there are some problems in the institutional, technical and financial aspects. As for efficiency, the project cost exceeded the plan. Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

- Cleaning is a small but significant work but not necessarily adequately and regularly conducted and caused drains to be blocked and accelerate erosion problems in some areas including Grand Sable and Blue Bay public beach. Since it can also be expected to raise the awareness of local communities on the protection of coasts and natural environment through the participatory approach, it is recommended MoESWMCC and the ICZM Committee to strengthen the coastal cleaning system involving local residents and private sectors.

Lessons Learned for JICA:

- The coastal protection method of flexible revetment has been proven to be an environment friendly appropriate method for coastal protection and rehabilitation through 5 years monitoring of the pilot project after the completion of the project. The flexible revetment enables the ecosystem to regenerate and allows the grasses to grow between the gravels and sand back to the beach. Therefore, it is worthy of consideration to apply the flexible revetment at sites with similar conditions with the pilot site at Grand Sable in Mauritius and in other countries.

⁴ A fund established in 2001 under the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC) to finance projects and programmes in developing countries for adapting to climate change.

⁵ A financial mechanism under UNFCCC which helps fund climate finance investment in low-emission and climate-resilient development in developing countries.



Beach space for local people's recreation, vegetation, parking, and a fence for security created as a part of coastal protection constructions in Grand Sable



Flexible revetment along the coast of Grand Sable keeping a space for fishing activities for fishers