

United Nations Development Programme



Countries: Mauritius and Seychelles

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Resilient nations.

Project title: Restoring Marine Ecosystem Services by Restoring Coral Reefs to Meet a Changing Climate Future	
Countries: Republic of Mauritius and Republic of Seychelles	Implementing Partner: United Nations Development Programme (Mauritius CO)
Management Arrangements: Direct Implementation Modality/DIM (through Mauritius Country Office)	
UNDAF/Country Programme Outcome: <u>Mauritius:</u> Design and implementation of a portfolio of activities and solutions developed at national and subnational levels for sustainable management of natural resources, integration of ecosystem services approaches sound management of chemicals and waste, while ensuring that climate change challenges in terms of adaptation and mitigation are fully addressed. <u>Seychelles:</u> A sustainable Seychelles with enhanced economic growth, income opportunities and social inclusion, supported and promoted b responsive strategies towards poverty reduction and gender equality. Building economic and environmental resilience through the design, implementation and integration of sustainable solutions into development planning processes at national and subnational levels to support the blue economy concept, while ensuring climate change adaptation and mitigation concerns are fully addressed.	
UNDP Strategic Plan Output: Output: 1.3: Solutions developed at national and sub-national levels for sustainable management of natural resources, ecosystem services, chemicals and waste Output 1.4: Scaled up action on climate change adaptation and mitigation across sectors which is funded and implemented. Output 2.5: Legal and regulatory frameworks, policies and institutions enabled to ensure the conservation, sustainable use, and access and benefit sharing of natural resources, biodiversity and ecosystems, in line with international conventions and national legislation.	
UNDP Social and Environmental Screening Category: Low	UNDP Gender Marker: GEN 2
Atlas Project ID/Award ID number: 00119794	Atlas Output ID/Project ID number: 00116171
UNDP-GEF PIMS ID number: 5736	AF Project ID: AFR/MIE/Food/2015/1
Planned start date: 2020 (upon signature)	Planned end date: 2026 (72 months after signature)
LPAC date: Friday 13 December 2019	
Brief project description: Climate change in Mauritius and Seychelles has intensified coral bleaching events and mortality over recent decades. Climate change projections predict that global coral bleaching events will increase in frequency and intensity. Therefore, to reduce the impact of climate change on local communities and coral reef-dependent economic sectors in Mauritius and Seychelles, the proposed project will increase climate resilience at both	



<p>regional and local levels by implementing coral reef restoration with thermal tolerant corals as adaptation to climate change. The proposed project objective will be achieved through the following outcomes. In Mauritius i) development of a sustainable partnership and community based approach to reef restoration, ii) establishment of coral farming and nursery facilities, iii) active restoration of degraded reefs; in Seychelles, iv) development of a sustainable partnership and business approach to reef restoration, v) establishment of coral farming and nursery facilities, vi) active restoration of degraded reefs; in both countries vii) improved understanding and knowledge management of using coral reef restoration as an adaptation to climate change viii) sharing regionally and globally the experienced learned in sustainable coral reef restoration, and ix) training to build capacity for long-term sustainable coral reef restoration</p>		
FINANCING PLAN		
Adaptation Fund (AF)		USD 9,132,420
UNDP TRAC resources		-
Cash co-financing to be administered by UNDP		-
(1) Total Budget administered by UNDP		USD 9,132,420
PARALLEL CO-FINANCING <i>(all other co-financing that is not cash co-financing administered by UNDP)</i>		
	UNDP	-
	Government	-
(2) Total co-financing		-
(3) Grand-Total Project Financing (1) + (2)		USD 9,132,420
SIGNATURES		
Signature: print name below	Agreed by Government of Mauritius	Date/Month/Year:
Signature: print name below	Agreed by Government of Seychelles	Date/Month/Year:
Signature: print name below  Amanda Serumaga	Agreed by Implementing Partner - UNDP	Date/Month/Year: 04-Jun-2020 

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2 LIST OF ABBREVIATIONS AND ACRONYMS

AF	Adaptation Fund	NGO	Non-governmental Organization
AFB	Adaptation Fund Board	NIM	National Implementation
AFD	Agence Francaise du Developpement	NISTI	National Institute of Science, Technology and Innovation
BBMP	Blue Bay Marine Park	NPB	National Project Board
BERI	Blue Economy Research Institute	NPD	National Project Director
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora	NSC	National Steering Committee
COI	Commission de l'Océan Indien	PA	Project Assistant
CORAL	Centre for Ocean Restoration Awareness and Learning	PM	Project Manager
CORDIO	Coastal Oceans Research and Development in Indian Ocean	PMU	Project Management Unit
CPAP	Country Programme Action Plan	POPP	Programme and Operations Policies and Procedures
CSR	Corporate Social Responsibility	PPR	Project Progress Report
CTA	Chief Technical Adviser	ROAR	Results Oriented Annual Report
DSA	Daily subsistence allowance	RPB	Regional Project Board
EIA	Environmental Impact Assessment	RSAC	Regional Scientific Advisory Committee
ERC	Evaluation Resource Center	RSC	Regional Steering Committee
ESMP	Environmental and Social Risk Management Plan	SBAA	Standard Basic Assistance Agreement
EU	European Union	SDG	Sustainable Development Goal
FSP	Full Sized Project	SEMPA	South East Marine Protected Area
GEF	Global Environment Facility	SES	Social and Environmental Standards
ICRS	International Coral Reef Symposium	SESP	Social and Environmental Screening Procedure
IEO	Independent Evaluation Office	SeyCCAT	Seychelles Conservation and Climate Adaptation Trust
KM	Knowledge Management	SGP	Small Grant Programme
M&E	Monitoring and Evaluation	SIDS	Small Island Developing State
MCSS	Marine Conservation Society Seychelles	SNPA	Seychelles National Parks Authority
MEECC	Ministry of Environment, Energy and Climate Change	SSTrC	South-South and Triangular Cooperation
MBEMRFS	Ministry of Blue Economy, Marine Resources, Fisheries and Shipping	ToC	Theory of Change
MOI	Mauritius Oceanography Institute	TOR	Terms of Reference
MoSSNSESD	Ministry of Social Security, National Solidarity, and Environment and Sustainable Development (Environment and Sustainable Development Division)	UNDP	United National Development Programme
MOU	Memorandum of Understanding	UNEP	United Nations Environment Program
MSP	Medium Sized Project	USAID	United States Agency for International Development
		WIO	Western Indian Ocean

3 SITUATION ANALYSIS

3.1 Background

1. Both the Republic of Mauritius (RoM) and the Republic of Seychelles (RoS) are Small Island Developing States (SIDS) in the Western Indian Ocean, located off the eastern coast of Africa.
2. The Republic of Mauritius (RoM) ¹ has an area of 2,040 km², comprising the mainland Mauritius (located 800 km east of Madagascar), Rodrigues Island, Agalega Islands, Tromelin Island, Cargados Carajos Shoals and the Chagos Archipelago. Its Exclusive Economic Zone (EEZ) is nearly 2.3 million km² as well as an Extended Continental Shelf of 396 000 km² managed jointly by RoM and RoS, outside the border of their respective EEZ. Mauritius has a population of 1.26 million, of which around 97% live on the main island and the rest on Rodrigues². Mauritius has 322 km of coastline and 243 km² of lagoon area enclosed by 150 km of fringing reef that surrounds part of the island.
3. The Republic of Seychelles³ is an island archipelago, located some 1,600km east of Kenya, with a total landmass of 455 km², and an Exclusive Economic Zone (EEZ) covering 1.374 million km². The archipelago consists of 115 islands, of which 42 are granitic and the rest are of coralline origin. The main granitic islands, also known as the inner islands, are in descending order of size Mahé, Praslin, Silhouette and La Digue. The granitic islands are within a 56-km radius of the main island of Mahe. Mahe is the largest island with 157 km² and is the site of Victoria, the capital. The coralline islands, rising only a few feet above sea level, are flat with elevated coral reefs at different stages of formation. These islands are largely waterless, and very few have a resident population. The main outer islands are, from north to south, Bird, Denis, the Amirantes group, Alphonse, Coetivy, and the Aldabra, Cosmoledo and Farquhar groups. Almost 50% of Seychelles' land area has been set aside as natural reserves.

3.2 Developmental Challenge

4. Coral reefs are the foundation of food security and coastal livelihoods in both Mauritius and Seychelles. They are the basis of artisanal fisheries and the tourism industry and both are strongly associated with the amount of live hard coral cover.⁴ However, coral reefs are under severe stress. Reefs in the Western Indian Ocean (WIO), as elsewhere in the world, have suffered from a range of negative human-induced impacts but climate-change associated coral bleaching has caused extreme degradation. The WIO was severely affected by the first major global

¹ Republic of Mauritius (2016). *Third National Communication: Report to the United Nations Framework Convention on Climate Change*. Republic of Mauritius, Port Louis. 210 pp.

² Mauritius in Figures 2015. Statistics Mauritius

³ Republic of Seychelles (2011) *Second National Communication Under the United Nations Framework Convention on Climate Change*. Ministry of Home Affairs, Environment, Transport and Energy Government of Seychelles, Victoria. 378 pp.

⁴ Komyakova V, Munday PL, Jones GP (2013) Relative importance of coral cover, habitat complexity and diversity in determining the structure of reef fish communities. *PLoS ONE* 8(12): e83178. doi:10.1371/journal.pone.0083178

Situation Analysis

bleaching episode caused by the 1997/1998 El-Niño/Indian Ocean Dipole event, which resulted in high seawater temperatures. Coral mortality due to bleaching ranged from 10% in Mauritius to 80-95% on the worst affected reefs in the Seychelles⁵, with live coral cover reduced to less than 3% in some areas⁶. While some reefs recovered naturally within 5-10 years, others remained as rubble strewn wastelands even within well-established MPAs, often impacted by other local factors. Further outbreaks of coral bleaching occurred in 2004 and 2009 and although in many sites bleached corals recovered, many others have died⁷. In 2015-2016, the largest and most intense El Niño-coral bleaching event on record occurred worldwide⁸. Preliminary information from Seychelles and Mauritius indicates that reefs in both countries were badly affected, and that the initial recovery from the 1998 mass bleaching was reversed in many locations^{9,10-11}.

5. The frequency of coral bleaching events is predicted to increase in coming decades as seawater temperatures continue to rise. It has been estimated that, by 2100, live coral cover globally could reduce by 30-88% through impacts such as bleaching and reduced calcification in the event of 1.1°C to 2.6°C rise in temperature¹². There are corals that survive bleaching events, and these corals offer an opportunity to restore reefs to maintain ecological function, while the human population drastically reduces burning of fossil fuels¹³.
6. The speed with which climate change is resulting in negative impacts in coral reefs means that conservation alone is not enough to ensure coral reefs remain functional and provide essential ecosystem services to people: food, protection from storms and sea level rise. Active restoration with more thermal tolerant species is needed to ensure coral reefs will remain functional and adapt to climate change.
7. The main development challenge the project seeks to address is to increase climate resilience in Mauritius and Seychelles by implementing coral reef restoration with thermal tolerant corals as adaptation to climate change.
8. The proposed project is fully consistent with the national development policies and associated strategies, programmes of action and other instruments of each country, and well as to relevant regional strategies and agreements (See Part II,

⁵ Obura D (2005) Resilience and climate change: lessons from coral reefs and bleaching in Western Indian Ocean. *Estuarine, Coastal and Shelf Science* 63: 353–601 372.

⁶ Graham NAJ, Wilson SK, Jennings S, Polunin NVC, Bijoux JP, Robinson J (2006) Dynamic fragility of oceanic coral reef ecosystems. *Proc. Nat. Acad. Sci. USA* 103 (22): 8425–8429. doi:10.1073/pnas.0600693103.

⁷ Moothien-Pillay, S., Bacha Gian, S., Bhoyroo, V. and Curpen, S. 2012. Adapting coral culture to climate change: the Mauritian experience. *Western Indian Ocean J. Mar. Sci.* 10(2): 155-167.

⁸ Eakin, CM et al., 2016. Global coral bleaching 2014-2017 – status and appeal for observations. *Reef Encounter* 31(1): 20-26.

⁹ MOI 2016. Presentation by MOI during consultant's mission.

¹⁰ Chong-Seng KM, Graham NAJ, Pratchett MS (2014) Bottlenecks to coral recovery in the Seychelles. *Coral Reefs* 33 (2): 449–461. doi:10.1007/s00338-014-1137-2

¹¹ Harris A, Wilson S, Graham NAJ, Sheppard C (2014) Scleractinian coral communities of the inner Seychelles 10 Years after the 1998 Mortality Event. *Aquatic Conservation* 24 (5): 667–679. doi:10.1002/aqc.2464.

¹² IPCC 2014: Arent et al. 2014: Cross-chapter box on the water–energy–food/feed/fiber nexus as linked to climate change. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.*

¹³ Hughes TP et al (12 authors) (2017). Coral reefs in the Anthropocene. *Nature* 546: 82-90

Situation Analysis

Section E “Consistency with other strategies” of AF Project proposal at Annex U), which all recommend the restoration of coral reef as one of the climate change adaptation measures.

9. The project is also consistent with the following Sustainable Development Goals (SDGs):
 - i. SDG 3 – Good health and wellbeing: Ensure healthy lives and promote wellbeing for all at all ages relating to components 1 and 2 outcome 1.
 - ii. SDG 13 – Climate action: Take urgent action to combat climate change and its impacts; 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; 13.3. Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning; 13.B Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities
 - iii. SDG 14 – Life below water: Conserve and sustainably use the oceans, seas and marine resources for sustainable development; 14.7 - By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism; 14. B. Provide access for small-scale artisanal fishers to marine resources and markets
10. The project will respond to the needs of the more vulnerable groups in each country. In Mauritius 8.5% of the population is below the national poverty line¹⁴. In Seychelles, the poorer groups within the community comprise 39.3% of the population who live under the Basic Needs Poverty Line¹⁵.
11. Many of these groups are the most vulnerable to coastal flooding either because they live on the shoreline or in reclaimed areas of wetlands at risk of flooding or because the structures, they live in are not robust enough to withstand flooding. Infrastructure that is immediately adjacent to the beach is at risk, and there is clear evidence of this in some areas, with seawalls collapsing and erosion of roadbeds, especially after storms. Beaches are critically important as a first line of defence for coastal infrastructure, and the restoration of coral reefs will help to maintain these through the provision of coral sand.
12. Coastal communities will benefit from improved shoreline protection and from the growth of the economy through receiving benefits through remuneration for work done, including tourism and direct employment on restoration initiatives.
13. Both Mauritius and Seychelles have developed national frameworks for climate change mitigation and adaptation responses and have paid increasing attention to the role that coastal ecosystems play in determining the vulnerability of communities to climate change and mitigating its adverse impacts. But, unless further action is taken, barriers remain that will prevent degraded reefs recovering sufficiently to ensure food security and shoreline protection for coastal communities. Despite the current major investments in protecting coral reefs,

¹⁴ <https://www.undp-aap.org/countries/mauritius>

¹⁵ www.nsb.gov.sc National Bureau of Statistics, Seychelles. Poverty Report for the Household Budget Survey 2013

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including the creation and improved management of MPAs and the improved regulation of coastal development, this is still insufficient to maintain the role of coral reefs in food and income security and disaster risk mitigation.

14. The limited experience in and the lack of knowledge on coastal ecosystem restoration in Mauritius and Seychelles and the region hinder the application of ecosystem-based climate change adaptation measures. Lack of knowledge and insufficient awareness of climate change impacts and the urgency of addressing ecosystem restoration and resilience as an adaptation measure are further barriers. Therefore, the main barrier the project is targeting is the lack of standardized technical capacity between Mauritius and Seychelles to implement large-scale coral reef restoration.

4 STRATEGY

4.1 Theory of Change

15. The overall objective is to reduce the impact of climate change on local communities and coral reef-dependent economic sectors in Mauritius and Seychelles by implementing coral reef restoration with thermal tolerant corals as adaptation to climate change.
16. There are three specific objectives, the first two objectives are addressed by each country, and the third objective is regional:
 - i. To improve food security and livelihoods and mitigate disaster risk through active restoration of coral reefs degraded by coral bleaching as a result of climate change in Mauritius, in order to restore their essential ecosystem services.
 - ii. To improve food security and livelihoods and mitigate disaster risk through active restoration of coral reefs degraded by coral bleaching as a result of climate change in Seychelles, in order to restore their essential ecosystem services
 - iii. To generate knowledge and understanding about the use of coral reef restoration as an adaptation measure for dissemination within the two countries, to other SIDS and also countries within the WIO and other regions, and to build capacity for this intervention in the WIO. By adopting a regional approach, it is expected that the stakeholders involved will develop technical and scientific partnerships as well as a common understanding that will enable them to promote the use of effective natural solutions in adaptation and disaster risk reduction.
17. The Theory of Change (ToC) includes two critical development challenges: 1) coral reef habitat destruction and fragmentation due to repeated coral bleaching events and human pressure over recent decades, and 2) lack of awareness of people in Mauritius and Seychelles on the need to conserve and restore coral reefs even when their economies rely heavily on healthy coral reefs through fishing and tourism.
18. The immediate cause for the development challenges is the limited country-wide (in Mauritius and Seychelles) capacity and knowledge on standardized coral reef

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restoration action and techniques. The critical underlying cause is the lack of sustained investments in targeted coral reef restoration strategies. Both immediate and underlying causes generate a barrier to adapt to climate change as there is a lack of regional standardized technical capacity to implement large-scale coral reef restoration with thermal-adapted corals.

19. To reduce the impact of climate change on local communities and coral reef-dependent economic sectors in Mauritius and Seychelles, the proposed project will increase climate resilience at both regional and local level by implementing coral reef restoration with thermal tolerant corals as adaptation to climate change. There are nine expected outcomes, namely, in Mauritius i) development of a sustainable partnership and community based approach to reef restoration, ii) establishment of coral farming and nursery facilities, iii) active restoration of degraded reefs; in Seychelles, iv) development of a sustainable partnership and business approach to reef restoration, v) establishment of coral farming and nursery facilities, vi) active restoration of degraded reefs; in both countries vii) improved understanding and knowledge management of using coral reef restoration as an adaptation to climate change viii) sharing regionally and globally the experienced learned in sustainable coral reef restoration, and ix) training to build capacity for long-term sustainable coral reef restoration.
20. As a result of the outcomes, the expected impacts are three-fold: 1) Full community and business involvement in coral reef restoration, 2) Improved livelihoods with increased fish landings and access to new job opportunities and, 3) A standardized science-based approach and implementation to coral reef restoration in Mauritius, Seychelles and the Western Indian Ocean (WIO) region.
21. The project will be coordinated through the United Nations Development Programme (UNDP) Country Office in Mauritius, which provides UNDP representation for both countries under a single UN leadership with shared programme support services. The project will be implemented over a period of six years (72 months). The project fully involves relevant national institutions as partners both in Mauritius and in Seychelles. They, as Responsible Parties, will take overall responsibility for the project implementation, and the timely and verifiable attainment of project objectives and outcomes. the Responsible Party will be directly responsible to implement the project on site. The Responsible Parties and Activity Partners will report progress to the Project Management Unit and the Project Board (Project Steering Committee). Each of the Responsible Parties will sign a Letter of Agreement with UNDP and each of the Activity Partners will sign an agreement with their respective Responsible Party. A detailed explanation on activities for each institution and how they will be monitored is found in Section 10 Governance and Management Arrangement.
22. The project's selected approach will ensure barriers to climate change adaptation are eliminated by focusing on the region and country-specific needs.
23. A regional approach will be essential, given the comparatively recent development of reef restoration technologies. Sharing experiences and expertise between the two countries will help to accelerate progress. However, it will be important to

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take account of national differences. Research indicates that reefs in the two countries have different susceptibilities to bleaching. Coral reefs in the Seychelles have amongst the highest susceptibilities to bleaching, out of five WIO countries that have been assessed: over 70% of the Seychelles reefs lie in moderate to highly susceptible geographical areas and are exposed to high currents and solar radiation, which makes them more prone to thermal stress. In contrast, susceptibility estimates for coral reefs in Mauritius are low compared to the rest of the region, attributed to the comparatively high temperature fluctuations and wind velocities experienced in this country, with cool periods caused by storms and cloudy periods, a consequence of the country's more southern geographical location.

24. A regional project provides an opportunity to test out different responses to the implementation of coral reef restoration. Country-specific responses will be integrated into the regional approach and the socioeconomic and ecological conditions. Research suggests that although overall the Seychelles has high adaptive capacity, the high susceptibility of its reefs to bleaching means that passive conservation measures may be too slow for reefs to recover before a further damaging event. Therefore, an active and innovative technologically advanced coral reef restoration programme to provide climate change adaptation is appropriate in Seychelles. Mauritius has moderate adaptive capacity which, combined with its low environmental susceptibility to bleaching, means that protectionist conservation policies, such as Marine Protected Areas (MPAs), can be effective coral restoration measures even under the climate change scenario and greater effort should be made to ensure MPAs are implemented. Nevertheless, the current situation is such that more active measures, such as coral restoration, are needed as well, oriented also to helping to improve livelihoods.
25. The project will allow both countries to learn from each other's strengths and weaknesses. Mauritius will develop a more community-based management and low-tech coral reef restoration approach while Seychelles will build on its field experience to date and undertake wider scale, tech-based coral reef restoration that could potentially be mainstreamed into productive sectors. Both countries aim to involve tourism, on an innovative commercial basis.
26. The innovative approach for Mauritius and Seychelles and the WIO region includes: 1) the use of thermal-tolerant coral species in coral reef restoration, 2) Standardized coral reef restoration methods, 3) the community and business Involvement in project activities and, 4) innovation in adaptation finance towards transformational impact, through the identification of mechanisms for sustainable financing of coral restoration.
27. A detailed account of all key assumptions linked to each project component and outcome is shown in Part III, Section E Results Framework Table of the project proposal (Annex U). The internal and external assumptions for the ToC is tabled at Annex Q. A brief description of five core key assumptions follows.

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28. Key Assumptions for internal factors, related to project design and implementation, include:

- Favourable weather conditions (i.e. no El Nino events, no major storms) will allow completion of all in water work and coral response: coral nursery building and transplantation, coral survival and growth, monitoring activities
- Species selection of thermal-tolerant coral species is science-based and suitable for each country
- Survival rate of coral fragments in nurseries and transplanted corals in reefs is similar or better than rates based on previous work done at each country
- The restored reefs will provide ideal habitat to increase fish populations (species, abundance) and other reef-associated species over the project lifetime
- Reports on past and current coral reef restoration projects locally readily available

29. Key assumptions for external factors, related to other partners, stakeholders and context, include:

- Timely delivery and availability of necessary equipment for all project activities
- Low turnover for community members and staff so they are involved until the end of the project
- Coastal communities have successfully completed the training provided and are participating fully throughout the duration of the project
- Capacity of key stakeholders on coral reef restoration techniques, coral genetics analysis and coral reef monitoring is built
- Mauritius and Seychelles economy remains stable and tourism remains at same level or higher, so business plans and sustainable sources of funding beyond the project lifetime are implemented as written

30. Figure 1 summarizes the theory of change of the project, showing the development challenge, immediate cause, underlying cause and the root causes/ barriers, as well as a hierarchy of expected results of the project, from outcomes to overall expected impacts identified in accordance to specific political, regulatory, financial, technical and environmental risks and assumptions

Results and Partnerships

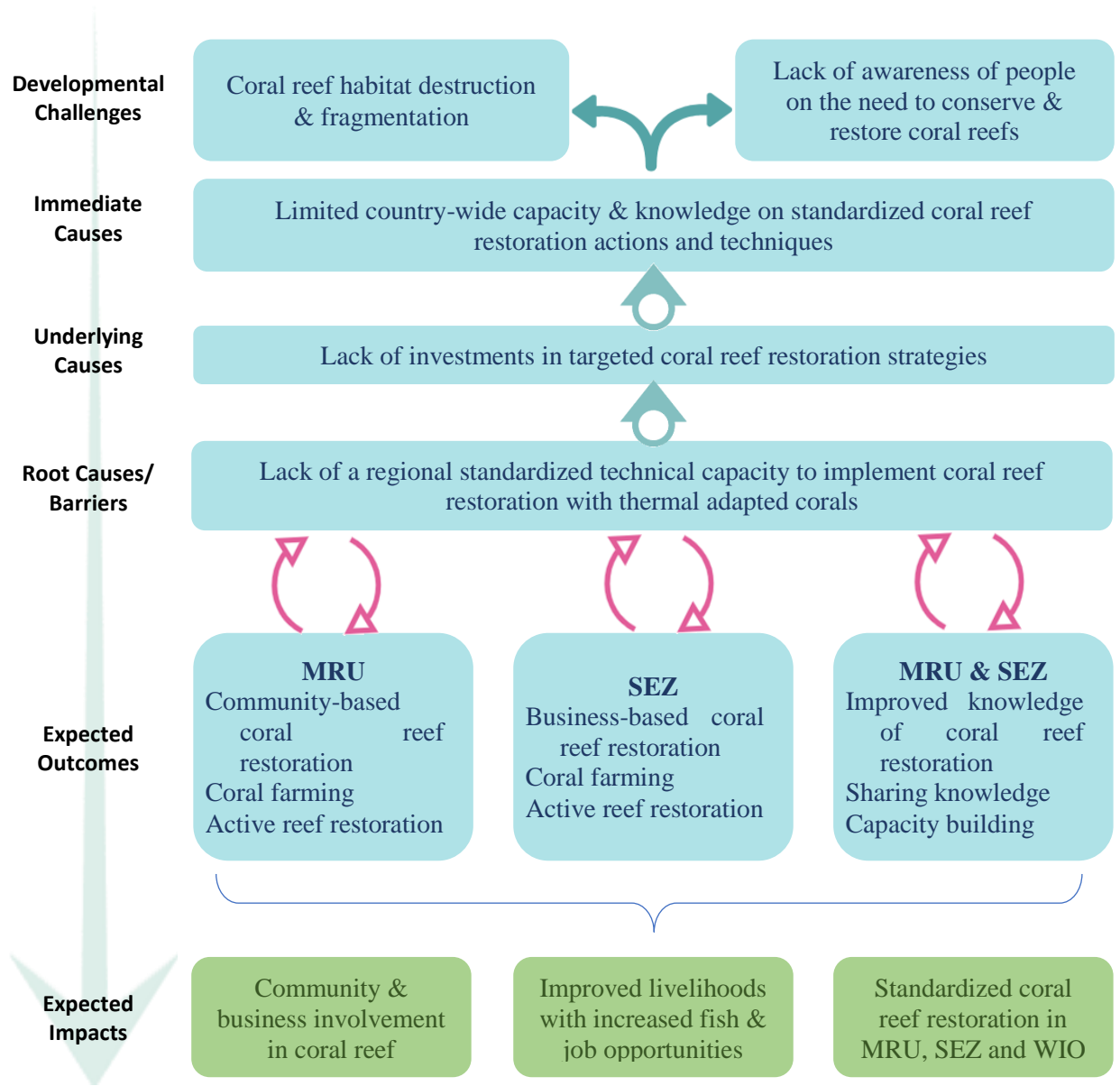


Figure 1 Theory of Change

5 RESULTS AND PARTNERSHIPS

5.1 Expected Results

- This project will provide an opportunity to upscale initiatives already started by the Governments of Mauritius and Seychelles to restore degraded reefs and improve livelihoods for local communities to ensure long-term benefits to their national economies. The project is divided into three components.

Results and Partnerships

- Component 1: Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius
- Component 2: Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Seychelles
- Component 3: Knowledge management and sharing, training and sensitization to build regional capacity for sustainable reef restoration

Component 1: Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius

Outcome 1.1. Improved livelihood for a sustainable partnership and community-based approach to reef restoration

Output 1.1.1. Coastal communities benefit from improved livelihoods through employment establishing and maintaining coral nurseries and transplantation sites.

32. The involvement of coastal communities in establishing and maintaining coral nurseries and transplantation sites can become a new source of revenue for these communities. Such involvement will rely on stakeholders willing to participate in the training required to perform such activities. In Mauritius and Rodrigues, the approach will be to work with small coastal communities and local NGOs, with the involvement of tourism enterprises (hotels, dive centres, boat operators etc.) where appropriate. The technical work will be led by AFRC and MOI (under the aegis of MBEMRFS). The community/NGO will be selected through a call for proposals, with the selection of organizations and communities to take part based on a careful assessment. The interest of coastal communities in coral farming in Mauritius was assessed in 2014¹⁶, and many would be willing to participate. During the preparation phase, as stakeholder analysis and Gender assessment was carried out (see Annexes L, and N). There are also a number of NGOs with relevant experience including Reef Conservation, the Mauritius Marine Conservation Society (MMCS), Eco-Mode, Eco-Sud and, on Rodrigues, possibly TerMer Rodrigues and the Shoals Rodrigues Association. Each of the NGO recruited will also include a project site coordinator and a project site assistant, who will oversee the implementation of the project at restoration site.

Activities include:

1.1.1.1 Stakeholder analysis

1.1.1.2 Training of community members in establishing and maintaining coral nurseries in Mauritius and Rodrigues

1.1.1.3 Awareness campaign on coral restoration in Republic of Mauritius

1.1.1.4 Training of direct beneficiaries in snorkelling and advance PADI or other relevant diving qualification.

Output 1.1.2. Coastal communities benefit from improved livelihoods through increased revenue from alternative work including tourism (glass bottom boat tours, snorkelling and diving trips).

¹⁶ Nazurally, N. and Rinkevich, B. 2014. A Questionnaire-based Consideration of Coral Farming for Coastal Socio-economic Development in Mauritius. *Western Indian Ocean J. Mar. Sci.* 12 (1): 47-56.

Results and Partnerships

33. Restored sites will be located in MPAs and nursery sites can generate new income opportunities for coastal communities by increasing tourist activities. To support the development of a coral reef restoration economic and financial strategy, a report on sustainable financing mechanisms for the maintenance and monitoring of coral restoration work will be completed. This Output requires the development of coral restoration economic and financial strategy for the sustainable financing and maintenance of both the nurseries and the transplantation sites. These strategies will consider the potential sources of funding and what remuneration is needed for labour, as well as the costs of maintenance and monitoring programmes and equipment purchase. The project will provide an opportunity to develop partnerships with the diving and hotel industries and to take advantage of Corporate Social Responsibility (CSR) opportunities to leverage funding. In several countries (such as Maldives and Malaysia) hotels have “adopt-a-reef” programs through which they involve their clients in coral reef conservation activities and also generate new funding opportunities; these activities might provide new funding models for the project. The environmental impact of the revenue generation activities identified will be carefully assessed; for example, it will be important not to promote or encourage collection and sale of wild grown corals. This is also in line with the Mauritian Governmental budgetary measure in 2017 to promote development of alternative livelihood opportunities for coastal communities through coral farming by fishermen and Small and Medium Enterprises (SMEs). In the long run, this budgetary measure is expected to provide a viable source of income for inhabitants along the coastal zone.

Activities include:

- 1.1.2.1 *Development of a coral restoration economic and financial strategy.*
- 1.1.2.2 *Establishing partnership agreement with community groups*
- 1.1.2.3 *Livelihood survey to evaluate impact of project on beneficiaries.*

Outcome 1.2. Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals***Output 1.2.1. Donor coral colonies of appropriate species (resilience, maintaining genetic diversity) available at sufficient scale (quantity, time, intervals etc.) for propagation in nurseries.***

34. This Output includes a technical assessment and selection of coral species for transplantation based on thermal tolerance (survivors of previous coral bleaching events) and genetic analysis of thermal-tolerant *Symbiodinium* clades. Coral reef restoration will be implemented within Marine Protected Areas (MPAs). In Mauritius, the MPAs selected are: Blue Bay Marine Park and in Rodrigues-SEMPA (South East Marine Protected Area). Within the MPAs, nursery sites will be selected based on the reports on coral reef status, water quality, current pattern and key environmental and social parameters. The preliminary locations of the restoration sites are indicated in figures 1 and 2 of Annex R. Surveys will also be completed to identify coral donor sites for locally threatened species in both Mauritius and Rodrigues.

Activities include:

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- 1.2.1.1 *Technical assessment and selection of resilient coral species.*
- 1.2.1.2 *Identification of donor sites*
- 1.2.1.3 *Survey for identification of ocean-based nurseries*

Output 1.2.2. Reports on coral reef status, water quality, and other key environmental and social parameters for potential nursery sites.

- 35. Sea based nurseries will be set up within the MPAs, i.e. BBMP in Mauritius and SEMPA in Rodrigues. These sites will be selected based on the reports on coral reef status, water quality and key environmental and social parameters.

Activities include:

- 1.2.2.1 *Monitoring of sea water quality and other key environmental parameters at donor and nursery sites.*
- 1.2.2.2 *Carrying out the Environmental and Social Impact Monitoring.*

Output 1.2.3. A land-based nursery and 2 or more ocean nurseries established and maintained on a regular basis.

- 36. Mauritius will be using both land-based and ocean nurseries. In Mauritius, building on previous experience, one land-based coral nursery will be built in the premises of MOI. This nursery will be used to propagate locally threatened species and selected massive corals. The land-based nursery will also be used to propagate mother coral colonies so as to minimise collection from donor sites. Additionally, colonies in land-based nurseries are a safeguard to the project, in case of an unexpected severe bleaching event occurs. An experimental land-based set-up will also be used to obtain new coral recruits from collecting coral spawn, that can settle on pre-conditioned plates for a future relocation to the ocean nurseries. The objective of this experimental nursery is to identify the optimal conditions for obtaining recruits on a large scale, for future restoration works nationally.
- 37. Small-scale ocean-based nurseries including table nursery bottom attached model (for culture of up to 100 corals per nursery) (see Annex P) and multi-layered rope nursery (for culture of up to 1000 corals per nursery) will be built for community-based coral farming at each MPA site and additional sites as per interest of adjacent hotels. It is aimed that at least 30% of the communities involved will be women. These ocean nurseries will be filled with nubbins from asexual propagation and eventually will also include nubbins obtained from sexual propagation in the land-based nursery.

Activities include:

- 1.2.3.1 *Setting up of a large-scale land-based nursery at MOI*
- 1.2.3.2 *Setting up, populating and maintenance of 100 table nurseries and 100 multi-layered rope nurseries in BBMP*
- 1.2.3.3 *Setting up, populating and maintenance of 50 table nurseries and 40 multi-layered rope nurseries in SEMPA*

Output 1.2.4. Stock of farmed corals available for transplantation.

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38. Different species of corals will be farmed (see Annex P) and total numbers will depend on sites and nursery method. In Mauritius, the project target is producing 15,000 coral fragments from land-based nursery, 20,000 from the table nurseries, and 100,000 from the multi-layered rope nursery units. In Rodrigues, the target is producing 10,000 nursery-reared corals in table nurseries and 40,000 from the multi-layered rope nursery units. The target is 140,000 farmed coral (75% survival rate) by the end of the project.
39. The nurseries will be set up during the first year and will have a 6 months acclimatization period. The farmed corals will reach the appropriate size for transplantation by the end of the third year.

*Activities include:**1.2.4.1 Collection of coral fragments cultures in land-based nurseries and ocean-based nurseries in Mauritius and Rodrigues*

Outcome 1.3. The health of degraded reefs is restored, through active restoration work, maintenance and monitoring efforts, leading ultimately to greater protection of shore from flooding and storm damage

Output 1.3.1. Rugosity and structure of reefs restored, leading ultimately to greater protection of shore from erosion.

40. Farmed corals will be cemented at sites targeted for restoration within the Blue Bay Marine Park (Mauritius) and SEMPAs (Rodrigues) by the NGOs and the communities. The density of restoration (number of corals per square meters) will depend on the size of corals at transplant time and the status of the degraded reef (See Annex P). It is however estimated that approximately 4 nursery grown corals will be transplanted per square meter. As such it is estimated that approximately 2.5 Ha of coral reef will be restored in Mauritius and approximately 0.7 Ha in Rodrigues. The approximate beach area that is potentially protected is 1.5 Ha and 1 Ha respectively (see figures 1 and 2 of Annex R). Monitoring of the current pattern and coast at the restoration works in Mauritius and Rodrigues will be partly implemented in output 1.3.1 and partly in Component 3.

*Activities include:**1.3.1.1 Transplantation of farmed corals at restoration sites in Mauritius and Rodrigues**1.3.1.2 Part of the spatio-temporal study of the coast and restoration site in Mauritius and Rodrigues.*

Output 1.3.2. Recovery of fish population and other reef associated fauna and flora, leading ultimately to improved food security in Mauritius and Rodrigues.

41. Under this output, standardized long-term monitoring programs will record the effects of the coral reef restoration effort, mainly coral survival, growth rates and abundance and diversity of reef-associated species. It is expected that the restored sites located in MPAs will have an increase in fish biomass and fish species as a result of the coral reef restoration actions. It is foreseen that these reef fish increases will eventually spill over from the MPAs and become available to fishers.

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Nearby control sites will also be selected to scientifically quantify the results of the coral reef restoration efforts

Activities include:

1.3.2.1 Monitoring and maintenance of the restoration sites

1.3.2.2 Monitoring of the restoration site for water quality, live coral cover, fish and other fauna and flora density.

1.3.2.3 Updating the inventory of the corals in Mauritius and updating the booklet describing the corals of Mauritius and Rodrigues.

Component 2: Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Seychelles

Outcome 2.1. Improved livelihood for a sustainable partnership to coral reef restoration

Output 2.1.1. Coastal communities benefit from improved livelihoods through employment establishing and maintaining coral nurseries and transplantation sites.

42. In Seychelles, during the preparation phase, as stakeholder analysis and Gender assessment was carried out (see Annex M and O). there are few local coastal communities and the focus here will be more on NGOs, and the tourism industry. The project will be implemented by SNPA (under the aegis of MEECC), and the two NGOs, Nature Seychelles and Marine Conservation Society of Seychelles (MCSS). Other NGOs with little or no experience in coral reef restoration will participate as part of the capacity building effort. Consideration will be given to involving students from the University of Seychelles as part of their work-study activities, notably the Blue Economy Research Institute (BERI) which was established in 2015 to provide the knowledge and technical input for the development of the Seychelles Blue Economy. The National Institute of Science, Technology and Innovation (NISTI) might also play a role by contributing to the innovative approaches that will be needed to develop coral restoration as a sustainable enterprise.

Activities include:

2.1.1.1 Training of community members in establishing and maintaining coral nurseries

2.1.1.2 Awareness campaign in Seychelles on coral restoration.

2.1.1.3 Scuba training of volunteer students.

Output 2.1.2. Coastal communities benefit from improved livelihoods through increased revenue from alternative work including tourism (glass bottom boat tours, snorkelling and diving trips).

43. In Seychelles, the focus will be on large-scale coral reef restoration. This will be achieved in two steps: updating the strategic plan for the management of MPAs and the development of a business plan. The strategic plan will be upgraded so as to involve the local communities and local businesses that will benefit from the coral restoration works. The plan will consider the potential sources of funding and what remuneration is needed for labour, as well as the costs of maintenance and monitoring programmes and equipment purchase.

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44. Seychelles will also develop a business plan focusing on making long-term, large-scale coral reef restoration financially viable, with several strategies that generate income to be invested again in the coral reef restoration effort:

- Mass-Production and sell of farmed fast-growing corals for reef restoration and for the aquarium trade (CITES compliant)
- Leverage other opportunities in mariculture, notably low trophic level species, with facilities and capacity available
- Attract other marine research & development projects, partners, researchers and students (with facilities and capacity available) to establish platform and knowledge hubs.
- Provide training and boot camp learning programs for national and international trainees in coral mariculture and coral reef restoration.
- Explore science and technology opportunities for uses of farmed corals
- Partner with hotel resorts and other private sector businesses for coral reef restoration using CSR funds

45. The USAID-funded Reef Rescuers project (2011) initiated by Nature Seychelles included research, development, implementation and teaching. Results from this project can be used to reach the next level through the AF project and expand coral propagation and restoration to foster a sustainable coral aquaculture enterprise, which in turn reverts into more resources for coral reef restoration.

46. The mariculture activity will focus on corals and live rock during the AF project, and sponges will be investigated for future implementation. Such activity is tailored to the needs and capabilities of Seychelles as a SIDS¹⁷ (Figure 2). The trade in live corals for aquariums has grown at approximately 9 % per annum since 1990, and on average coral retails at \$56 a piece in the US. Traditionally, the Fiji Islands

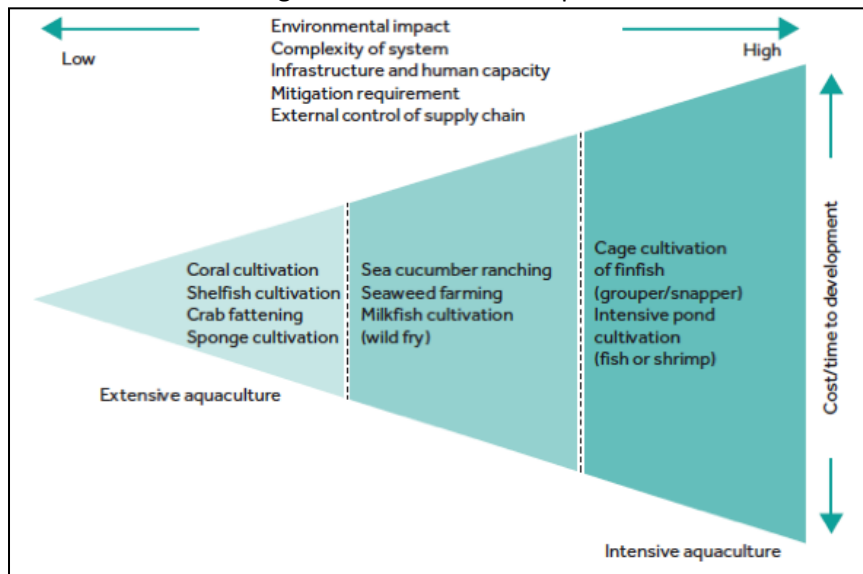


Figure 2 The relationship between the complexity of an aquaculture operation and not it fits into a blue economy framework (adapted from Hughes et al.2016)

¹⁷ Hughes A, Day JG, Greenhill L, Stanley MS (2016). Aquaculture. Commonwealth Blue Economy Series No. 2. Commonwealth Secretariat, London

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47. have been the main source of live rock for import to the US. The value of this trade is \$50 million globally. In the case of sponges, large specimens attract a premium for the bath sponge market, and take approximately two years to grow to market size.
48. The live coral trade will open a potential market for Seychelles maricultured corals. When corals die in the nursery, they can be re-purposed to be sold as live rock, and as part of the development part of the project, sponge species can be tested for mariculture activities
49. Additional income generating opportunities in the Seychelles business plan include:
 - *Use of farmed coral carbonate extractions for the medical/pharmaceutical industry*
 - *New projects with the private sector: Thai Union; COI,*
 - *Upcoming project with a 5-star resort as pilot to test feasibility of using CSR funds for long term restoration*
 - *Potential new call for proposals for AF project in Seychelles, using the Sey Debt-for Adaptation Swap funding mechanism (SeyCCAT), linked to Blue Bonds mechanism*

Activities include:

2.1.2.1 Development of a Business Plan and update of MPA strategic plan.

Outcome 2.2 Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals

Output 2.2.1. Donor coral colonies of appropriate species (resilience, maintaining genetic diversity) available at sufficient scale (quantity, time, intervals etc.) for propagation in nurseries.

50. This output includes a technical assessment and selection of coral species for transplantation based on thermal tolerance (survivors of previous coral bleaching events) and genetic analysis of thermal-tolerant *Symbiodinium* clades. In Seychelles, coral reef restoration and nurseries will be implemented within the MPAs, except for one site (Anse Forbans). The other sites are the Curieuse Marine National Park, Cousin Special Reserve, and Ste Anne Marine National Park. The nursery sites will be selected based on the reports on coral reef status, water quality and key environmental and social parameters. Surveys will also be completed to identify coral donor sites. The preliminary locations of the restoration sites are indicated in figures 3,4 and 5 of Annex R. Surveys will also be completed to identify coral donor sites for locally threatened species.

Activities include:

2.2.1.1 Technical assessment and selection of resilient coral species.

2.2.1.2 Identification of donor sites

2.2.1.3 Survey for identification of sea based nurseries

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Output 2.2.2. Reports on coral reef status, water quality, and other key environmental and social parameters for potential nursery sites.

51. Sea based nurseries will be set up within the MPAs, i.e. Curieuse Marine National Parks, Ste Anne Marine National Parks and Curieuse Special Reserve. The nursery sites will be selected based on the reports on coral reef status, water quality and key environmental and social parameters.

Activities include:

- 2.2.2.1 *Monitoring of sea water quality and other key environmental parameters at donor and nursery sites.*
- 2.2.2.2 *Carrying out the Environmental and Social Impact Monitoring.*

Output 2.2.3. A land-based nursery established, and 2 or more ocean nurseries are established and maintained on a regular basis.

52. A land-based nursery will be set up on Praslin. The land-based nursery will be used to propagate massive corals (micro-fragmentation and fusion) and to obtain new coral recruits from collecting coral spawn that can settle on pre-conditioned plates for a future relocation to the ocean nurseries. The ocean nurseries will be filled with nubbins from asexual propagation and eventually will also include nubbins obtained from sexual propagation in the land-based nursery.

Activities include:

- 2.2.3.1 *Setting up of a land-based nursery on Praslin*
- 2.2.3.2 *Setting up, populating and maintenance of ocean nurseries (midwater rope type); 10 in Cousin Island; 20 in Curieuse Island and 8 in Ste Anne Island.*

Output 2.2.4. Stock of farmed corals available for transplantation.

53. Different species of corals will be farmed (see previous outputs) and total numbers will depend on sites and nursery method. In Seychelles, the project target is producing at least 20,500 coral fragments per year targeting a total of 102,500 corals growing in midwater ocean-based rope nurseries and 1,000 corals growing in the land nursery derived from massive coral micro-fragmentation and asexual reproduction (See Annex P) by the end of the project.

Activities include:

- 2.2.4.1 *Collection of coral fragments cultures in land-based nursery in Praslin and ocean-based nurseries in Ste Anne, Cousin and Curieuse Islands.*

Outcome 2.3 The health of degraded reefs restored, through active restoration work, maintenance and monitoring efforts, leading ultimately to greater protection of shore from flooding and storm damage**Output 2.3.1. Rugosity and structure of reefs restored, leading ultimately to greater protection of shore from erosion.**

54. Farmed corals will be cemented at sites targeted for restoration within the Cousin Island Special Reserve, Curieuse Island Marine National Park, Ste Anne Marine

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National Park and Anse Forbans. The density of restoration (number of corals per square meters) will depend on the size of corals at transplant time and the status of the degraded reef (see Annex P). It is however estimated that approximately 4 nursery grown corals will be transplanted per square meter. As such it is estimated that approximately 1 Ha will be restored at Cousin Island, 1 Ha in Curieuse Island (including St Pierre), 0.25 Ha at Ste Anne and 0.25 Ha at Anse Forbans, which totals to 2.5 Ha for Seychelles. It is estimated that around 200m of beach at Curieuse Island, 500m of Cousin Island, 200m at Ste Anne Island and 600m at Anse Forbans will be potentially protected due to the restoration works, in the long term. Monitoring of the coast and the current pattern will be effected in Component 3.

Activities include:

2.3.1.1 Transplantation of farmed corals at restoration sites in Curieuse Island, Cousin Island, Ste Anne Island and Anse Forbans

Output 2.3.2. Recovery of fish population and other reef associated fauna and flora, leading ultimately to improved food security in Seychelles.

55. Under this output, standardized long-term monitoring programs will record the effects of the coral reef restoration effort, mainly coral survival, growth rates and abundance and diversity of reef-associated species. It is expected that the restored sites located in MPAs will have an increase in fish biomass and fish species as a result of the coral reef restoration actions. It is foreseen that these reef fish increases will eventually spill over from the MPAs and become available to fishers. Nearby control sites will also be selected to scientifically quantify the results of the coral reef restoration efforts.

Activities include:

2.3.2.1 Monitoring and maintenance of the restoration sites

2.3.2.2 Monitoring of the restoration site for water quality, live coral cover, fish and other fauna and flora density.

Component 3: Knowledge management and sharing, training and sensitization to build regional capacity for sustainable reef restoration

56. This component focuses around the need to ensure that experiences built up through Components 1 (Mauritius) and 2 (Seychelles) contribute to the development of a solid base of knowledge on best practices in the use of coral reef restoration as an adaptation measure at both international and regional levels, with particular emphasis on the SIDS. Discussions with stakeholders indicated a need for a better understanding of work undertaken to date in each country, particularly relative strengths and weaknesses of different approaches and their application in different marine environments. The proposed Regional Scientific Advisory Committee (see implementation arrangements) would play an important role in the planning of any research under this component.

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57. The Coastal Oceans Research and Development in Indian Ocean (CORDIO¹⁸) already has an existing and active Coral Specialist Group. This Group consists of international specialists in coral protection and restoration and is also affiliated to the International Union for Conservation of Nature (IUCN). The project will look into the possibility for the Coral Specialist Group to act as the Regional Scientific Advisory Committee. Further, the project will collaborate with CORDIO on knowledge management and sharing at the Indian Ocean level regarding coral restoration efforts as an adaptation mechanism. The project will share its knowledge products widely with other Indian Ocean states, in particular, with SIDS, while the project expects to learn experience of others through the coral specialist group network established by CORDIO.
58. In addition, the project will collaborate closely with the Nairobi Convention and the two regional projects that the Nairobi Convention Secretariat is executing, funded by the Global Environment Facility; namely, UNEP-GEF WIOSAP and UNDP-GEF SAPPHIRE. Both projects are supporting the WIO coastal and island states on their coastal habitat restoration efforts, including coral reefs, though effective management on the ground. Their interventions may form part of the baseline activities for this adaptation project at least indirectly when the knowledge on climate change adaptation through coral restoration generated by this project is shared widely across WIO countries.

Outcome 3.1 Improved understanding and knowledge management of use of reef restoration as an adaptation measure

Output 3.1.1. Comparative review and analysis of coral reef restoration initiatives in the region and globally, with gaps in knowledge identified.

59. A review of coral reef restoration initiatives in the region and globally will be undertaken at the start of the project to identify factors determining success, constraints and obstacles, lessons learned, and cost/benefits of different approaches. Emphasis will be given on assessing applicable methods and experiences in scaling up successful approaches as adaptation measures. Understanding of restoration as a coral reef conservation intervention, and increasingly as an adaptation measure, is evolving rapidly. During the inception phase of the project it will be important to take stock of progress made in order to learn the most recent lessons and adapt the planning for project activities accordingly.

Activities include:

1.1.1.1 Comprehensive review of coral reef restoration in the region and globally.

¹⁸ CORDIO was initiated in 1999 as a response to the El Nino related mass bleaching and mortality of corals in the Indian Ocean in 1998. This non-profit research organisation has supported and collaborated in various coral related project in the eastern Africa, Western Indian Ocean islands (including Mauritius and Seychelles), South Asia, Red Sea and Andaman Sea

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Output 3.1.2. Based on past and ongoing coral reef restorations efforts undertaken by the project and others, science-based best practice and methodologies (e.g. factors determining success in coral restoration are known; cost-effective approaches, etc.) developed, constraints and challenges identified, and lessons learned documented.

60. In this output, a comprehensive review of past and ongoing coral reef restoration efforts will be developed and disseminated, including constraints, challenges and lessons learned.

Activities include:

3.1.2.1 Development and publishing of methodology/guidelines for coral restoration in Mauritius and Seychelles, based on past restoration efforts, best available science and practices.

Output 3.1.3. Research undertaken to provide information to guide restoration and enhance reef resilience where required (e.g. spawning seasons and coral recruitment patterns, resistant/ resilient species and clades)

61. Knowledge gaps in the taxonomy and ecology of corals will be identified and research will be undertaken to fill these, where this is necessary, for successful coral reef restoration (e.g. identification of coral species that are resistant or resilient to bleaching; genetic connectivity of species; spatial and temporal variations in coral spawning and recruitment). It will be useful to develop a better understanding of why adjacent sites may have widely different coral cover and be affected in very different ways by bleaching events.
62. Previous studies¹⁹ on ocean currents and seasonal currents in the Indian Ocean suggest that there is connection between the different islands in the SWIO region. If some coral species are found to be genetically identical, the propagation and maintenance of common coral stocks in both countries could spread the risk during future disturbance events. On the other hand, in case the coral stocks from the different islands are unique, then these stocks should be preserved.
63. In addition to using species already shown to be resilient, further studies will be undertaken (e.g. identification of bleaching-resistant clades of zooxanthellae) to identify other suitable species and strains. This will also enable information on the coral fauna of both countries to be updated and coral distributions mapped. A regional WIO field guide would be a useful output and could contribute to the development of coral reef restoration in other parts of the region. In both countries, the maintenance of coral nurseries will be critical to success and this component will also address the need for rigorous maintenance programmes at each nursery site. Coral nurseries attract biofouling which is a major impediment to the growth of the corals, but research undertaken through the Nature Seychelles project has shown that increased presence of fish, attracted by the nursery, helps to control biofouling and thus can reduce the person-hours needed

¹⁹ Smith WH and Sandwell DT (1997) Global seafloor topography from satellite altimetry and ship depth soundings. *Science* 277: 1957-1962

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for nursery cleaning. Higher abundance of large fish (total number of individuals) resulted in 2.75 times less person-hours spent in nursery cleaning²⁰.

Activities include:

- 3.1.3.1 *Study in genetic connectivity among Mauritius, Rodrigues and Seychelles*
- 3.1.3.2 *Study in the coral spawning and recruits in Mauritius, Rodrigues and Seychelles*
- 3.1.3.3 *Study in the identification of bleaching resistant clades of zooxanthellae.*

Outcome 3.2. Improved understanding within the WIO and globally of successful approaches to reef restoration, the constraints and challenges, with lessons learned incorporated into new initiatives

Output 3.2.1. Lessons learned in coral reef restoration documented and shared

- 64. The lessons learned in each country will be compiled, documented and shared and made available widely, both in the region and globally, and will contribute to the existing documentation on coral reef restoration (e.g. Caribbean restoration manual²¹, World Bank guidance²²; papers presented at 13th International Coral Reef Symposium, ICRS, in 2016).

Activities include:

- 3.2.1.1 *Creation and maintenance of project website*
- 3.2.1.2 *Short clips and documentary film on the project implementation in Mauritius and Seychelles. Same will be used for showcasing the project nationally, regionally and globally.*
- 3.2.1.3 *Participation in relevant international symposium.*

Output 3.2.2. Coral Reef Restoration Tool Kit and manual for use in the WIO, published and disseminated

- 65. During the USAID-funded Reef Rescuers Project, Nature Seychelles produced a Coral Reef Restoration Toolkit²³ for the methodology that it is currently using at Cousin Island. The Toolkit will be updated with guidance for wider applicability in the WIO, including a broader discussion of approaches and methodologies. The updated Coral Reef Restoration Toolkit will be published online, and available to the public.

Activities include:

- 3.2.2.1 *Updating and online publishing of the Coral Reef Restoration Toolkit*

Outcome 3.3. Regional capacity developed for sustainable and climate resilient coral restoration

²⁰ Frias-Torres S, Goehlich H, Reveret C, Montoya-Maya PH. 2015. Mid-water coral nurseries recruit reef fish assemblages in Seychelles, Indian Ocean. *African Journal of Marine Science* 2338:1–6. doi: 10.2989/1814232X.2015.1078259.

²¹ Bowden-Kerby, A. 2014. *Best Practices Manual for Caribbean Acropora Restoration*. Punta Cana Ecological Foundation, 40pp.

²² Edwards AJ (2010) Reef rehabilitation manual. Coral Reef Targeted Research and 530 Capacity Building for Management Program. St Lucia, Australia. ii + 166 pp.

²³ Frias-Torres S, Montoya-Maya PH, Shah N.J (Eds.) 2015. *Coral Reef Restoration Toolkit: A Field-Oriented Guide Developed in the Seychelles Islands*. Nature Seychelles, Mahe, Republic of Seychelles.

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Output 3.3.1. Regional training workshops undertaken on monitoring, DNA-based approach for the identification of resilient corals, and other topics as appropriate

66. Regional technical training workshops, involving individuals from other countries in the Indian Ocean (particularly the SIDS) will be held on a range of relevant topics as determined during the project. Priority will be given to training on methods of coral farming and transplantation, using the experiences and lessons learned gathered in Mauritius and Seychelles. If appropriate, the training programme could be developed in such a way that a Certificate of Competence could be awarded to participants.
67. Mauritius has the institutional capacity to undertake genetic research of coral *Symbiodinium* clades, while currently Seychelles does not – hence the advantage of a regional approach. Seychelles will be involved in this component, providing assistance and building research capacity through knowledge exchange with Mauritius. Moreover, Mauritius will carry out a feasibility study for setting up of genetic laboratories in Seychelles, namely at the Seychelles Fisheries Authority and the University of Seychelles. Until Seychelles sets up its own genetic laboratory, an MOU will be signed between Mauritius and Seychelles so as genetic analysis could be effected by Mauritius for Seychelles at a preferential cost.

Seychelles will provide for a regional training on micro fragmentation and fusion of massive corals to the Mauritian counterpart.

*Activities include:***3.3.1.1 Regional training on genetic/clade analysis**

The scope is to build capacity of stakeholders from Mauritius and Seychelles in carrying out genetic/clade analysis to identify resilient coral species and also the feasibility of sexual propagation of corals in land-based nurseries. A genetic expert will be recruited to assist in the study and build capacity of the Mauritian and Seychelles Stakeholders. The lead government institute will be Mauritius Oceanography Institute (MOI). Beneficiaries will include staff of the Ministry of Blue Economy, Marine Resources, Fisheries and Shipping (MBEMRFS) of Mauritius, the Seychelles National Park Authority (under the Ministry of Environment and Climate Change of Seychelles), Nature Seychelles, MCSS and some participants from the WIO region who are active in coral restoration work in the region.

3.3.1.2 Regional training on coral farming and transplantation

A regional training on coral reef restoration using standardized methodology and lessons learned and best techniques used, to representative of the WIO region countries involved in coral reef restoration. The lead institution will be MBEMRFS in Mauritius

3.3.1.3 Regional training on micro-fragmentation

Building capacity of Mauritian counterparts on proper method of micro-fragmentation. The lead institution is Nature Seychelles.

3.3.1.4 Feasibility study of setting up of genetic laboratory in Seychelles.

MOI will carry out a feasibility study for setting up of genetic laboratories in Seychelles, namely at the Seychelles Fisheries Authority and the University of Seychelles, for capacity transfer.

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Output 3.3.2. Sustainable long-term monitoring programme developed and underway for restored reefs, based on international/regional protocols and best practice

68. Comparative monitoring across both countries will increase knowledge about the effectiveness of the propagation and restoration methods. This will assist in the evaluation of the project. Appropriate indicators must be selected, building on global experience and ensuring that socio-cultural, economic, and governance considerations are included so that the efficacy of coral restoration as a tool to promote coral reef resilience and ensure the sustainable delivery of coral reef ecosystem services is assessed.²⁴
69. Mauritius and Seychelles will develop a Regional Coral Reef Restoration Plan, which will include national components. This Plan will enable both countries (i) to have a long-term National plans for coral reef restoration works for the whole country; (ii) to improve policy, institutional framework and enforcement of coral reef protection in each country and in the region; (iii) set up long-term monitoring of restoration and coral reef ecosystem; (iv) to devise a sustainable financial mechanism to future restoration works; and (v) establish a domestic and regional network and collaboration for regional research, knowledge and expertise exchange, and transfer of knowledge, expertise and equipment (e.g. GIS, drone, ADCP, WTR etc.).
70. The study in current pattern and spatio-temporal study of the coasts in Mauritius and Seychelles will be used as planning tool for the regional coral reef restoration plan. These will enable to identify strategic location for future restoration works, without having negative impacts on the coast. Furthermore, it will also enable to identify location where hybrid reef structures could be used for future coastal protection works and thus enhancing coastal protection.

Activities include:

- 3.3.2.1 Carrying out a spatio-temporal study of the coast at the restoration sites to monitor the long-term impact of the restoration works on the coast.*
- 3.3.2.2 Carrying out the current pattern for Mauritius, Rodrigues and Seychelles, which will be a planning tool to be included in the Regional Coral Reef Restoration Plan.*
- 3.3.2.3 Review the legislative and legal framework of each country*
- 3.3.2.4 Preparation of a Regional Coral Reef Restoration Plan.*

Outcome 3.4. Monitoring and Evaluation

71. The required monitoring and evaluation of the project will be carried out, including conducting annual reviews, and organizing a midterm and terminal evaluation. See Section 11 and table 4 for more details on M&E, including scheduling and allocation of responsibility and budget amounts for specific tasks, reports, and evaluation.

²⁴ Hein, M. Y., Willis, B. L., Birtles, R. A., Beeden, R., 2016. Characterising coral restoration effectiveness: a review of current limitations and challenges at a socio-ecological scale. Paper presented at Int Coral Reef Symp, Hawaii.

5.2 Partnership

72. The **ROM/UNDP/AF “Climate Change Adaptation Programme in the Coastal Zone of Mauritius” project**, implemented by MoSSNSESD, will directly complement the coral restoration project, since it will provide an enabling policy environment for the work to be undertaken. Experience acquired in public awareness to the urgency of climate change and from the reef and seagrass restoration work at Mont Choisy, will be useful for the project.
73. The project will build on and expand existing partnerships between UNDP, MOI and MBEMRFS within the framework of the on-going **UNDP/GEF FSP “Mainstreaming biodiversity into the management of the coastal zone in the Republic of Mauritius”**. This FSP will contribute directly to the passive conservation of coral reefs and will also help to create the environmental conditions that will facilitate the survivorship of transplanted corals.
74. The **AFD “Smart agriculture” project**, which will be implemented by Mauritius Chamber of Commerce and the **EU/GCCA Initiative supporting climate small agricultures for small holders in Mauritius**, will reduce land-based pollution and ultimately improve lagoon water quality, enabling coral restoration to be implemented in the lagoon.
75. Since the restoration sites will be in protected areas, this project will build on and expand existing partnerships between UNDP and the tourism sector within the **GOS/UNDP/GEF “Seychelles – Protected Areas Finance Project** and will be able to build on shared lessons learned and activities related to financially sustainable interventions.
76. The project will also work closely with the **GOS/AF “Ecosystem Based Adaptation to Climate Change”** project and build on experience gained in the reef restoration activity involving a soft-engineering approach at North East Point, Mahe.
77. UNDP will continue to create synergy with SNPA through the **UNEP-EU “Building capacity for coastal ecosystem-based adaptation in SIDS” project**. The efforts in the coral farming at Curieuse Island Marine Park at Praslin will be continued and thus strengthening the climate change resilience and adaptive capacity of Seychelles.
78. Differential survival of coral recruits at different location have been identified under the **GEF SGP – Anba Lao “testing methods of human induced resilience of socio-economically important coral reef sites within the Seychelles Marine National Parks” project**. This knowledge can be used when considering survival of transplanted corals.
79. This project will also work with the SeyCCAT (Seychelles Conservation and Climate Adaptation Trust), for which coral restoration is one of the 8 identified priorities. SeyCCAT aims for a planned addition of 400,000 km² new MPAs in Seychelles.
80. The Marine Spatial Planning (MSP) Initiative is an integrated, multi-sector approach to address climate change adaptation, marine protection and support

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the Blue Economy and other national strategies. It will demarcate areas designated for fishing, tourism and recreation, biodiversity conservation and cultural heritage, and a range of industries, taking into account the need for MPAs. The project will also work closely with the **GOS/GEF The Nature Conservancy and MSP initiative**, regarding the selection of the sites for nurseries and transplantation.

81. The project will benefit from the network established by the **COI / EU regional project “The coastal, marine and island specific biodiversity management in East African and Indian Ocean states.”**, and thus provide a regional framework and long-term monitoring of the restored reef.
82. The project will also benefit from the existing partnership between Nature Seychelles and USAID (United States Agency for International Development) for 2016-2019, to operate the new Centre for Ocean Restoration Awareness and Learning (CORAL) on Praslin Island. CORAL will serve as a national and regional centre of excellence for coral reef conservation and restoration. This is a new phase of funding for Nature Seychelles’ successful Reef Rescuers project.

5.3 Project risks

#	Description	Type	Impact & Probability	Mitigating measures
1.	Loss of government support may result in lack of prioritization of proposed project activities.	Political	It may become more difficult to get the full engagement of higher-level Government staff and politicians, if coral restoration activities appear to constrain development, or has an apparent high cost that is not understood to bring benefits. P =1 I = 4	Regular stakeholder consultation and involvement will be undertaken to ensure that government maintains its commitment and considers the proposed project as a support to its costal protection and coral restoration programmes.
2.	Disagreement amongst stakeholders with regards to demonstration of site selection in Mauritius and Seychelles.	Operational	Discussion about the demonstration site among the stakeholders may become a distraction from the coral reef restoration activities and may cause delay in the implementation. P =1 I = 4	<ul style="list-style-type: none"> • Intervention sites have been selected at the preparation stage. • There will be a participatory approach to the proposed project, particularly with regard to site selection. • The Selected sites need to be reconfirmed at the LPAC²⁵ stage.
3.	Capacity constraints of local institutions may limit the ability to undertake the research and	Institutional	It may be difficult to obtain full engagement of local institution if they feel they do not have the capacity to undertake in research in the domain of coral reef restoration.	Collaboration and exchange between local institutions and Regional research institutes will be initiated and capacity building will be provided by Mauritius to the Seychellois counterparts.

²⁵ Local Project Appraisal Committee

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#	Description	Type	Impact & Probability	Mitigating measures
	interventions in Seychelles		P=1 I=2	
4.	Lack of commitment/buy-in from local communities may result in failure of intervention sites	Operational	It may be difficult to obtain the full engagement of the community if they do not find the change in livelihood beneficial in the long-term. P=3 I=3	Community stakeholders were consulted through a bottom-up approach integrating the community into the proposed project's implementation phases will be followed.
5.	Disagreement among stakeholders with regard to roles in the proposed project.	Institutional	Discussion on the roles and responsibilities about the areas of action of each stakeholder may become a distraction from the implementation of the coral reef restoration activities P=1 I=3	<ul style="list-style-type: none"> Stakeholder roles are detailed clearly in the stakeholder involvement plan, which was developed at project development stage during the consultative processes (2 Regional Steering Committees) in Mauritius and Seychelles (Project Formulation Grant II). This plan will be presented and confirmed during the Inception Workshop
6.	Current climate and seasonal variability and/or hazard events result in poor results for the coral reef restoration.	Environmental	Sever bleaching may occur for long period thus decreasing the success rate of coral survival in the restoration sites. P = 3 I = 5	<ul style="list-style-type: none"> Climate change (bleaching) resilient species will be used as far as possible. Coral colonies will be transplanted of appropriate size to reduce risk of hazard impact from predators. Diversity in transplanted coral colonies will reduce this risk In Seychelles, where it is not frequently affected by cyclones and storms (compared to Mauritius), rope nurseries will be used in nurseries In Mauritius adapted multi-layered rope nurseries and table nurseries will be used.
7.	Delays in fund transfers and procurement of technical services and equipment	Financial	Late funding (slow transfer of funds) or limited absorptive capacity for the programme (UNDP/MBEMRFS/MEECC) may delay some activities, and have a knock-on effect, as outputs from one component are required for the initiation of other components. P = 2 I = 4	<ul style="list-style-type: none"> Project activities have been designed and paced to ensure a reasonable chance of completion over five years (a timeframe less than this would be too ambitious); the PMU will provide required oversight for management of project inputs. Bridging arrangement could be considered between the project and National Institutions in case there are delays.

5.4 Stakeholder engagement

83. Local community members and civil society and NGOs have an important role to play in the sustainability of the project as many are locally based. They know the local fishermen and tourism stakeholders very well and have an on-going coral reef monitoring programme. Stakeholder engagement has been assured through the involvement of different interest groups throughout project preparation. Several stakeholder consultation workshops have been held to present the project and to prepare an action plan for stakeholder engagement in the project.
84. In Mauritius, the Ministry of Blue Economy, Marine Resources, Fisheries and Shipping (comprising of Albion Fisheries Research Centres and the Mauritius Oceanography Institute) will be responsible for the technical expertise, selection of donor corals, and set up of nurseries. Through a Call for Proposals, NGOs will be selected and will be required to implement the community aspect of the project, communicate with and mobilize local stakeholders for the project, and prepare a strategic plan to ensure the long-term restoration activities and follow-up of the nursery and restoration sites. The AFRC and MOI will also provide support to the NGOs and community members to transplant corals to restoration sites and other requirements as needed. Some of the stakeholders identified for this project include: local communities located next to the proposed restoration sites, fishermen and boat operator groups, unemployed youth and women, youth groups, hotels and their representatives, local conservation and environmental NGOs, University students and researchers.
85. In Seychelles, the Ministry of Environment, Energy and Climate Change will be the Responsible Party and responsible for the overall implementation of the project. The SNPA, Nature Seychelles and MCSS (activity partners) will be responsible for the implementation of the project activities on site and to ensure proper communication and engagement of the local communities. The activity partners will be accountable to MEECC for the implementation of project activities. A business plan will be prepared and the activity partners and will work in collaboration with diving centres, boat operators, hotels, students, volunteers, and any local communities. The other key stakeholders in Seychelles include other environmental NGOs and Civil Society Organisations, Women's groups, Environmental Youth Groups, Coastal Community Groups (e.g. Anse Forbans), Artisanal Fishermen, etc.
86. A list of stakeholders and their role in project and in the implementation of the Environment and Social Risk Management Plan (ESMP) has been described in Annex E.
87. A full stakeholder analysis and engagement plan for Mauritius and Seychelles are available in Annexes L and M.
88. The proposed project will utilize the existing UNDP grievance mechanism to allow the affected to raise concerns that the proposed project is not complying with its social or environmental policies or commitments. It will be the responsibility of the PMU and National Project Teams to ensure that all relevant stakeholders are

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adequately informed of the grievance mechanism. The Grievance mechanism is described in Annex J.

5.5 Mainstreaming gender

89. Gender equity and women's empowerment has been considered from the early project development phases, with the development of the Gender and Youth Assessment for each country outlining the baseline context, challenges, potential climate change implications, and the Gender and Youth Action Plan (Annexes N and O).
90. In Mauritius, men and women enjoy the same legal status and rights under the constitution and law. The courts uphold these rights. Nonetheless, cultural and societal barriers prevented women from fully exercising their legal rights. The Ministry of Gender Equality, Child Development, and Family Welfare has a mandate to promote the rights of women. The National Women Entrepreneur Council, operating under the ministry, is a semiautonomous government body established to promote the economic empowerment of women. Women have equal access to credit and can own or manage businesses²⁶.
91. In Seychelles, the law provides for the same legal status and rights for women as for men, and the society is largely matriarchal.²⁷ There was no officially sanctioned discrimination in employment, and women were well represented in both the public and private sectors. There is no economic discrimination against women in employment, access to credit, equal pay for equal work, or owning or managing a business. Inheritance laws do not discriminate against women.
92. In both countries, boys and girls have access to free primary and secondary level education. Literacy rates and school enrolment rates are high for both boys and girls. While boys and girls are subject to equal education opportunities, some stereotypical divides are observed in the subjects they major at the tertiary education level.
93. Employment opportunities are still better for men than for women, especially at the managerial level jobs and jobs with higher wages. It is observed in both countries that members of female-headed households yearn less with less opportunities for various factors.
94. Both female and youth representation in the decision-making are limited, and voice of women and/or youth are not organized well enough to be heard at the political arena. With support from women organization and youth organization, positions of women and youth should be further strengthened, and their voice be heard.
95. The proposed project interventions will not pose any risks related to gender equity and gender (and youth) empowerment. Rather, the project is designed so that its implementation will contribute to the empowerment of women and youth in

²⁶ Mauritius (2016) Human Right Report

²⁷ Seychelles (2016) Human Right Report

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economic activities, through improved livelihoods, and active participation in technical activities and scientific researches related to coral restoration efforts, contributing to the reduction of the gender stereotyping in professions. A number of indicators included in the Results Framework are designed specifically to realize these benefits related to women and youth empowerment.

96. Equal participation of men and women in decision-making forums as well as capacity building activities will be sought. In Mauritius, women from coastal communities have expressed an interest in supporting awareness raising activities and want to be a part of local decision-making forums. In addition, fisherwomen as well as women who have strong swimming and underwater skills in Rodrigues and the South of Mauritius will have an opportunity to participate in coral reef restoration training and implementation. The project will also give particular attention to capacity building of female scientists.
97. Project Gender Officer(s) will be recruited to monitor progress in implementation of the project Gender Action Plans and to ensure the intended gender and youth empowerment results will be achieved through the project implementation.

5.6 South-South and Triangular Cooperation (SSTrC)

98. The project will directly support SSTrC through three cooperation modalities: (i) bi-lateral knowledge exchange and exploration of technology transfer with other UNDP – AF/GEF projects in the region; (ii) cooperation with and contribution to other UNDP project and initiatives in SIDS and developing countries including sharing project successes and lessons learned; and (iii) contribution to and learning from information exchange platforms that promote sharing of results and lessons learned between the two implementing countries, the region, and with the GEF/AF community and beyond.
99. Already the project has benefited from SSTrC as the project will use knowledge gained from past coral reef restoration experience: the implementation of the UNEP-EU funded project (Building capacity for coastal ecosystem-based adaptation in SIDS) in Seychelles and the production of a Coral Reef Restoration Toolkit from the USAID funded Reef Rescuers project, also in Seychelles.
100. The project will facilitate exchange of experience and lessons learned from coral reef restoration between Mauritius and Seychelles, the West Indian Ocean Region and internationally. The project will disseminate results using existing information sharing networks and forums of relevant focus.

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6.1 Cost efficiency and effectiveness

101. The project is designed to up-scale coral reef restoration using best practices and to build national and regional capacity for using this adaptation measure more widely to reverse the trend of rapid decline in reef health and thus ultimately improve shore protection and food security ecosystem services that coral reefs provide. Ecosystem restoration is increasingly recognised as being a more cost-

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effective approach to building long-term adaptation to climate change impacts, than developing hard engineering and expensive technological solutions. Therefore, the proposed project is considered as a key catalytic investment in climate change adaptation.

102. The cost of coral reef restoration varies significantly according to method, objective and location, as does the cost effectiveness of the methods used, but as the number of initiatives increase and further research is undertaken, costs are reducing as greater experience is gathered. Preliminary costs of restoration have been assessed in Mauritius (USD100/m² rehabilitated reef; USD565/nursery unit)²⁸ and Seychelles (approx. USD153/ m²)²⁹ based on work to date, but these figures are not directly comparable as they have been estimated in different ways. Nevertheless, they are broadly comparable with estimates obtained from meta-analyses of studies which have resulted in costs of about USD115/m² according to one study of 52 coastal restoration efforts³⁰. A more detailed study of 71 coral reef restoration efforts³¹ is also available which provides a range of estimates for different situations.
103. The cost of global coral reef restoration is only a fraction of the annual revenue generated by coral reefs. The value of coral reefs globally ranges from US \$ 30 Billion/year to \$ 375 Billion/year. The costs of restoring coral reefs globally range from US \$ 1.2 Billion/year to US \$ 22.5 Billion/year. Variations in value and costs depend on how the calculations are done. Therefore, at the lowest estimate, the value vs. cost ratio between value of coral reefs and cost of restoration is 4% and the highest 6 %. Meaning, only 4 -6 % of the value globally generated by coral reefs every year is needed to restore these valuable ecosystems³².

²⁸ MOI 2016. Pers.com. Presentation

²⁹ Montoya-Mya, P. 2016. Pers.com (webinar)

³⁰ Narayan S, Beck MW, Reguero BG, Losada IJ, van Wesenbeeck B, Pontee N, et al. (2016) The Effectiveness, Costs and Coastal Protection Benefits of Natural and Nature-Based Defences. PLoS ONE 11(5): e0154735. doi:10.1371/journal.pone.0154735

³¹ Bayraktarov E, Saunders MI, Abdullah S, Mills M, Behr J, Possingham HP, Mumby PJ & Lovelock CE 2016 The cost and feasibility of marine coastal restoration. *Ecological Applications*, 26(4): 1055–1074

³² Montoya-Maya PH, Frias-Torres S. 2016. Reef restoration meets reef conservation: proposing coral gardening as a MPA management tool. 4th International Marine Conservation Congress, 30 July–3 August 2016, St. John's, Newfoundland and Labrador, Canada.

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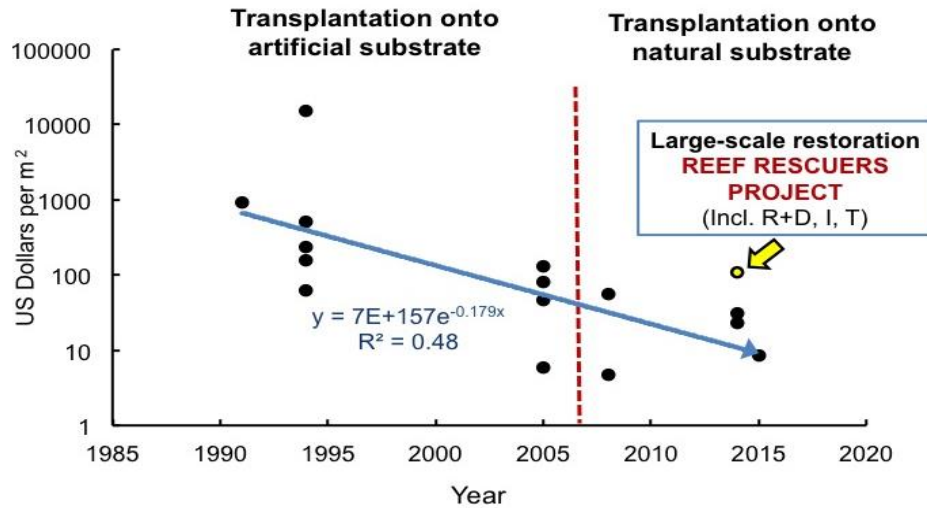


Figure 3 Costs of restoring one square meter of reef from 1990 to 2015.

The cost of coral reef restoration has been decreasing steadily since 1990. The USAID-funded Reef Rescuers project implemented in Seychelles included research, development, implementation and training, not just restoration, hence the price per square meter was higher than other restoration only projects. The Y-axis is in year 2012 Unit costs. Cost estimates from Ferse et al (2008), Ferrario et al (2014), Mbijje et al (2013), Guest et al (2014), Horoszowski-Fridman et al (2015). Modified from Montoya-Maya & Frias-Torres (2016) Reef restoration meets reef conservation: proposing coral gardening as an MPA management tool, IMCC 2016.

104. The cost of restoring one square meter of coral reef has been steadily decreasing since 1990 (Figure. 3).
105. Artificial approaches are more costly in the long term, requiring the installation of shoreline defences, and the development of more costly alternative food sources for coastal communities, such as offshore fisheries or mariculture. A meta-analysis³³ of the costs of coral reef restoration versus construction of artificial defences found that the former was significantly less than the costs of building breakwaters. Cost-effectiveness of coral reefs for coastal defence was higher than artificial systems when maintenance costs for breakwaters was compared to the benefits of coral reefs in terms of fisheries, recreation and economic values of ecosystem goods and services. In addressing coastal erosion and flooding, structural engineering options include artificial barriers constructed to diminish wave action out at sea, barriers on the beach and groynes out to sea. However, these measures are costly – for a 500 m stretch of coast the cost of seawall construction can be USD40,000 – 80,000, plus annual maintenance costs. Further, tourism is dependent on natural beauty and aesthetic values, which such artificial barriers will affect adversely, whereas careful science-based coral reef restoration adds attraction for divers and snorkelers.
106. Coastal protection using artificial hardening structures is perceived as an immediate solution to coastal erosion problems. However, in the long term, living

³³ Ferrario F, Beck MW, Storlazzi CD, Micheli F, Shepard CC, Airoidi L. 2014. The effectiveness of coral reefs for coastal hazard risk reduction and adaptation. Nature Communications 5.

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shorelines (restoring wetlands, mangroves, coral reefs, etc.) outperform grey infrastructure (artificial hardening). The most comprehensive literature review contrasting living shoreline restoration with artificial hardening concluded that natural alternatives, such as living or nature based shore protection or biogenic habitat restoration, can reduce erosion while also enhancing other ecosystem services³⁴ (Gittman et al. 2016); the superiority of nature-based shore protection over artificial hardening has been shown restoring oyster reefs on intertidal marshes (Meyer et al 1997³⁵; Scyphers et al. 2011³⁶), natural marshes in estuarine shorelines (Gittman et al 2014³⁷), and in 89 restoration assessments in a wide range of ecosystem types across the globe where ecological restoration increased provision of biodiversity and ecosystem services by 25% to 44 % (Benayas et al. 2009³⁸).

107. For the specific case of Mauritius and Seychelles, the availability of hard substrate (carbonate rock, granite) is not a limiting factor for new coral recruitment. However, coral reefs have reached such a state of degradation that human intervention is needed in the form of coral reef restoration, so coral reefs continue to provide shoreline protection and other ecosystem services to people.
108. Several coast protection initiatives have been carried out in Mauritius (parapet wall, rock revetment) and Seychelles (retaining walls, rock armouring, groyne and timber piling). It is estimated that the cost of rehabilitating 1km of coastal line in Mauritius using hard structures (rock revetment, parapet walls, etc) will be approximately USD 2 million. In Seychelles the cost for rehabilitating 1.5 km of coast using hard structure will range from USD 2.5 million to USD 5.7 million. Mauritius is presently testing the use of reef balls to protect a northern coast in Mauritius using 900,000 concrete reef balls (hybrid measure) over approximately 0.4 Ha, which cost some USD 2.5 million. Therefore, if hybrid measures were to be used to cover the targeted 3.2 Ha in Mauritius and 2.5 Ha in Seychelles, will cost approximately USD 20 million and USD 15.6 million, respectively.
109. The activities under the project will not be solely coral restoration, it will also be adopting a community-based strategy for coral restoration. Communities (will be sensitised on the importance of coral reefs as a habitat for fish and understanding that the destruction of corals can contribute in the longer-term loss of fisheries productivity. This will develop a community stewardship for the protection of the coral reefs. Communities will also be trained in the coral reef restoration

³⁴ Gittman RK, Scyphers SB, Smith CS, Neylan IP, Grabowski JH (2016) Ecological Consequences of Shoreline Hardening: A MetaAnalysis. *BioScience* 66: 763773

³⁵ Meyer DL, Townsend EC, Thayer GW. 1997. Stabilization and erosion control value of oyster cultch for intertidal marsh. *Restoration Ecology* 5: 93–99.

³⁶ Scyphers SB, Powers SP, Heck KL Jr., Byron D. 2011. Oyster reefs as natural breakwaters mitigate shoreline loss and facilitate fisheries. *PLOS ONE* 6 (art. e22396).

³⁷ Gittman RK, Popowich AM, Bruno JF, Peterson CH. 2014. Marshes with and without sills protect estuarine shorelines from erosion better than bulkheads during a category 1 hurricane. *Ocean and Coastal Management* 102: 94–102

³⁸ Benayas JMR, Newton AC, Diaz A, Bullock JM. 2009. Enhancement of biodiversity and ecosystem services by ecological restoration: A meta- analysis. *Science* 325: 1121–1124

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techniques. With the assistance of the Government initiative alternative, livelihood to coastal communities will be promoted.

110. The project will invest in long term planning and monitoring of coral reef in both countries. Through the project, a baseline data on spatio-temporal study of the coast dynamics and the current wave pattern would be effected. This will be used as a planning tool for the strategic positioning and planning of future restoration works in both countries, thus reducing the cost of potential negative impact on coast erosion, due to lack of planning. Mauritius and Seychelles will review the existing legislation and institutional framework for the development of a Regional Coral Reef Restoration Plan that will also include Coral Management Plan, improve enforcement in both countries, and promote coral farming at the community levels, and promote regional studies on coral reef restoration. Through the study on genetic connectivity between Mauritius and Seychelles, the biodiversity of the corals will be enhanced, and could be applied in decision making regarding the managing and enhancing of coral reef resources.

111. The project is also cost effective in that through the component on knowledge sharing and dissemination, and capacity building there will be multiple add-on impacts for the WIO region as a whole. A coral reef restoration Toolkit has already been produced by Nature Seychelles³⁹. As part of the scaling up of activities the Toolkit will be revised throughout the project to provide a resource for the region. The regional approach is a major approach for ensuring the cost-effectiveness of the project, through the sharing of experience, knowledge, research facilities, and other resources.

6.2 Social and Environmental Safeguards

112. The project will be implemented according to UNDP's environmental and social policies to ensure minimization of any environmental risks. The project has completed the standard UNDP social and environmental screening procedure (UNDP SESP attached as Annex D. The screening was undertaken to ensure that the project complies with UNDP Social and Environmental Standards (SES). The overall risk category is: Low.

113. Environmental Impact Assessment (EIA) is not required for the envisage type of scale of coral restoration works under this project, according to relevant provisions of the following laws for Mauritius and Seychelles in field of environment protection:

- Mauritius: The Environment Protection Act 2002; The Fisheries and Marine Resource Act 2007.
- Seychelles: The Environmental Protection Act 2016, Environmental Protection (Impact Assessment) Regulations.

114. To ensure compliance with UNDP SES, and meeting the requirement of the Adaptation Fund, an Environment and Social Risk Management Plan (ESMP) has been prepared. Annex E presents the detailed ESMP, linking Project Activities with

³⁹ Frias-Torres S, Montoya-Maya PH, Shah N.J (Eds.) 2015. Coral Reef Restoration Toolkit: A Field-Oriented Guide Developed in the Seychelles Islands. Nature Seychelles, Mahe, Republic of Seychelles.

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identified risks; the role of stakeholders in the implementation of the ESMP; the institutional arrangement; and the frequency of monitoring and reporting of the identified environmental and social impacts and risks...

115. Environmental and social grievances will be reported to the AF in the Annual PPRs.

6.3 Sustainability and Scaling Up

116. To ensure the project's long-term sustainability beyond the funding period, transition arrangements include business plans, and accessing funds from the Corporate Social Responsibility (CSR) Programme in each country.

117. Marine Protected Areas (MPAs) with effective enforcement have been targeted for restoration (at selected sites within MPAs) in both Mauritius and Seychelles because: 1) they provide a protected environment so the effects of the coral reef restoration activity can be scientifically quantified without interference from confounding factors (i.e. fishing, anchor damage from boats, runoff pollution, etc), and the coral reefs restored there will also be protected as per MPA regulations, 2) they have an existing ecotourism infrastructure so any increase in job opportunities and benefits to locals can be incorporated quickly within the MPA system, 3) they are an ideal location to showcase the coral reef restoration work for educational, capacity building and ecotourism purposes because there's already a communication infrastructure in place for them.

118. The development of a coral reef economic and financial strategies or business plan for each coral reef restoration initiative is a key element in ensuring sustainability.

119. In Mauritius, the focus will be on community-based coral reef restoration. Restored and nursery sites located in MPAs can generate new income opportunities for coastal communities by increasing tourist activities. A coral reef economic and financial plan will be developed for the sustainable financing and maintenance of coral reef restoration activities. The project provides an opportunity to develop partnerships with the diving and hotel industries using CSR opportunities to leverage funding. In Mauritius, under the Finance Act 2015, all companies must put 2% of their chargeable income of the preceding year towards a CSR Programme, which must have objectives of benefiting Mauritian communities. Similarly, in Seychelles, there is a CSR contribution of 0.5% of the monthly turnover, of which half can go to approved NGOs. Such regulatory set-up in both countries provides opportunities for private sector finance (especially the tourism industry) to actively and directly support small scale coral reef restoration activities through the CSR funding. The involvement of other industry partnerships in active coral reef restoration activities will be streamlined once the active coral reef restoration activities are more standardized, their effectiveness and results monitored regularly and disseminated widely. Moreover, coral reef restoration is in line with the Mauritian Government's budgetary measure in 2017⁴⁰ to promote

⁴⁰ Government of Mauritius, Budget Speech 2017-2018

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development of alternative livelihood opportunities for coastal communities through coral farming by fishermen.

120. The Seychelles, on the other hand will prepare both a business plan and a strategic plan for making long-term, large-scale coral reef restoration financially viable, with several strategies that generate income to be invested again in the coral reef restoration effort: 1) Mass-Production and sell of farmed fast-growing corals for reef restoration and for the international aquarium trade (CITES compliant); 2) Leverage other opportunities in mariculture of low trophic level species, with facilities and capacity available; 3) Attract other marine Research & Development (R&D) projects, partners, researchers and students (with facilities and capacity available) to establish platform and knowledge hubs; 4) Provide training and boot camp learning programs for national and international trainees in coral mariculture and coral reef restoration, and 5) Partner with hotel resorts and other private sector businesses for coral reef restoration using CSR funds
121. The project has a comprehensive specific learning and knowledge management component to ensure that lessons learned are incorporated into broader stakeholder initiatives. Briefly, 1) Studies, reports and research papers on coral reef restoration projects, locally and in the region will be made available; 2) Capacity of key stakeholders on coral reef restoration techniques will be built; 3) Active participation and collaboration of key stakeholders will ensure the timely update of the coral reef restoration Toolkit manual; 4) Selected stakeholders will complete coral reef restoration training and, 5) Project staff will be trained in genetic analysis of coral zooxanthellae Symbiodinium clades, and techniques of micro fragmentation and fusion of massive corals and standardized coral reef monitoring, so all stakeholders will be able to undertake their respective roles and responsibilities under a commonly shared Coral Reef Monitoring protocol.
122. The long-term sustainability of active coral reef restoration efforts can only be ensured if coral recruitment is enhanced, either by the coral transplants becoming an additional source of recruits or by the attraction of recruits from elsewhere due to the settlement cues associated with the presence of corals⁴¹. This indicates the importance of establishing a permanent monitoring programme at each coral reef restoration site to develop a full understanding of the evolution of the restored coral reefs.
123. To ensure long-term sustainability of active coral reef restoration effort and scale up of restoration activities a regional coral reef restoration plan will be developed. This will consider the management of coral reefs, enforcement plan, DRR aspect, the strategic restoration plan, knowledge sharing, capacity building, regional studies and long term collaboration of the countries in the region.
124. Feasibility and experience built on the project will appeal to other funding donors for future coral restoration projects. A collaboration with private sector on coral reef restoration activities is also viable. During consultative process, it was noted

⁴¹ Montoya-Maya PH, Smit KP, Burt AJ, Frias-Torres S. (2016). Large-scale coral reef restoration could assist natural recovery: a case study in Seychelles, Indian Ocean. *Nature Conservation*

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that the private sector was also interested in the coral restoration works, however, they were not aware of the coral reef restoration in a changing climate context. As such, securing funds from potential funding donors and collaboration with private sector will further ensure the sustainability of the coral reef restoration efforts.

6.4 Incremental reasoning for AF support

Component 1. Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius.

Baseline (without AF Resources)

125. In Mauritius, as in all SIDS, the main climate change threats, confirmed in many cases by meteorological observations, are changes in rainfall patterns leading to flooding and landslides, extended periods of drought, increases in sea surface temperature, changes in ocean acidity which weakens the carbonate structure of reefs, and increases in storms, storm surges and sea level rise. Escalating coastal erosion and flooding events are already being felt in Mauritius.
126. Between 1998 and 2007, mean sea level rose by 2.1mm per year in Mauritius and since then has been rising by around 3.8 mm/year; average temperature has risen by 0.74oC when compared to the 1961-90 average; flash floods in 2008 and 2013 resulted in loss of lives; and there has been an increase in the frequency of extreme weather events, heavy rains and storms. It is predicted that half of the beaches on Mauritius could disappear by the middle of the century, which would be disastrous for the tourism industry.
127. Flooding in the coastal areas of Mauritius is already increasing, affecting many of the most populated locations given that these locations are concentrated on the low-elevation coastal areas; large relative increases in flooding are projected in the small island region of the Indian Ocean. In Mauritius, the impacts of cyclones and tropical storms have intensified and this trend is projected to continue as Mauritius lies in the South Western Indian Ocean cyclone basin. There is also evidence that wave action in coastal areas has increased as a result of climate change, with sea level rise exacerbating coastal erosion as the waves reach further inland at high tide.
128. Mauritius is particularly vulnerable. It is ranked 13th in terms of overall disaster risk (measured according to the extent that natural hazards - floods, droughts, storms, earthquakes and sea level rise - coincide with a vulnerable society) on the World Risk Index (on this set of parameters it is at highest risk of all the African nations) and 7th on the list of countries most exposed to natural hazards.
129. In 2011, insured losses from natural disasters, especially coastal (and riverine) hazards, reached globally US\$105 billion, an all-time high. The Indian Ocean, one of the most disaster-prone regions, is particularly vulnerable to storms and wave surge, coastal flooding and sea-level rise.
130. Mauritius has developed comprehensive action plans and strategies to adapt to the negative environment and socio-economic impacts of climate change, and also

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to protect and sustainably manage ecosystems, such as coral reefs, that provide services that will provide concrete adaptation measures for climate change.

131. Mauritius has a Climate Change Action Plan in place and has invested significant resources in starting to develop appropriate adaptation and mitigation measures, and planning is in place for the introduction of a Climate Change Bill. A National Climate Change Adaptation Policy Framework and a Technology Needs Assessment (TNA) identifying and prioritizing relevant technologies for adaptation to and mitigation of climate change impacts has been prepared that highlights the importance of adaptation to Mauritius. A Climate Change Information Centre has been set up, with the support of UNDP, the Inter-Regional Technical Support Component of the Africa Adaptation Programme and Japan International Cooperation Agency (JICA) funded by the Government of Japan.
132. In Mauritius, work is underway to strengthen the management of and expand the network of MPAs, with the support of the forthcoming GEF project, and this will help protect coral reefs in situ.
133. However, the costs of implementing all the adaptation measures are extremely high and for Mauritius, further active measures and financial and technical support are required to ensure that life and property are protected from disaster and that food security and livelihoods are assured.
134. Coastal erosion is being addressed in Mauritius through the continual upgrading of infrastructure (e.g. rock armouring, sea-walls, break-water/piers, groynes) and through reclamation. This strategy results in a fragmented approach, with the tourist industry covering costs to protect beaches, government financing the protection of public infrastructure, and private owners safeguarding their own investments. In extreme cases, infrastructure such as roads has to be moved away from the shoreline. Under the business as usual scenario, coastal erosion is thus likely to continue, affecting public and private/hotel beaches and impacting on the recreational enjoyment of the public and the willingness of tourists to both countries. The potential impact of coastal erosion on tourism in Mauritius is already of concern to the government and efforts are underway to reduce this but these are costly and not necessarily effective.
135. As coral reefs decline, fewer tourists will come for the purpose of diving and snorkelling, and already the government is promoting a strategy of greater diversification of tourist attractions.
136. Flooding of coastal communities will continue to increase; artisanal fish catches will continue to decline and food security will be jeopardized. Coral reefs will be protected within the MPAs for their biodiversity values and for tourism and fisheries purposes, but MPAs are not always in locations where the coral reefs can provide buffering services to protect coastal infrastructure and communities, and the management of the MPAs rarely takes adaptation to climate change and food security into account.
137. Mauritius has undertaken pilot activities in coral reef restoration, but these have been uncoordinated and have often lacked sustainability and adequate resources

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for maintenance and monitoring. Existing adaptation efforts have not adequately incorporated Ecosystem based Approaches (EbA) to adaptation.

Additionality (with AF Resources)

138. Up to now coral reef restoration efforts have not been up to scale in Mauritius, despite the fact that Climate Change and El Nino regularly affect the existing coral reefs. Hence there is need to upscale coral reef restoration efforts significantly. Also, there is need to learn from other coral reef restoration efforts in the Indian Ocean so as to obtain the most climate resilient methods available and improve on them.
139. With AF financing, activities under the proposed project will result in the restoration of degraded coral reefs in key locations in Mauritius that ultimately will have the outcomes of:
140. More effective shore protection and a buffering service against erosion and floods on the long term
141. Enhanced economic activities, leading to improved livelihoods and greater food security as a result of increased fish catches for coastal communities, and increased enjoyment of reefs for tourists, leading to greater employment for local people through the tourism industry
142. Have trained workforce available for future partnership in coral restoration activities, nationally.
143. The additional resourcing will provide an opportunity to upscale initiatives significantly to restore degraded coral reefs, and to ensure that they provide improved livelihoods for local communities and in the long-term benefit the national economy. The sites where coral reefs would be restored may well become visitor destinations in their own right, attracting scientists, tourists and the general public.

Component 2. Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Seychelles

Baseline (without AF Resources)

144. In Seychelles, as in all SIDS, the main climate change threats, confirmed in many cases by meteorological observations, are changes in rainfall patterns leading to flooding and landslides, extended periods of drought, increases in sea temperature, changes in ocean acidity which weakens the carbonate structure of coral reefs, and increases in storms, storm surges and sea level rise. Escalating coastal erosion and flooding events are already being felt in Seychelles.
145. Rates of sea level rise around Mahe in Seychelles have been measured at 1.46 mm a year. It has been estimated that globally, without adaptation, a 1 m rise in sea level will produce a 14-fold increase in flooding compared to the situation without sea-level rise. Even under a lower sea-level rise scenario of 38 cm by the 2080s, the global increase in flooding will be seven-fold compared with the

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situation without sea-level rise. Shore wave heights are limited by water depths, so with the increase in sea level, the height of waves will also increase.

146. Flooding in the coastal areas of Seychelles is already increasing, affecting many of the most populated locations because these are concentrated on the low-elevation coastal areas, and there are predicted to be large relative increases in flooding in the small island region of the Indian Ocean. In Seychelles, the impacts of cyclones and tropical storms have intensified and this trend is projected to continue. Although Seychelles is situated just north of the South Western Indian Ocean cyclone basin, the granitic islands are affected by the associated extreme rainfall and wave swells. There is also evidence that wave action in coastal areas has increased as a result of climate change, with sea level rise exacerbating coastal erosion as the waves reach further inland at high tide.
147. Seychelles is considered less at risk than Mauritius due to its favourable socio-economic status (it ranks 153rd) but lacks the ability to reduce overall risk: since the beginning of the 1990's, Official Development Assistance (ODA) flows have fallen by over 90% and this has placed a financial burden on the Government's budget. Furthermore, of the 86% of the Seychelles population living on Mahe, around 60% of people live in coastal areas; the remaining 14% of the population live mostly on Praslin and La Digue and almost all people live in the narrow coastal plains. Thus around 75% of the population may be considered vulnerable to climate change risks and in need of adaptation measures.
148. In 2011, insured losses from natural disasters, especially coastal (and riverine) hazards, reached globally US\$105 billion, an all-time high. The Indian Ocean, one of the most disaster-prone regions, is particularly vulnerable to storms and wave surge, coastal flooding and sea-level rise.
149. Seychelles has developed comprehensive action plans and strategies to adapt to the negative environment and socio-economic impacts of climate change, and also to protect and sustainably manage ecosystems, such as coral reefs, that provide services that will provide concrete adaptation measures for climate change.
150. In both countries, work is underway to strengthen the management of and expand the network of MPAs, with the support of the forthcoming GEF project, and this will help protect coral reefs in situ. The recently completed GOS-UNDP-GEF project 'Strengthening Seychelles' Protected Area System through NGO management modalities'.
151. In Seychelles, progress will be made toward adaption as a result of the Seychelles MSP Initiative which will produce a national multi-use marine spatial plan that guide the strategies and interventions to be undertaken through the Seychelles Conservation & Climate Adaptation Trust (SeyCCAT). SeyCCAT will ultimately lead to designation for some 30% of the EEZ as protected areas, half of which is planned to be strict no take zones.
152. However, the costs of implementing all the adaptation measures are extremely high and for both countries, further active measures and financial and technical

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support are required to ensure that life and property are protected from disaster and that food security and livelihoods are assured.

153. Coastal erosion is being addressed in Seychelles through the continual upgrading of infrastructure (e.g. rock armouring, sea-walls, break-water/piers, groynes) and through a strong focus on land reclamation. This strategy results in a fragmented approach, with the tourist industry covering costs to protect beaches, government financing the protection of public infrastructure, and private owners safeguarding their own investments. In extreme cases, infrastructure such as roads has to be moved away from the shoreline. Under the business as usual scenario, coastal erosion is thus likely to continue, affecting public and private/hotel beaches and impacting on the recreational enjoyment of the public and the willingness of tourists visit Seychelles.
154. As coral reefs decline, fewer tourists will come for the purpose of diving and snorkelling, and already the government is promoting a strategy of greater diversification of attractions.
155. Flooding of coastal communities will continue to increase; artisanal fish catches will continue to decline and food security will be jeopardized. Reefs will be protected within the MPAs for their biodiversity values and for tourism and fisheries purposes, but MPAs are not always in locations where the reefs can provide buffering services to protect coastal infrastructure and communities, and the management of the MPAs rarely takes adaptation to climate change and food security into account.
156. Seychelles has undertaken pilot and large-scale activities in coral reef restoration, but these have been uncoordinated and have often lacked sustainability and adequate resources for maintenance and monitoring. In Seychelles, the Government has recognized as a shortcoming that existing adaptation efforts have not adequately incorporated EbA. Therefore, it has identified EbA as its priority for adaptation fund financing—seeking to put in place the requisite management systems.

Additionality (with AF Resources)

157. With AF financing, activities under the proposed project will result in the restoration of degraded coral reefs in key locations in Seychelles that ultimately will have the outcomes of: (1) More effective shore protection and a buffering service against erosion and floods, and (2) Enhanced economic activities, leading to improved livelihoods and greater food security as a result of increased fish catches for coastal communities, and increased enjoyment of reefs for tourists, leading to greater employment for local people through the tourism industry
158. The additional resourcing will provide an opportunity to upscale initiatives significantly to restore degraded reefs, and to ensure that they provide improved livelihoods for local communities and in the long-term benefit the national economies of both countries.

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159. The sites where coral reefs have been restored may well become visitor destinations in their own right, attracting scientists, tourists and the general public. These efforts are expected to increase public awareness of the coastal adaptation issues in Seychelles and an understanding of cost-effective solutions to climate change impacts.

Component 3. Knowledge management, training and sensitization to build regional capacity for sustainable reef restoration

Baseline (without AF Resources)

160. Institutional capacity for coral reef restoration will remain insufficient, with limited technical knowledge. Coral reef restoration efforts will remain small scale, wasting financial and human resources on initiatives that are not sustainable in the long term and efforts will remain fragmented and uncoordinated. No systematic knowledge management system with adequate ecosystem-based adaptation elements will be developed and instituted. Up-scaling of best practices will therefore be unlikely to happen.

161. Currently, there is no regional exchange of knowledge in coral reef restoration techniques and efforts. Neither is there a standardized approach in coral restoration efforts.

Additionality (with AF Resources)

162. With the financing rendered through the Adaptation Fund, decision makers, local communities and the general public will have a good understanding of coral reef restoration and how it will contribute to comprehensive adaptation measures. This approach will increase the likelihood that both countries will succeed in their adaptation efforts. Institutions will be strengthened in skills and capacity for active reef restoration, and knowledge generated and shared.

163. Moreover, the project will enable the implementation of regional capacity in coral reef restoration, with the promotion of a more standardized science-based approach and cumulative knowledge through sharing experiences. All people engaged in the coral reef restoration project will benefit from the latest scientific knowledge and techniques.

164. Currently results in coral reef restoration have been publicized for some projects in Seychelles but not all projects in Mauritius and Seychelles. As such AF support will provide regional and international visibility on actions initiated and results obtained in both countries. The AF financing will also enable for improved livelihood opportunities, e.g. creation business opportunities as a result of coral reef restoration activities at the community level.

165. With AF financing, Mauritius and Seychelles will enable the compilation of spatio-temporal data on current wave pattern, which will be used as a planning tool for future restoration to maximize coastal protection and minimize potential negative impacts on the coasts. Additionally, the AF financing will enable the review of the

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legislative and institutional framework of both countries to develop a regional coral reef restoration plan.

Project Results Framework

7 PROJECT RESULTS FRAMEWORK

<p>This project will contribute to the following Sustainable Development Goal (s): SDG 3 – Good health and wellbeing: Ensure healthy lives and promote well-being for all at all ages SDG 13 – Climate action: Take urgent action to combat climate change and its impacts SDG 14 – Life below water: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.</p>
<p>This project will contribute to the following country outcome included in the UNDAF/Country Programme Document: <u>Mauritius:</u> Design and implementation of a portfolio of activities and solutions developed at national and subnational levels for sustainable management of natural resources, integration of ecosystem services approaches sound management of chemicals and waste, while ensuring that climate change challenges in terms of adaptation and mitigation are fully addressed. <u>Seychelles:</u> A sustainable Seychelles with enhanced economic growth, income opportunities and social inclusion, supported and promoted by responsive strategies towards poverty reduction and gender equality. Building economic and environmental resilience through the design, implementation and integration of sustainable solutions into development planning processes at national and subnational levels to support the blue economy concept, while ensuring climate change adaptation and mitigation concerns are fully addressed.</p>
<p>This project will be linked to the following output of the UNDP Strategic Plan: Output 1.3: Solutions developed at national and sub-national levels for sustainable management of natural resources, ecosystem services, chemicals and waste. Output 1.4: Scaled up action on climate change adaptation and mitigation cross sectors which is funded and implemented. Output 2.5: Legal and regulatory frameworks, policies and institutions enabled to ensure the conservation, sustainable use, and access and benefit sharing of natural resources, biodiversity and ecosystems, in line with international conventions and national legislation.</p>

Table 1 Project Result Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
Project Objective 1: To improve food security and livelihoods and mitigate disaster risk through active			Targeted degraded sites restored to scale using farmed corals, with good survivorship and growth rates of the colonies	<u>Mauritius:</u> 0.075ha (750 m ²) in Mauritius (non-project sites) 0 Ha at BBMP and SEMPA (project sites) <u>Seychelles:</u> 0.5 ha (5.225 m ²)	<u>Mauritius:</u> Overall 1.6 Ha in project sites <u>Seychelles:</u> 1.25 Ha in project sites	At least 3.2 Ha in Mauritius and 2.5 Ha in Seychelles	Survey, evaluation report, Annual Progress Report	No major events (climate, tsunami) occur during the project period, allowing the timely transplantation of nursery grown coral colonies.

⁴² Baseline, mid-term and end of project target levels must be expressed in the same neutral unit of analysis as the corresponding indicator. Baseline is the current/original status or condition and need to be quantified. The baseline must be established before the project document is submitted to the AF for final approval. The baseline values will be used to measure the success of the project through implementation monitoring and evaluation.

⁴³ Target is the change in the baseline value that will be achieved by the mid-term review and then again by the terminal evaluation.

⁴⁴ Risks must be outlined in the Feasibility section of this project document.

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
restoration of coral reefs degraded by coral bleaching as a result of climate change in Mauritius and Seychelles, at a larger scale than ever tested in the past			Number of stakeholders with improved livelihoods due to new and sustained employment & business opportunities related to coral restoration activities and/or due to the improved coastal and marine ecosystems supported by the restored corals	0	At least 200 persons	At least 800 persons	<i>Livelihood Survey</i>	Coastal communities and stakeholders have successfully completed the training provided and are interested in undertaking new business approach for coral-based business. Still room left for growth for economic activities (e.g. tourism) without compromising the health of the coastal and marine ecosystems supported by the restored corals.
			Number of people trained and involved in the establishment, maintenance and monitoring of successful ocean nurseries for corals	0	At least 500	In Mauritius, at least 20 community members involved In Seychelles: Cousin: 6 staffs, volunteers and 10 community members. Ste Anne/Anse Forbans: 4 staff, Communities and 10 Community members Curieuse: 4 staff and 12 rotating volunteers	Monitoring and evaluation reports for land-based and ocean-based nurseries; staff contracts; volunteer contracts	Low turnover for community members and staff involved until the end of the project Scientific diver volunteers change every 3 months Community member, staff and volunteers learn to work together through the project lifetime Sufficient number of qualified local population interested in the training and engagement in coral restoration work.
Project Objective 2: To generate knowledge			Number research papers on coral reef restoration submitted for presentation at	0		At least 3 papers published	Report published in peer-reviewed	Studies, Reports and Research papers on coral reef restoration initiatives in the region and

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
about effective restoration techniques for dissemination to other SIDS and countries within the wider region.			various scientific forums in the WIO and globally, with female scientists' participation in publication efforts actively supported.		At least 5 female scientists contributed in the production of scientific publication	At least 5 female scientists contributed in the production of scientific publication	journals & Project Progress Report	globally available and accessible. Capacity of key stakeholders on coral reef restoration techniques and coral genetics analysis including clade analysis built.
			Number of "lessons learned" generated and disseminated through various communication channels and knowledge exchange fora on the practical topics relevant to the coral restoration efforts at scale, including 1) coral restoration financing, 2) climate change resilience of the applied techniques, 3) upscaling efforts, 4) financial and technical sustainability, 5) stakeholder and private sector engagement and buy-ins, 6) women and youth empowerment;	zero	At least 1 brief on coral restoration financing At least 1 brief on climate change resilience At least 1 brief on coastal restoration at scale At least 1 brief on financial and technical sustainability At least 1 brief on stakeholder and/or private sector engagement At least 1 brief on women and youth empowerment	At least 1 brief on coral restoration financing At least 1 brief on climate change resilience At least 1 brief on coastal restoration at scale At least 1 brief on financial and technical sustainability At least 1 brief on stakeholder and/or private sector engagement At least 1 brief on women and youth empowerment	"Lessons learned" communication materials (in any appropriate format)	Sufficient number of qualified female scientists interested in the coral restoration science field.

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
Component⁴⁵ 1 Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius.	Outcome 1.1: Improved livelihood for a sustainable partnership and community based approach to reef restoration	Output 1.1.1 Coastal communities benefit from improved livelihoods through employment establishing and maintaining coral nurseries and transplantation sites.	Number of community members (as identified in Community Action Plan and any other complementary analysis) trained in establishing and maintaining proposed coral nurseries (Data disaggregated by community groups, gender and age group), with a particular attention given to increasing female and youth participants/trainees	0	At least 20 for Mauritius 11 for Rodrigues Data collected aggregated by sex, age and household status	At least 20 for Mauritius 11 for Rodrigues Data collected aggregated by sex, age and household status	Training Reports	Community members have successfully completed the training provided
		Output 1.1.2 Coastal communities benefit from improved livelihoods through increased revenue from alternative work including tourism (glass bottom boat tours, snorkelling and diving trips)	Number of coral restoration economic and financial strategies developed for sustainable financing mechanism	0	1 coral restoration economic and financial strategy developed for Mauritius and Rodrigues	1 coral restoration economic and financial strategy developed for Mauritius and Rodrigues	coral restoration economic and financial strategy document	Mauritius economy remains stable, tourism remains at same level or higher, so that the business plan is implemented as written.
			Number of partnership agreement signed for job opportunities	0	at least 1 agreement signed, and new employment opportunities created	at least 2 agreements signed, and new employment opportunities created	Signed Agreement document	Mauritius economy remains stable, tourism remains at same level or higher, so that the business plan is implemented as written.
			Number of people benefiting from improved income as result of the project,	0	At least 50 persons (disaggregated by sex, age and	At least 100 persons (disaggregated by sex, age and	Livelihood surveys, annual reports from NGOs	Coastal communities have successfully completed the training provided and are

⁴⁵Outcomes are short to medium term results that the project makes a contribution towards, and that are designed to help achieve the longer-term objective. Achievement of outcomes will be influenced both by project outputs and additional factors that may be outside the direct control of the project.

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
			with particular attention given to increasing beneficiaries from female-headed households.		household status) by end of project	household status) by end of project		participating fully throughout the duration of the project
	Outcome 1.2: Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals	Output 1.2.1 Donor coral colonies of appropriate species (resilience, maintaining genetic diversity) available at sufficient scale (quantity, time, intervals etc.) for propagation in nurseries	Number of coral species for propagation based on resilience and genetic diversity identified.	none	Coral species identified and validated by the Project Steering Committee	Coral species identified and validated by the Project Steering Committee	Technical Assessment Report on coral species identified, Minutes of Steering Committees	Preliminary findings on list of coral species that are suitable for culture in Mauritius readily available. Personnel of the MOI has been effectively trained for clade analysis and genetic connectivity.
Number of donor sites with locally threatened species (Mauritius & Rodrigues) identified			None	at least 2 donor sites identified	at least 2 donor sites identified	Survey Reports	Preliminary findings on list of locally threatened coral species readily available. Favourable weather conditions allow the timely completion of surveys	
percentage of high-thermal tolerance corals collected from donor sites for propagation in nurseries.			0%	not more than 10 % of each donor coral colony will be collected to avoid death of donor corals at donor site	not more than 10 % of each donor coral colony will be collected to avoid death of donor corals at donor site	Technical assessment report, Report on genetic analysis, survey report of donor site	Favourable weather conditions, including no extreme El Niño events causing bleaching of aqua-cultured resilient coral species	
Output 1.2.2 Reports on coral reef status, water quality, and other key environmental and social parameters for potential nursery sites		Not yet undertaken	3 Reports on coral reef status, water quality, current patterns/flushing and other key environmental and social parameters for potential nursery sites produced	6 Reports on coral reef status, water quality, current patterns/flushing and other key environmental and social parameters for potential	Survey reports	List of Nursery site locations based in MPAs/Marine Parks available, Favourable weather conditions allow the timely completion of surveys		

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
						nursery sites produced		
			Number of Environmental and Social Monitoring surveys carried out	0	3 surveys by mid-term, as per ES Risk Assessment	6 surveys by end of project, as per ES Risk Assessment	Environment and Social Monitoring Reports	implementation of the project does not lead to social issues.
		Output 1.2.3 A land-based nursery and 2 or more ocean nurseries established and maintained on a regular basis	Number of Land based nursery established and operational	0	One land-based nursery established and operational	One land-based nursery established and operational	Monitoring and evaluation report for nursery site, Physical verification (site visits), Operational reports, List of assets	Timely delivery and availability of necessary equipment for set up of nurseries
			Number of infrastructures for nursery seeding from sexual reproduction (Mauritius) established	Infrastructure non-existing	one Infrastructure established	one Infrastructure established and operational	Monitoring and evaluation report for nursery site, Physical verification (site visits), Operational reports, List of assets	Favourable weather conditions allow the timely collection of spawns/larvae from the wild during spawning seasons
			Number of ocean-based nurseries established and operational in Mauritius	1 ocean-based nursery is currently operational	1 new ocean-based nursery established and operational with 100 basal tables, 100 multi-layered ropes nursery units	1 new ocean-based nursery established and operational with 100 basal tables, 100 multi-layered ropes nursery units	Monitoring and evaluation report for nursery site, Physical verification (site visits), Operational reports, List of assets	Timely delivery and availability of necessary equipment

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
			Number of community members involved in the maintenance and monitoring of new ocean-based nurseries in Mauritius	0	At least 20 community members involved	At least 20 community members involved	Monitoring and evaluation report for nursery site	Community members involved till the end of the project - low turnover
			Number of ocean-based nurseries established and operational in Rodrigues	No sea-based nursery is currently operational	1 ocean-based nursery established and operational with 40 multi-layered ropes nursery unit	1 ocean-based nursery established and operational with 40 multi-layered ropes nursery unit	Monitoring and evaluation report for nursery site, Physical verification (site visits), Operational reports, List of assets	Timely delivery and availability of necessary equipment
			Number of community members involved in the maintenance and monitoring of sea-based nurseries in Rodrigues	0	At least 11 community members fully involved	At least 11 community members fully involved	Trained work force in field of coral farm management Monitoring and evaluation report (from monitoring)	Community members involved till the end of the project
		Output 1.2.4 Stock of farmed corals available for transplantation	Number of coral fragments under culture in land-based nursery (Mauritius)	0	7,000 coral fragments (including resilient species and locally threatened coral species)	15,000 coral fragments (including resilient species and locally threatened coral species)	Monitoring and evaluation report for nursery site	The actual survival rate of coral fragments is as per estimated survival rates based on past studies and research undertaken by MOI (75%)
			Percentage of coral polyps successfully settled in situ	0%	1.5% of polyps settled from each spawning. (approximately 1500 recruits per year)	1.5% of polyps settled from each spawning. (approximately 1500 recruits per year)	Technical and monitoring reports	Surveys of dates of spawning have been identified correctly and that all conditions are favourable for settling of coral polyps.

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
			Number of coral fragments under culture in new sea-based nurseries in Mauritius	0	60,000 fragments	120,000 fragments	Monitoring and evaluation report for nursery site	The actual survival rate of coral fragments is as per estimated survival rates based on past studies and research undertaken by MOI (75%)
			Number of coral fragments under culture in sea-based nurseries in Rodrigues	0	20,000 fragments for multi-layered rope nursery unit	40,000 fragments for multi-layered rope nursery unit	Monitoring and evaluation report	Timely delivery and availability of necessary equipment Favourable weather conditions allow the timely completion of surveys
	Outcome 1.3: The health of degraded reefs restored, through active restoration work, maintenance and monitoring efforts, leading ultimately to greater protection of shore from flooding and storm damage	Output 1.3.1: Rugosity and structure of reefs restored, leading ultimately to greater protection of shore from erosion.	Areas of site successfully restored using farmed corals of resilient species in Mauritius and Rodrigues	Total of 750 m2 restored at Trou aux Biches (150m ²), Flic en Flac (250m ²), Albion (350 m ²) No restored site in BBMP	1.2 Ha in Mauritius and 0.3 Ha in Rodrigues	2.5 Ha in Mauritius and 0.7 Ha in Rodrigues	Monitoring reports GIS Mapping	Favourable weather conditions allow the timely completion of surveys, transplantation of corals, maintenance and monitoring of restored sites
		Output 1.3.2 Recovery of fish population and other reef associated fauna and flora, leading ultimately to improved food security in Mauritius and Rodrigues.	percentage of live coral cover and quality of restoration sites (including, restored coral health status, coral recruitment, fish biomass, fish diversity and fish catch amongst others)	% live coral: NA Fish population and fish catch: NA	-	at least 10 % increase in live coral cover, fish density and diversity.	Annual monitoring report to assess the temporal progress of the project.	Favourable weather conditions (incl. no El Nino events experience). There is high survival rate of transplanted corals.
Component 2 Enhancement of food security and reduction of risks from natural disasters	Outcome 2.1 Improved livelihood for a sustainable partnership to coral reef restoration	Output 2.1.1 Coastal communities benefit from improved livelihoods through employment establishing and maintaining coral	Number of people trained in establishment and maintenance of coral nurseries (Data disaggregated by community groups, gender and age group), with a particular	0	At least 30 people by end of project	At least 60 people by end of project	Surveys, Training certificates, annual reports from NGOs	Participants are willing to be trained in coral reef restoration and have successfully completed the training provided

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
through the restoration of degraded reefs in Seychelles		nurseries and transplantation sites.	attention given to increasing female and youth participants/trainees					
		Output 2.1.2 Coastal communities benefit from improved livelihoods through increased revenue from alternative work including tourism (glass bottom boat tours, snorkelling and diving trips)	Number of sustainable financing mechanisms for the maintenance and monitoring of coral restoration activities with recommendations	Draft business plan	1 Business plan produced including marketing & development of 1 product, at least 1 MOUs and new employment opportunities created	1 Business plan produced including marketing & development of 2 products, at least 2 MOUs and new employment opportunities created	Statistics from Government of Seychelles Signed MOUs Business plan document Products marketed & sold	Seychelles economy remains stable, tourism remains at same level or higher, so the business plan is implemented as written
			Number of stakeholders with improved livelihoods due to new employment & business opportunities, with particular attention given to increasing beneficiaries from female-headed households.	0	At least 30 people by end of project (Data disaggregated by community groups, household status, gender and age group)	At least 60 people by end of project (Data disaggregated by community groups, household status, gender and age group)	Surveys, annual reports from NGOs	Participants are willing to be trained in coral reef restoration and have successfully completed the training provided Sufficient entrepreneurs motivated to develop associated business opportunities
	Outcome 2.2 Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals	Output 2.2.1 Donor coral colonies of appropriate species (resilience, maintaining genetic diversity) available at sufficient scale (quantity, time, intervals etc.) for propagation in nurseries	Number of coral species for propagation based on resilience and genetic diversity identified	Coral species selected during previous Reef Rescuers Project (Nature Seychelles) based on survival from 1998 El Nino	Coral species identified and validated by the Project Steering Committee	Coral species identified and validated by the Project Steering Committee	Technical Report on coral species identified, Minutes of Steering Committee	New coral species selected will perform equally or better than coral species of the Reef Rescuers project
			Number of donor sites with resilient and resistant coral species identified	2 Donor sites identified and used for previous Reef Rescuers project (Nature Seychelles)	At least an additional donor site identified in Cousin island, Ste Anne, Cerf Islands	At least an additional donor site identified in Cousin island,	Donor site survey reports	List of local thermal tolerant coral species available Favourable weather conditions allow the timely completion of surveys

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
					and Curieuse/Praslin area.	Ste Anne, Cerf Islands and Curieuse/Praslin area.		
			percentage of climate resilient coral collected from donor sites for propagation in nurseries	0%	not more than 10 % of each donor coral colony will be collected to avoid death of donor corals at donor sites	not more than 10 % of each donor coral colony will be collected to avoid death of donor corals at donor sites	Technical assessment report, report on genetic analysis, survey report of donor site	Favourable weather conditions, including no extreme El Nino events causing bleaching of aqua-cultured resilient coral species.
		Output 2.2.2 Reports on coral reef status, water quality, and other key environmental and social parameters for potential nursery sites	Surveys for identification of nursery sites including parameters suitable for maximized coral growth	1 nursery site at Cousin Island; 1 nursery site at Curieuse Island; 1 nursery site at-Ste Anne/Ile aux Cerf	3 Nursery sites of different size operational	3 Nursery sites of different size operational	Reports on nursery sites	Species selection is science-based and performs as in previous projects. Adequate environmental conditions remain for ideal coral growth in nurseries
			Number of Environmental and Social Risk Assessment Reports	0	3	6	Annual Environment and Social Risk Assessment Reports	Implementation of the project does not lead to environmental and social issues
		Output 2.2.3 A land-based nursery established, and 2 or more ocean nurseries are established and maintained on a regular basis	Number of land-based nursery established and operational	2 small scale land nurseries at Beau Vallon (200 fragments) and Anse Forbans (100 fragments)	One additional land-based nursery established and operational at Cousin Island	One additional land-based nursery established and operational at Cousin Island	Monitoring and evaluation report for land-based nursery	Land based nursery will work for production of coral sexual recruits; availability of necessary workers, equipment and materials to build land-based nursery
			Number of ocean-based nurseries established and operational	Previous experience installing & maintaining ocean nurseries; midwater rope nurseries still operational: Existing ocean-based nurseries: in Curieuse, Ste Anne/Ile aux		Cousin: At least 10 new ocean nurseries; Curieuse: 20 new Nurseries; St Anne: 8 new Nurseries.	Monitoring and evaluation report for ocean nursery sites, physical verification (site visits), operational	Timely delivery and availability of necessary equipment and materials to build ocean nurseries

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
				Cerfs.Beau Vallon, and Cousin.			reports, list of assets	
			Number of people involved in the maintenance and monitoring of new land and ocean-based nurseries	Reef Rescuers project: Prior team of 3 permanent staff and 35 rotating volunteer scientific divers. Current team of 2 MCSS: 3 project staff and volunteers	Cousin: 6 staffs, volunteers and 10 community members. Ste Anne/Anse Forbans: 4 staff, Communities and 10 Community members Curieuse: 4 staff and 12 rotating volunteers	Cousin: 6 staffs, volunteers and 10 community members. Ste Anne/Anse Forbans: 4 staff, Communities and 10 Community members Curieuse: 4 staff and 12 rotating volunteers	Monitoring and evaluation reports for land-based and ocean-based nurseries; staff contracts; volunteer contracts	Low turnover for community members and staff involved until the end of the project Scientific diver volunteers change every 3 months Community member, staff and volunteers learn to work together through the project lifetime
		Output 2.2.4 Stock of farmed corals available for transplantation	Number of coral fragments under culture in land-based nursery	0	At least 500 corals growing in the land-based nursery derived from sexual and/or sexual reproduction	At least 1,000 corals growing in the land-based nursery derived from sexual and/or sexual reproduction	Monitoring and evaluation reports for land nursery site	The survival rate of coral fragments in the land nursery is similar or better than the survival rate in past ocean nurseries (75 %) implemented by Nature Seychelles
			Number of coral fragments under culture in new ocean nurseries	Past Reef Rescuers Project by Nature Seychelles grew 40,000 corals in ocean-based nurseries; at Cousin Island nursery site. Other: cultured corals in Curieuse (~2000 fragments), Ste Anne/Ile aux Cerfs (450 fragments), and Beau Vallon (400 fragments)	Cousin: At least 25,000 corals Curieuse: at least 20000 Ste Anne at least 6000 Total: 51,000.	Cousin: At least 50,000 corals Curieuse: at least 40000 Ste Anne at least 12500 Total: 102,500.	Monitoring and evaluation reports for ocean nursery site	The survival rate of coral fragments in ocean nurseries is similar (75%) or better than in previous Reef Rescuers project; No major mass bleaching events, or crown-of-thorns & Drupella snail invasions during project period

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
	Outcome 2.3 The health of degraded reefs restored, through active restoration work, maintenance and monitoring efforts, leading ultimately to greater protection of shore from flooding and storm damage	Output 2.3.1 Rugosity and structure of reefs restored, leading ultimately to greater protection of shore from erosion	Area of site successfully restored with nursery grown corals	Previous experience restoring a degraded reef with 25,000 nursery grown corals in the Reef Rescuers project covering 0.5 Ha	Cousin: At least 0.5 Ha of degraded reef Curieuse: 0.5 Ha over project life cycle Ste Anne: 0.1 Ha over project life cycle Anse Forbans: 0.1 Ha over project life cycle Total: 1.2 Ha	Cousin: At least 1 Ha of degraded reef Curieuse: 1 Ha over project life cycle Ste Anne: 0.25 Ha over project life cycle Anse Forbans: 0.25 Ha over project life cycle Total: 2.5 Ha	Monitoring reports, GIS Mapping	Favourable weather conditions allow the timely completion of surveys, transplantation of corals, maintenance and monitoring of restored sites The survival rate of transplanted corals is similar or better than in previous Reef Rescuers project; No major mass bleaching events, or crown-of-thorns & Drupella snail invasions during project period
			Number of people involved in cementing corals to the degraded reefs and monitoring restoration effects	Prior experience applying cementing techniques during the Reef Rescuers project: Cousin: 3 staff, 2 divers and 35 rotating volunteers SNPA: 4 staff and volunteers; MCSS: 3 staffs and volunteers	Cousin: 4 staff + volunteers rotating every 3 months or as needed SNPA: 4 staff and rotating volunteers MCSS: 4 staffs and volunteers	Cousin: 4 staff + volunteers rotating every 3 months or as needed SNPA: 4 staff and rotating volunteers MCSS: 4 staffs and volunteers	Monitoring reports for restored reefs; staff contracts; volunteer contracts	The survival rate of transplanted corals is similar or better than in previous Reef Rescuers project; No major mass bleaching events, or crown-of-thorns & Drupella snail invasions during project period
		Output 2.3.2 Recovery of fish population and other reef associated fauna and flora, leading ultimately to improved food security in Seychelles	percentage of live coral cover and quality of restoration sites (including, restored coral health status, coral recruitment, fish biomass, fish diversity and fish catch amongst others)	Percentage cover of live coral: --Curieuse 19% cover --Anse Forbans < 5% -- Ste Anne/Cerf 49% Average fish population per m ² at Ste Anne is 0.307. no data available for other sites	at least 10 % increase in live coral cover, fish density and diversity.	at least 10 % increase in live coral cover, fish density and diversity.	3 reports (coral reef ecosystem including, restored coral health status, coral recruitment, fish biomass, fish diversity and fish catch amongst others) to	Favourable weather conditions allow the timely completion of surveys, transplantation of corals, maintenance and monitoring of restored sites

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
							assess the temporal progress of the project - beginning, midterm and end of project	
Component 3 Knowledge management and sharing, training and sensitization to build regional capacity for sustainable reef restoration	Outcome 3.1 Improved understanding and knowledge management of use of reef restoration as an adaptation measure	Output 3.1.1 Comparative review and analysis of coral restoration initiatives in the region and globally, with gaps in knowledge identified	Comprehensive review of coral reef restoration in the region and globally undertaken	None	Draft Report/Paper on comprehensive review of coral reef restoration in the region and globally	Report/Paper on comprehensive review of coral reef restoration in the region and globally finalised and validated by the Project Steering Committee	Report on comprehensive review of coral reef restoration & Project Progress Report	Studies, Reports and Research papers on coral reef restoration initiatives in the region and globally available and accessible
		Output 3.1.2 Based on past and ongoing coral restorations efforts undertaken by the project and others, science-based best practice and methodologies (e.g. factors determining success in coral restoration are known; cost-effective approaches, etc.) developed, constraints and challenges identified and	Methodologies for coral restoration in Mauritius and Seychelles developed, based on best available science and practices	none	Draft Coral restoration methodology and good practices guide developed	Coral restoration methodology and good practices guide developed and validated by the project steering committee	Methodologies developed and adopted for coral reef restoration activities. Project Progress Report Guideline document & survey Report (currents/wave pattern, GIS/habitat mapping, physico-chemical surveys of sites, inventory of coral species,	Studies and Research papers on coral reef restoration methodology accessible Reports on past and current coral reef restoration projects locally and in the region readily available

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
		lessons learned documented.					genetic identification of resilient species, water quality amongst others)	
		Output 3.1.3 Research undertaken to provide information to guide restoration and enhance reef resilience where required (e.g. genetic connectivity of coral species, spawning seasons and coral recruitment patterns, resistant/resilient species and clades)	Research and surveys on key information for reef restoration undertaken	Preliminary surveys and analysis of past coral reef restoration projects undertaken	Regional research and analysis on key information coral reef resilience, and genetic diversity and connectivity ongoing	Regional research and analysis on key information coral reef resilience, and genetic diversity and connectivity undertaken	Report on research and analysis Published papers.	Capacity of key stakeholders on coral reef restoration techniques and coral genetics analysis including clade analysis built
	Outcome 3.2 Improved understanding within the WIO and globally of successful approaches to reef restoration, the constraints and challenges, with lessons learned incorporated into new initiatives	Output 3.2.1 Lessons learned in reef restoration documented and shared	Knowledge sharing platform on reef restoration for sharing lessons learned developed	0	Knowledge sharing platform developed	Knowledge sharing platform developed and operational	Project Progress report	Knowledge sharing platform developed and operational
		Output 3.2.2 Reef Restoration tool kit and manual for use in the WIO published and disseminated	Reef Restoration Manual developed	1	Updated Reef Restoration Manual drafted	Reef Restoration Manual updated, revised and published online	Coral Reef Manual and website where it is made accessible	Active participation and collaboration of the key stakeholders of coral reef restoration for the timely drafting of the manual

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
	Outcome 3.3 Regional capacity developed for sustainable and climate resilient coral restoration.	Output 3.3.1 Regional training programme on reef restoration in place, possibly with an associated Certificate of Competence	Number of members from Mauritius and Seychelles trained in coral reef restoration methods, with particular attention given to increasing female participants/beneficiaries from the capacity building activities	0	At least 7 Gender disaggregated data will be collected. Beneficiaries: representative of the WIO region countries involved in coral reef restoration	At least 20 Gender disaggregated data will be collected. Beneficiaries: representative of the WIO region countries involved in coral reef restoration	Project Progress report + Training report	Members have successfully completed the training provided
		Output 3.3.2 Regional training workshops undertaken on monitoring, DNA-based approach for the identification of resilient corals, genetic connectivity and other topics as appropriate	Number of members from Mauritius and Seychelles trained in advanced coral genetics including clade analysis, with particular attention given to increasing female participants/beneficiaries from the capacity building activities	0	End of project: At least 10 participants Gender disaggregated data will be collected. Beneficiaries: MBEMRFS, SNPA, Nature Seychelles, MCSS and some participants from the WIO region who are doing active in coral restoration work in the region.	End of project: At least 20 participants Gender disaggregated data will be collected. Beneficiaries: MBEMRFS, SNPA, Nature Seychelles, MCSS and some participants from the WIO region who are doing active in coral restoration work in the region.	Training report + Lab-book records	Recruitment of a consultant or sponsored training to an international genetic facility (with advanced knowledge in coral genetics) Timely delivery and availability of additional lab equipment
		Output 3.3.3. Sustainable long-term monitoring programme	Regional Coral Restoration Plan including national component and long-	0	Draft Regional Coral restoration plan developed	Regional Coral restoration plan developed and validated by the	Regional Coral Reef Restoration Plan	Literature on coral reef restoration selection criteria accessible Reports on past and current

Project Results Framework

Project Delivery	Outcome	Output	Verifiable Indicators	Baseline ⁴²	Mid-term Target ⁴³	End of Project Target	Means of Verification	Assumptions ⁴⁴
		developed and underway for restored reefs, based on international/regional protocols and best practice	term monitoring programme			Project Steering Committee and adopted by both countries	Project Progress Report	coral reef restoration projects locally readily available
	Participation in regional and international forums		0	0	participation to at least 1 relevant regional/international forums	Feedback report minutes of Regional/international forum	Commitment of stakeholders to produce research papers documenting the findings of the coral restoration initiative	
	Regional Studies on wave patten, beach erosion and mapping		0	At least 5 surveys (one in each site) by mid project	At least 10 by the end of the project.	Survey reports research paper	There is full cooperation between Mauritius and Seychelles. Commitment of stakeholders to produce research papers documenting the findings	

8 FINANCIAL PLANNING AND MANAGEMENT

166. The total cost of the project is USD 9,132,420, will be financed through financed through Adaptation Fund (AF) grant. UNDP, as the AF Implementing Entity, will be responsible for the execution of the AF resources transferred to UNDP bank account only.
167. Budget Revision and Tolerance: As per UNDP requirements outlined in the UNDP POPP, the Project Steering Committee will agree on a budget tolerance level for each plan under the overall annual work plan allowing the project manager to expend up to the tolerance level beyond the approved project budget amount for the year without requiring a revision from the Project Steering Committee. Should the following deviations occur, the Project Manager and UNDP Country Office will seek the approval of the UNDP-GEF team to ensure accurate reporting to the AF a) Budget re-allocations among components in the project with amounts involving 10% of the total project grant or more; b) Introduction of new budget items/or components that exceed 5% of original AF allocation. Any over expenditure incurred beyond the available AF grant amount will be absorbed by non-AF resources (e.g. UNDP TRAC or cash co-financing).
168. Audit: The project will be audited as per UNDP Financial Regulations and Rules and applicable audit policies. Audit cycle and process must be discussed during the Inception workshop.
169. Project Closure: Project closure will be conducted as per UNDP requirements outlined in the UNDP POPP. On an exceptional basis only, and if there is no increase of the project budget, one extension of the operational closure date beyond the initial duration of the project may be approved by the UNDP-GEF Directorate. However, all costs incurred to close the project must be included in the project closure budget and reported as final project commitments presented to the Project Board during the final project review. The only costs a project may incur following the final project review are those included in the project closure budget.
170. Operational completion: The project will be operationally completed when the last UNDP-financed inputs have been provided and the related activities have been completed. This includes the final clearance of the Terminal Evaluation Report (that will be available in English) and the corresponding management response, and the end-of-project review Project Board meeting. **Operational closure must happen with 3 months of posting the TE report to the UNDP ERC.** The Implementing Partner through a PSC decision will notify the UNDP Country Office when operational closure has been completed. At this time, the relevant parties will have already agreed and confirmed in writing on the arrangements for the disposal of any equipment that is still the property of UNDP.
171. Transfer or disposal of assets: In consultation with other parties of the project, UNDP is responsible for deciding on the transfer or other disposal of assets. Transfer or disposal of assets is recommended to be reviewed and endorsed by the project board following UNDP rules and regulations. In all cases of transfer, a transfer document must be prepared and kept on file. The transfer should be done before Project management Unit (team) complete their assignments.

Financial Planning and Management

172. Financial completion (closure): The project will be financially closed when the following conditions have been met: a) the project is operationally completed or has been cancelled; b) the Implementing Partner has reported all financial transactions to UNDP; c) UNDP has closed the accounts for the project; d) UNDP and the Implementing Partner have certified a final Combined Delivery Report (which serves as final budget revision).
173. The project will be financially completed **within 6 months of operational closure or after the date of cancellation**. Between operational and financial closure, the implementing partner will identify and settle all financial obligations and prepare a final expenditure report. The UNDP Country Office will send the final signed closure documents including confirmation of final cumulative expenditure and unspent balance to the UNDP-GEF Directorate for confirmation before the project will be financially closed in Atlas by the UNDP Country Office.
174. Refund to AF: Should a refund of unspent funds to the AF be necessary, this will be managed directly by the UNDP-GEF Directorate in New York. No action is required at CO level on the actual refund from UNDP project to the AF.

Total budget and workplan

9 TOTAL BUDGET AND WORKPLAN

Total Budget and Work Plan			
Atlas ⁴⁶ Proposal or Award ID:	00119794	Atlas Primary Output Project ID:	00116171
Atlas Proposal or Award Title:	Restoring Marine Ecosystem by Restoring Coral Reefs		
Atlas Business Unit	MUS10		
Atlas Primary Output Project Title	Restoring Marine Ecosystem Services by Restoring Coral Reefs to Meet a Changing Climate Future		
UNDP-GEF PIMS No.	5736		
Implementing Partner	United Nations Development Programme		

Table 2 Total budget and workplan by Component

AF Component/ Atlas Activity	Responsible Party (Atlas Implementing Agent)	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Amount Year 6 (USD)	Total (USD)	See Budget Note :
COMPONENT 1: Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius	MOIMRFS/ UNDP	62040	AF	74500	Miscellaneous Expenses	6,985	1,355	944	1,081	670	1,494	12,529	1
				72100	Contractual Services Companies	44,099	183,080	147,992	177,232	99,132	56,256	707,791	2
				72200	Equipment and furniture	393,150	-	-	-	-	-	393,150	3
				74200	Audio Visual & Print Prod Costs	13,000	15,000	-	-	-	15,000	43,000	4
				75700	Training Workshops and Confer	49,300	-	-	-	-	-	49,300	5
				72300	Materials and goods	654,349	408,775	27,725	33,725	33,200	65,200	1,222,974	6
				74700	Transport, Shipping and Handle	-	-	-	1,500	1,500	1,500	4,500	7
				71600	Travel	19,496	19,300	3,800	5,700	-	18,460	66,756	8
Total Component 1						1,180,379	627,510	180,461	219,238	134,502	157,910	2,500,000	
COMPONENT 2: Enhancement of food security and	MEECC/ SNPA/ Nsey/	62040	AF	74500	Miscellaneous Expenses	343	685	685	685	685	342	3,425	9
				72100	Contractual Services Companies	163,095	348,609	340,001	350,968	353,377	191,570	1,747,620	10

⁴⁶ See separate guidance on how to enter the TBWP into Atlas

Total budget and workplan

AF Component/ Atlas Activity	Responsible Party (Atlas Implementing Agent)	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Amount Year 6 (USD)	Total (USD)	See Budget Note :
reduction of risks from natural disasters through the restoration of degraded reefs in Seychelles	MCSS/ UNDP			72300	Materials and goods	189,929	56,671	57,369	58,099	58,860	26,603	447,531	11
				72200	Equipment and furniture	77,000	14,120	16,742	26,867	16,995	13,500	165,224	12
				75700	Training workshops and Confer	-	10,400	28,400	10,400	10,400	5,600	65,200	13
				71600	Travel	13,000	13,000	13,000	13,000	13,000	6,000	71,000	14
				Total Component 2		443,367	443,485	456,197	460,019	453,317	243,615	2,500,000	
COMPONENT 3: Knowledge management and sharing, training and sensitization to build regional capacity for sustainable reef restoration	UNDP	62040	AF	74500	Miscellaneous Expenses	12,385	6,650	9,560	6,355	860	6,130	41,940	15
				71200	International Consultants	21,730	125,320	174,590	81,730	129,730	157,730	690,830	16
				71300	Local Consultants	6,666	6,666	52,067	30,667	30,667	52,067	178,800	17
				72100	Contractual Services Companies	73,270	72,271	62,272	62,272	62,272	66,272	398,629	18
				71400	Contractual Services Individuals	80,315	120,472	75,472	120,472	120,472	75,471	592,674	19
				74100	Professional Services	5,000	5,000	5,000	5,000	5,000	5,000	30,000	20
				72300	Materials and goods	22,000	43,600	46,600	26,600	17,000	22,000	177,800	21
				72200	Equipment and furniture	14,000	-	-	-	-	-	14,000	22
				72800	Information Technology Equipment	720,000	-	-	-	-	-	720,000	23
				75700	Training Workshops and Confer	18,000	14,600	15,200	4,000	6,400	15,000	73,200	24
				74200	Audio Visual & Print Prod Costs	2,000	2,000	2,000	2,000	5,000	8,000	21,000	25
				71600	Travel	28,290	34,965	52,725	18,880	93,545	37,355	265,760	26
				74700	Transport, Shipping and handle	-	20,000	20,000	15,000	5,000	-	60,000	27
				Total Component 3		1,003,656	451,544	515,486	372,976	475,946	445,025	3,264,633	
Project Management Cost	UNDP	62040	AF	74596	Direct Project Costs	6,410	2,530	2,530	2,530	2,530	3,170	19,700	28
				71400	Contractual Services Individuals	64,962	83,765	85,361	87,037	88,796	90,644	500,565	29

Total budget and workplan

AF Component/ Atlas Activity	Responsible Party (Atlas Implementing Agent)	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Amount Year 6 (USD)	Total (USD)	See Budget Note :
				72200	Equipment and Furniture	6,000	290	290	290	290	290	7,450	30
				72800	Information Technology Equipment	5,400	292	275	275	275	275	6,792	31
				71600	Travel	114,880	43,680	43,680	43,680	43,680	43,680	333,280	32
				Total Management		197,652	130,557	132,136	133,812	135,571	138,059	867,787	
PROJECT TOTAL						2,825,054	1,653,096	1,284,280	1,186,045	1,199,336	984,609	9,132,420	

Total budget and workplan

Budget Notes

1	Miscellaneous costs for any unforeseen expenses
2	<p>i) Contractual Service of NGOs (one in Mauritius and one in Rodrigues) for:</p> <ul style="list-style-type: none"> • Carrying out stakeholder analysis in Mauritius and Rodrigues • Developing a strategic plan for self-sustaining of nurseries • Training of communities • Partnership agreement • Carrying out livelihood survey reports <p>ii) Contractual Services of NGOs (Mauritius and Rodrigues) which include:</p> <ul style="list-style-type: none"> • Boat rental (~ 20 days/year at a rate of USD 100/day) • Petrol for boat (~200 days trip/year at rate of USD 28/day trip) for Yrs. 2-4 in Mauritius and Rodrigues • Carrying out Environmental and Social Impact Assessment at each site on a yearly basis (USD 560/year). • Recruitment of 2 Site project coordinator (USD 970/month/person). (Marine Biologist or equivalent, minimum MSc Level, Rescue or Dive Master) for 60 months • Recruitment of 2 Site project assistant (USD 690/month/person) (Marine Biologist or equivalent, minimum BSc Level, Rescue or Dive Master) for 60 months • Incentive (USD24/person day) to Communities for <ul style="list-style-type: none"> ○ Manufacture (400-person days in Mauritius and 154-person days in Rodrigues) (year 2) ○ Deployment (600-person days in Mauritius and 84-person day sin in Rodrigues) (year 2) ○ Population of nurseries (800-person days in Mauritius and 154-person days in Rodrigues) (year 2) ○ Maintenance of nurseries (1500-person days/year in Mauritius and 600-person days/year in Rodrigues) from year 2 – 4. <p>iii) Recruitment of land-based nursery personnel:</p> <ul style="list-style-type: none"> • 2 Nursery men (USD 648/months/person) for 5.5 years • 1 Plant operator (USD 648/months) for 5.5 years • Population of land-based nurseries and ocean-based nurseries with donor coral fragments. <p>iv) Contractual Services of NGOs (Mauritius and Rodrigues) which include:</p> <ul style="list-style-type: none"> • Petrol for boat (~58-day trip/year at rate of USD 28/day trip) for year 3-6 for Mauritius and Rodrigues • Incentive (USD24/person day) to Communities for <ul style="list-style-type: none"> ○ Transplantation of farmed corals (750-person days/year in Mauritius and 150-person days in Rodrigues) (year 3-4). ○ Maintenance of restoration sites (600-person days/year in Mauritius and Rodrigues for year 3-6.

Total budget and workplan

3	<p>i) Acquisition of information Technology equipment for responsible parties for training of communities (laptops, software licenses, external hard drive, project, etc); diving equipment (17 sets); and snorkelling equipment (13 sets)</p> <p>ii) Cost associated with acquisition of 2 transport vehicles (including running costs) (USD 50,000 each)</p> <p>iii) Cost associated with:</p> <ul style="list-style-type: none"> • acquisition of multi spectral drone to carry out spatio-temporal study of beach profiles at restoration sites in Mauritius and Rodrigues. (USD 140,000) • Acquisition of equipment and software for current pattern analysis. (USD 90,000)
4	<p>i) Publication and printing costs for communication resources and media (newsletters, brochure, fact sheets, etc)</p> <p>ii) Cost associated with the updating and publication of the booklet on corals of Mauritius and Rodrigues Note: the inventory of corals will be done by Government of Mauritius as in-kind contribution.</p>
5	Costs associated with organisation of community/beneficiary training workshops and incentives to participants, training in advance PADI and snorkelling
6	<p>i) Cost associated with:</p> <ul style="list-style-type: none"> • acquisition of material for genetic analysis of resilient donors (USD 150,000) • air tank refill for diving (USD 5 /dive; on an average of 43 dives/year) • tank air refill for collection of coral larvae for sexual propagation of corals (5 dives / year) for 3 years • Materials and goods for collection of coral larvae (year 2-4) (USD 500 /year) • Chemicals, consumable and reagents for monitoring of sea water quality and other environmental parameters in donor and ocean-based nurseries of Mauritius and Rodrigues (USD 26,000/year) • Materials for survey and monitoring in Mauritius and Rodrigues (USD 10,000 for year 1 then USD 1,000/year) • Materials for setting up of land-based nursery at MOI (USD 210,000) • Material for setting up of land-based nursery (experimental) for sexual propagation of corals (USD 56,099). • Materials for setting up multi rope nurseries (200 in Mauritius and 40 in Rodrigues) (USD 900/nursery) • Materials for setting up of table nurseries (100 in Mauritius and 50 in Rodrigues) (USD 1100/ nursery) <p>ii) Cost associated with:</p> <ul style="list-style-type: none"> • acquisition of 2 pneumatic drills (USD 10,000 each); • consumables for water analysis (USD 1,000 for year 4-6) • materials and logistics for monitoring survey in BBMP and SEMP (USD 5,000/ year for year 4-6) • materials and goods to carry out current temporal study (USD 150,000). • Logistics and consumables for current pattern survey and beach monitoring in Mauritius and Rodrigues (USD 32,000 / year in year 1 and year 6)

Total budget and workplan

7	Cost associated with shipping of water samples from Rodrigues for analysis.
8	<p>i) Cost for trip to Rodrigues for resource persons from (1) AFRC and (1) MOI for community training in Rodrigues (3 days). (cost of trip= USD 250/person; DSA= USD 136/day):</p> <p>ii) Cost for trip in Rodrigues (cost of trip= USD 250/person; DSA= USD 140/day):</p> <ul style="list-style-type: none"> • Year 1: 4 persons (2 MOI and 2 AFRC) for 7 days to carry out survey to identify donor sites in Rodrigues • Year 2: 4 persons (2 MOI and 2 AFRC) for 9 days for the collection of donor species from donor sites for asexual propagation in ocean-based nurseries and to carry out monitoring of donor and ocean-based nurseries (sea water quality and other key environmental parameters) • Year 2: 2 persons (1 MOI and 1 AFRC) for 14 days for identification of ocean-based nursery sites and restoration sites in Rodrigues. • Year 2: 4 persons (2 MOI and 2 AFRC) for 14 days to oversee the manufacture, deployment and population of nurseries in Rodrigues • Year 2: DSA for 2 persons (MOI and AFRC) for 4 days for training on monitoring in Rodrigues <p>iii) Cost for trip in Rodrigues (cost of trip= USD 250/person; DSA= USD 140/day):</p> <ul style="list-style-type: none"> • Year 3: 4 persons (2 MOI and 2 AFRC) for 5 days to carry out survey to identify donor sites in Rodrigues • Year 4: 6 persons (3 MOI and 3 AFRC) for 5 days for monitoring of restored coral reef site in Rodrigues • Year 6: 4 persons (2 MOI and 2 AFRC) for 7 days for monitoring of restored coral reef site in Rodrigues • Year 1 and 6: 6 persons (5 MOI and 1 AFRC) for 14 days for spatio temporal study in Rodrigues
9	Miscellaneous costs for any unforeseen expenses

Total budget and workplan

10	<p>i) Cost associated with:</p> <ul style="list-style-type: none"> • Development of Business Plan (Nsey) and Strategic/Financial Plan (SNPA) • Carrying out a livelihood survey. <p>ii) Cost associated with allowance of project staff for:</p> <ol style="list-style-type: none"> a) technical assessment and selection of coral species for transplantation b) identification of donor sites c) collection of donor corals d) identification of ocean-based nursery sites e) monitoring of water quality of donor and sea nurseries f) maintenance of ocean-based nurseries <p>Note: Allowance of project staff for each responsible party in Seychelles are as follows:</p> <ul style="list-style-type: none"> • MCSS (USD 3000/month) • Nsey – Project site coordinator (USD 3355/months), Science/Technical Officer (USD2706/month) and Dive officer (USD 1082/month) • SNPA – Project site coordinator (USD 12000/months) and 3 project staff (USD 780/person/month) and interisland ferry fare allowance (USD 60/trip; 72 trip /year) <p>iii) Cost associated with operation of ocean-based nurseries (staff house, PC house) (Nsey)</p> <p>iv) Cost for maintenance of land nurseries (Nsey)</p> <p>v) Cost associated with:</p> <ul style="list-style-type: none"> • allowance of project staff of MCSS for transplantation of ocean-based nursery corals (3 months/year for year 1-6) • incentives for 2 volunteers (Mauritius exchange) (USD 500/months) for 6 months and housing of the volunteers (USD 2,000/year) for year 1-5 • monitoring of health and diversity of corals, fish and other fauna and flora of the restored sites: <ul style="list-style-type: none"> ○ Anse Forbans for 5 years ○ Curieuse Island: Project Site Coordinator and 3 project staffs for 5 years ○ Cousin Island: 4 divers (2 from Mauritius and 2 international) x 4 cycles of 3 months each = 8 divers/year at an estimated rate of USD 1541/person/month • Monitoring and maintenance of restoration sites for 5 years: <ul style="list-style-type: none"> ○ Anse Forbans ○ Curieuse Island: Project Site Coordinator and 3 project staffs ○ Cousin Island: stipends for 4 student volunteers (USD2346/year) and housing (USD 2,000/year) (year 2-5)
11	<p>i) Costs associated with:</p> <ul style="list-style-type: none"> • Material for monitoring of donor coral reef and nurseries (USD 1000/year for SNPA) for year 2-6

Total budget and workplan

	<ul style="list-style-type: none"> • Data top up for SNPA (~USD 264/year) • Materials for land-based nursery (USD 130,000) for Nsey • Materials for setting up and operation of ocean-based nurseries: <ul style="list-style-type: none"> ○ Ste Anne/le aux Cerfs – (USD 7000 /year) ○ Cousin Island (on average USD 3000 / year) and cost for petrol for 5 years (~USD 3600/year) ○ Curieuse Island (~USD 30,000/year) ○ Anse Forbans (~USD 7,000/year) <p>ii) Cost associated with material for transplantation of ocean-based corals: Anse Forbans (USD 5,000/year for year 2-6)</p> <ul style="list-style-type: none"> • Curieuse: petrol for boat (USD 1,440/year) and consumables (USD 960/year)
12	<p>i) Transport Vehicle for MCSS</p> <p>ii) Equipment for collection of donor corals for MCSS</p> <p>iii) Cost associated for purchasing of equipment by Nsey as follows:</p> <ul style="list-style-type: none"> • Dive equipment (USD 6000/year) • New Boat engine (USD 4,000) • Dissecting scope with lights (USD 2,500) <p>iv) Cost associated with diving equipment, including maintenance (USD 8,000/year); and dive compressor (USD 12,000) for SNPA</p>
13	<p>Cost associated with:</p> <ul style="list-style-type: none"> • Training of communities and NGO on establishing and maintaining coral nurseries • Awareness campaign on coral restoration in Seychelles • Scuba training of students (Nature Seychelles only)
14	<p>i) Return ticket for the 4 project staffs of Nature Seychelles (USD 1,500/ticket per project staff)</p> <p>ii) Cost associated with air ticket for:</p> <ul style="list-style-type: none"> • 2 volunteers from Mauritius (USD 500/year/person) for Curieuse Island for 5 years • Air tickets for volunteer divers for Cousin Island (2 international divers x 4 cycles of 3 months each = 8 divers/year) (USD 1000/diver) • Air tickets for volunteer divers for Cousin Island (2 Mauritian divers x 4 cycles of 3 months each = 8 divers/year) (USD 500/diver)
15	Miscellaneous costs for any unforeseen expenses

Total budget and workplan

16	<p>i) Cost of contractual appointment of international consultants (including air tickets and DSA):</p> <p>a) Chief Technical Advisor (USD 800/person days) for:</p> <ul style="list-style-type: none"> • Comprehensive review of coral reef restoration in the region and globally (40-person days) • Reef restoration methodologies, concept and best practices guidelines (40-person days) • Oversee implementation of Component 1, 2 and 3 (60-person days) • Air ticket and DSA for Mauritius, Rodrigues and Seychelles (USD 6,730) <p>b) Expert in coral sexual reproduction and genetics (USD 800/person days)</p> <ul style="list-style-type: none"> • Assist in the genetic connectivity study, sexual reproduction of corals and study on clade analysis of resistant/resilient coral species in Mauritius, Rodrigues and Seychelles (140-person days) • Air ticket and DSA for Mauritius (13 days) (USD 4,860) <p>ii) Part of cost of contractual appointment of CTA for the review/updating of the coral restoration toolkit/manual (30-person days at rate of USD 800/person days)</p> <p>iii) Part of cost of contractual appointment of:</p> <ul style="list-style-type: none"> • CTA for training in micro-fragmentation (USD4000) • CTA for development of a Regional/National Coral Reef restoration plan (40-person days at rate USD 700/person days) • Expert in coral sexual reproduction and genetics for training in genetic analysis (15-person days at rate of USD 700/person days) including travel and DSA (USD 4860) • International expert in policy and legal, technical expert and financial expert for coral reef restoration plan (USD 700/person days for 72-person days/expert) and travel (USD 10,300) <p>iv) Cost of contractual appointment of:</p> <ul style="list-style-type: none"> • Independent International M& E consultant (USD 50,000) • Travel cost of CTA to Mauritius, Rodrigues and Seychelles (USD 82,300) <p>v) International consultants for Mid Term Review/MTR (45,000) and Terminal Evaluation/TE (45,000)</p>
17	<ul style="list-style-type: none"> • Cost of contractual appointment of 2 local expert in policy/legal for development of a Regional/National coral reef restoration plan (USD 400/person days/expert for 120-person days/expert) including cost for air ticket to Mauritius and Seychelles (USD 700/trip/person) for 2 trips each. • Cost of contractual appointment of: • 2 national Gender and M&E consultants (USD 40,000) one for Mauritius and one for Seychelles (3 weeks/year, including air ticket and DSA for Rodrigues and ferry fare for Praslin)

Total budget and workplan

18	<p>i) Contract out services for design and printing of guideline to coral restoration document</p> <p>ii) Cost of contractual appointment of:</p> <ul style="list-style-type: none"> • Website manager for hosting and monthly maintenance of the website (USD 25,000) • Company for documentary film development (USD 235,629) • Design, printing and publishing of coral restoration. toolkit/manual (NOTE: same contractual appointment for designing, printing and publishing works for Components 1,2 and 3) (USD 5,000) <p>iii) Cost for contractual appointment to carry out biannual beach profiling (USD 120000) and GIS mapping (USD 8000) for Seychelles</p>
19	Part of Cost of contractual appointment of regional project manager
20	Cost for professional services for annual audit as per UNDP audit policies (USD 5,000/year)
21	<p>i) Cost associated with acquisition of materials and goods for:</p> <ul style="list-style-type: none"> • Laboratory supplies for genetic connectivity analysis (USD 9600/year for yrs. 2-4) • Laboratory supplies for carrying out studies on identification of resilient coral species (USD 42,000) <p>ii) Cost for acquisition of material for:</p> <ul style="list-style-type: none"> • Genetic connectivity/clade analysis training (USD 5000) • Micro-fragmentation training (USD 2000) • Logistics for field surveys (GIS) in Mauritius and Rodrigues for yrs. 1 and 6 (USD 4000/year for Mauritius and Rodrigues each) • Consumables and logistics for biannual beach profiling in Mauritius and Rodrigues (USD 84,000)
22	Equipment for genetic connectivity study.
23	<p>Cost for the acquisition of:</p> <ul style="list-style-type: none"> • Equipment (6 ADCP, 5WTR, 2 ECM) for collection of current pattern data (USD 600,000) • Equipment and Software for GIS (including workstation, GIS license (x3) map printing, MATLAB Licence (x3) (USD 90,000) • Software licences for spacio-temporal beach profiling (USD 30,000)

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24	<p>i) Cost for the organisation of workshop/training in relation to reef restoration methodologies, concept and best practices guidelines</p> <p>ii) Cost associated for the venue of RSAC meeting (USD 1000/meeting)</p> <p>iii) Cost associated with catering of 20 participants for:</p> <ul style="list-style-type: none"> • genetic connectivity, clade analysis regional training for 5 days (USD 6800) • micro-fragmentation for 4 days (USD 5,600) • Venue for training workshop, one for Mauritius and one for Seychelles (USD 3000/venue) • training of personnel of Seychelles (20) and Rodrigues (20) in current pattern study (USD 70/participant) <p>iv) Cost for the Organisation (venue and catering) of:</p> <ul style="list-style-type: none"> • Project Steering Committees (USD 4,000/per meeting, 2 in yr1 and 6, 1 meeting/year for yrs. 2-5, alternating Mauritius and Seychelles) • Inception and completion workshops (USD 14,000)
25	<p>Cost associated with access to publications (scientific journals) and for the publication in journals of the following:</p> <ul style="list-style-type: none"> • Comprehensive review of coral reef restoration techniques in the region and globally (USD 3,000) • Genetic connectivity study (USD 2,000/year) • Study on resistant/resilient species and clades analysis of thermos resistant species in Mauritius, Rodrigues and Seychelles. (USD 6,000)
26	<p>i) Cost for trip in Seychelles (cost of trip= USD 700/person; DSA= USD 305/day):</p> <ul style="list-style-type: none"> • Year 2: 1 persons (MOI) for 3 days to take samples for genetic connectivity and build capacity of Seychelles to take sample and proper packaging for shipment to Mauritius. <p>ii) Cost associated with travel (air ticket and DSA) for:</p> <ul style="list-style-type: none"> • Participation in relevant international forum for 2 participants from Mauritius, 1 from Rodrigues and 3 from Seychelles • Coral experts from the region to attend RSAC meeting and exchange programme: 2 Rodrigues (USD 250); Australia (USD 2000); Madagascar (USD 600); Maldives (USD 600); South Africa (USD 850); Sri Lanka (USD 900); and Thailand (USD 1200), 4Mauritius (to Seychelles @USD700/person/trip). DSA for 2 days for meeting in Mauritius (USD 220) and in Seychelles (USD 305) <p>iii) Cost associated with travel for regional training in:</p> <p>a) Genetic connectivity, clade analysis (5 days training, DSA- USD 220/day):</p> <ul style="list-style-type: none"> • 3 participants from Seychelles (USD 700/trip/person) • 2 participants from Rodrigues (USD 250) • Coral experts from the region: Australia (USD 2000); Madagascar (USD 600); Maldives (USD 600); South Africa (USD 850); Sri Lanka (USD 900); and Thailand (USD 1200). <p>b) Regional training on micro-fragmentation (6 days, DSA= USD 305/day)</p>

Total budget and workplan

	<ul style="list-style-type: none"> • 4 participants from Mauritius (2 MOI and 2 AFRC) (USD 700/trip/person) • 1 participant from Rodrigues (USD 950 USD/trip/person) <p>c) Regional/National Coral Reef Restoration Plan (2 workshops)</p> <ul style="list-style-type: none"> • 1 participant from Rodrigues (USD 250/trip/person to Mauritius, USD 950/trip /person to Seychelles) • 4 participants from Seychelles to Mauritius (USD 700/trip/person, DSA= USD 220/day/person for 3 days) • 4 participants from Mauritius to Seychelles (USD 700/trip /person, DSA= USD 305/day/person for 3 days) <p>d) Current pattern (installation and removal of equipment):</p> <ul style="list-style-type: none"> • 3 technicians from Mauritius to Seychelles in year 5 and 6 (USD 700/trip/person, DSA=USD 305/person/day for 7 days/year) • 3 technicals from Mauritius to Rodrigues in year 3 and 4 (USD 250/trip/person, DSA= USD 140/day/person for 3 days) • Boat rental in Mauritius and Rodrigues (USD3,600) • Ferry allowance of USD 60/person/trip for 8 persons in year 5 and 6 <p>e) Beach profiling twice per year in Rodrigues</p> <ul style="list-style-type: none"> • 3 technicians from Mauritius (2 MOI and 1 AFRC) (USD 250 / trip/person, DSA= USD 140/day/person for 6 days) for 5 years <p>iv) Cost associated with travel of 6 participants from Seychelles 6 participants from Mauritius (1 from Rodrigues) to travel for PSC meeting, outside their country. Air ticket (MUR-SEZ): USD 700/trip/participant, USD 250 for participant from Rodrigues, DSA in Mauritius = USD 220/day/participant, DSA in Seychelles = USD 305/day/participants</p>
27	<p>Cost associated with shipping of sample material for:</p> <ul style="list-style-type: none"> • Genetic connectivity analysis from Rodrigues and Seychelles (USD 5000/shipping, once per year during year 2-4) • Clade analysis from Seychelles (USD 5000/shipping, once per year during yrs. 2-5) • Clade analysis from Rodrigues (USD 5,000 /shipping, once per year during yrs. 2 and 3)
28	<p>Cost associated with services provided by UNDP CO Mauritius for activities such as procurement of goods, recruitment of project personnel and organisation of travels and per diem for resource persons, any unforeseen expenses etc.</p>
29	<p>Cost of contractual appointment of Regional Project Manager (part)P2, Project Assistant (USD1900/month) and Financial Assistant (USD 1900).</p>
30	<p>Acquisition of 2 diving sets and maintenance</p>

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31	Acquisition of IT equipment (laptops, external hard drive, digital camera etc.) for Regional Project Manager, Project Assistant and Financial Assistant.
32	Cost for the travel of Regional Project Manager and Project or Financial Assistant in Seychelles (USD 700/trip/person, DSA: USD 305/day/person) and Rodrigues (USD 250/trip/person, DSA = USD 140/day/person), 4 trips per year. 1 st trip in Yr 1 for a duration of 21 days, other trips duration = 10 days.

10 GOVERNANCE AND MANAGEMENT ARRANGEMENTS

10.1 Project Management

Implementing Partner

175. The project will be implemented over a period of six years (72 months). Since there are no accredited National Implementing Entities (NIEs) to the Adaptation Fund (AF) in the target countries, the project will be implemented by the **United Nations Development Programme (UNDP)**, which is accredited as AF Multilateral Implementing Entity (MIE). UNDP will assure the administrative and financial management of the project. The following implementation services under the Direct Implementation Modality (DIM) will be provided by UNDP for the proposed project:

- coordinating and managing the overall implementation of project outcomes and activities;
- facilitating of interactions with the AF Board and related stakeholders;
- accountability of the project implementation and reporting on budget performance;
- quality assurance and accountability for outputs and deliverables at the project development phase, during implementation and on completion;
- information and communication management, including maintaining Information Management Systems and specific project databases to track and monitor progress – financial and substantive – of project implementation;
- regional knowledge management, communications and awareness raising;
- disbursing funds to the Responsible Parties for the implementation of on-the-ground activities within those countries;
- providing technical oversight to all activities carried out by the Responsible Parties; and
- managing centralised procurement of goods and services for the project.

176. The UNDP will be collaborating with the Executing Entities MOEMRFS in Mauritius and MEECC in Seychelles, who will act as Responsible Parties to carry out activities within the DIM Project. They will have to report progress to the Regional

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Project Manager and the Project Steering Committee. In the case of Seychelles, Activity Partners will carry out project activities on behalf of the Responsible Party.

177. In terms of project management, there will be three levels of implementation, i.e. Regional, National and local. The project organogram is shown in fig 4.

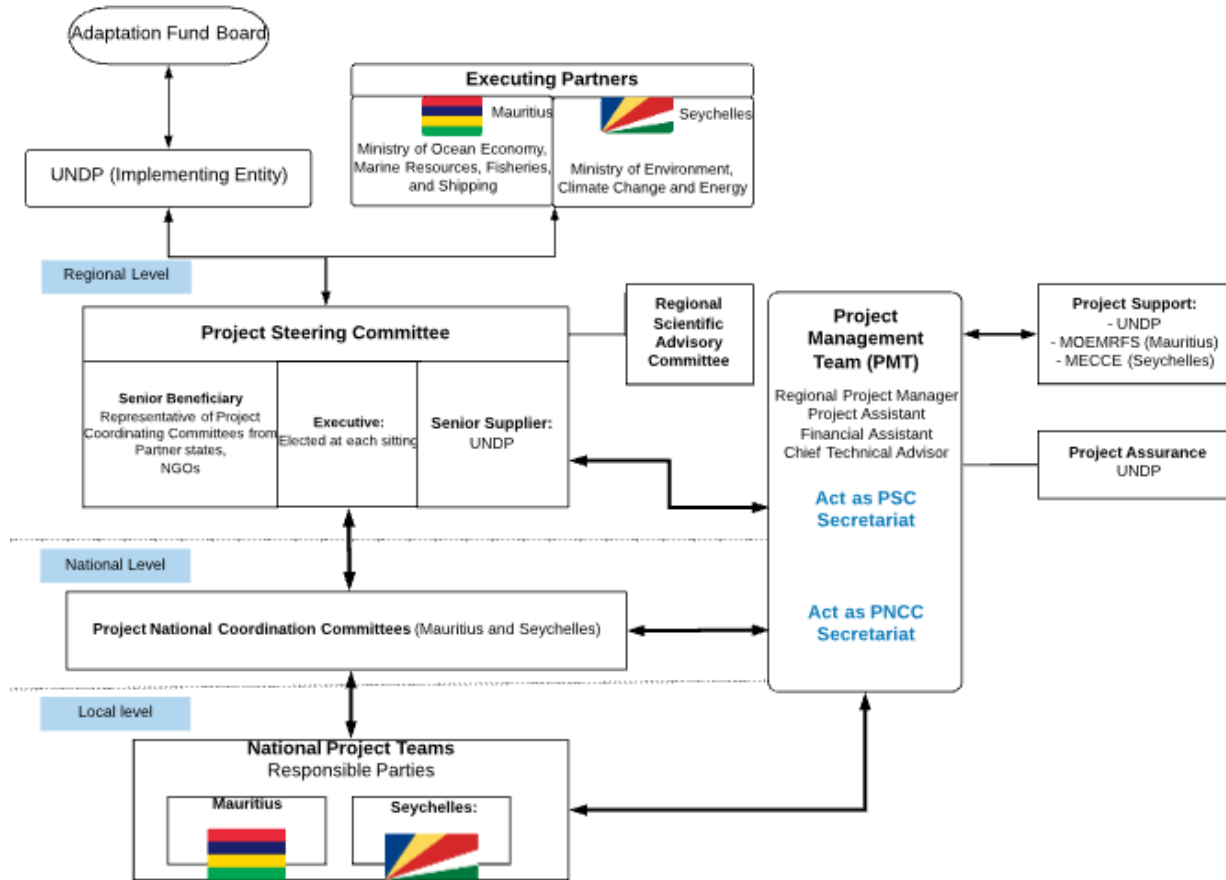


Figure 4: Project Organogram

Governance and Management Arrangements

Responsible Party

178. The Responsible Party for the Republic of Mauritius will be the **Ministry of Blue Economy, Marine Resources, Fisheries, and Shipping (MBEMRFS)**, which has the mandate to provide an enabling environment for the promotion of sustainable development of the fisheries sector and is responsible for the management of coastal waters and any related activities being carried out within these, and specifically the following bodies under this Ministry:

- **Albion Fisheries Research Centre (AFRC)** was established in 1982 under the MBEMRFS (then MBEMRFS), and responsible for stock assessment of marine resources, MPA management, ocean-based coral farming/restoration and long-term coral reef monitoring, will lead on the development of ocean-based coral nurseries, with support from Mauritius Oceanography Institute.
- **Mauritius Oceanography Institute (MOI)** was established in 2000 to develop and strengthen oceanographic research, within the maritime zone of the Republic of Mauritius, with technical expertise and institutional capacity for both coral farming, species identification and coral genetics. MOI will lead on research activities in the project, and the development of a land-based coral nursery.

179. To assist the Responsible Party in the implementation of the project at the community/local level, UNDP will recruit one NGO in Mauritius and one in Rodrigues.

180. The Responsible Party for the Republic of Seychelles will be the **Ministry of Environment, Climate Change and Energy (MEECC)**, which has the mandate for environmental, climate change and energy policy and management.

181. In Republic of Seychelles, the following organisation will act as the Activity Partners:

- **Seychelles National Parks Authority (SNPA)**, which is a government organisation under the aegis of MEECC, is responsible for the management of all state owned terrestrial and marine protected areas. SNPA will build on its existing coral reef restoration work and benefit from opportunities for further training for its staff and permit staff retention (from EBA project) as well as integration in the organisation at the end of the FB project.
- **Nature Seychelles (NSey)**, an NGO that has pioneered terrestrial restoration of islands, and has been the recipient of GEF-funds and other large donor funded projects. NSey manages the Cousin Island Special Reserve, the site of a 5,500 m² restored reef, and will build on its previous large-scale coral reef restoration experience (up to 25,000 nursery-grown corals transplanted). NSey is registered as a Private Educational and Training Institute (under the Education Act);
- **Marine Conservation Society of Seychelles (MCSS)** is an NGO, which promotes the conservation of the marine environment through education, research and the implementation of a number of programmes. MCSS has participated in several marine ecosystem management programmes and supported projects on coral predators.

Project Management Team (PMT)

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182. UNDP, as MIE for this project, will recruit and establish a Project Management Team (PMT) to be led by a Regional Project Manager (RPM). He will be supported by a Project Assistant (PA) and a Financial Assistant (FA) and technically supported by a Chief Technical Advisor (CTA). The PMU will be accountable to UNDP and the PSC for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. Moreover, the PMU will have the following responsibilities:

- i. Facilitate the coordination of the overall project implementation at the different (regional, national and local/city) levels, including supervision, oversight and backstopping of the various Responsible Parties;
- ii. Act as Secretariat of the Project Steering Committee (PSC), to which it will submit annual work plans for review and approval, as well as annual narrative reports (see also Section 10 on reporting requirements);
- iii. Produce progress reports and financial reports every 3 months
- iv. Produce Annual Project Progress Reports every 12 months to be submitted to the donor (Adaptation Fund);
- v. Ensure budgeting and financial management, with the support of UNDP administration;
- vi. Prepare and manage all contractual agreements with the national/international consultants, including terms of reference, work plans, budgets and payment schedules, and perform payments upon progress, as per UNDP procedures;
- vii. Carry out regular project monitoring at all levels (regional, national and local/project site level), ensuring compliance and quality control in accordance with UNDP and AF standards and requirements;
- viii. Organise the mid-term review and the independent terminal project evaluation;
- ix. Organise duty travel, seminars, public outreach activities and other project events
 - x. Carry out Environmental and Social Impact Monitoring as per Environmental and Social Risk Monitoring Plan (Part III, Section C of Project Proposal (Annex U))
- xi. Coordinate overall knowledge management and project communication.
- xii. Handle any grievance received and respond accordingly, as per the stakeholder Response Mechanism of UNDP described Annex J.

183. The terms of reference of the RPM, PA, FA and FTA have been described in Annex C.

Project Steering committee

184. A **Project Steering Committee (PSC)** is the overall decision-making body in terms of project coordination and orientations and provide strategic guidance on project implementation issues. It will meet at least once a year at the regional level and will have the following responsibilities:

- i. Review, discuss and provide substantive comments and main recommendations to the annual progress reports prepared and presented by the PMU during the annual PSC meetings;
- ii. Review, discuss and approve the annual work plans, procurement plans and budget submitted by the PMU;

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- iii. Define the main strategies and provide overall policy guidance, recommendations and orientations for project implementation and coordination throughout the implementation period.
- iv. Ensure policy conformity of the project activities in each country and policy mainstreaming, as required, of project activities to ensure the sustainability of the project results beyond the project implementation period.
- v. Ensure that co-financing will be realized through effective consultation and partnership;
- vi. Ensure that the project will make positive impacts on gender mainstreaming as much as possible.

185. The PSC will be composed of senior representatives of the Project National Coordination Committee of each country and UNDP. A representative of the Regional Scientific Advisory Committee (RSAC) will be co-opted. The Chairperson will be elected at each seating. The RPM will act as Secretariat to the PSC.

186. In case consensus cannot be reached within the Project Steering Committee/Board, the UNDP Resident Representative (or their designate) will mediate to find consensus and, if this cannot be found, will take the final decision to ensure project implementation is not unduly delayed.

Project National Coordination Committee (PNCC)

187. In each target country, a Project National Coordination Committee (PNCC) will be set up, which will meet at least quarterly to discuss the status of the project implementation at the national level and provide guidance and recommendations for the next 3 months. It will also act as an immediate grievance mechanism and provide response and direction accordingly. The RPM will act as the Secretariat of the PNCC. The PNCC will report to the PSC. The PNCC may be able to make decisions on matters delegated by the PSC as and when appropriate.

188. The highest authority of the Responsible Parties (i.e. MBEMRFS for Mauritius and MEECC for Seychelles) will chair their respective PNCCs. The PNCC will be gender-balanced and will be composed of the principal stakeholders for each country, and will include representatives from the Responsible Parties, the Activity Partners, other relevant Ministries, UNDP, NGOs, Private Sector, Civil Societies, Accademia and other relevant stakeholders. The PNCC representation and terms of reference will be finalized in the Project Inception Workshop (IW). The TOR of the PNCC is at Annex C.

Regional Scientific Advisory Committee (RSAC)

189. A Regional Scientific Advisory Committee will be established composed of relevant scientists from each target country and including recognised international and regional coral reef restoration experts (i.e. Australia, Madagascar, Maldives, South

Monitoring and Evaluation (M&E)

Africa, Sri Lanka and Thailand). As mentioned in Section 5.1 “Expected Results - Component 3”, the project will look into the possibility for the Coral Specialist Group, hosted by the Coastal Oceans Research and Development in Indian Ocean (CORDIO), to act as the Regional Scientific Advisory Committee. As such a member of the Coral Specialist Group will be co-opted as member of the Project Steering Committee.

190. Existing regional bodies and platforms will be used where appropriate to ensure that activities undertaken through the project are appropriately co-ordinated and communicated at the regional level. These will include the Indian Ocean Commission, WIOMSA, the proposed WIO coral reef network, CORDIO and the various committees and co-ordinating bodies under the Nairobi Convention. The RSAC will meet virtually every year. However, the RSAC will meet at least once during the course of the project, as back to back meeting with the PSC. The terms of reference of the RSAC is at Annex C.
191. Project Assurance: UNDP performs the quality assurance and supports the Project Board and Project Management Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. UNDP provides a three - tier oversight services involving the UNDP Country Offices and UNDP at regional and headquarters levels. Project assurance is totally independent of the Project Management function.
192. Project extensions: The UNDP-GEF Executive Coordinator must approve all project extension requests. Note that all extensions incur costs and the AF project budget cannot be increased. A single extension may be granted on an exceptional basis and only if the following conditions are met: one extension only for a project for a maximum of six months; the project management costs during the extension period must remain within the originally approved amount, and any increase in PMC costs will be covered by non-AF resources; the UNDP Country Office oversight costs during the extension period must be covered by non-AF resources.
193. Direct Project Costs - which will include the costs of any activities over and above the project cycle management services for which UNDP receives a fee - may only be charged to the project budget upon the specific request of, and agreement with, the Implementing Partner. These costs are not mandatory, and according to the Adaptation Fund Board these costs should not be considered routine or normal, but instead provided only on an exceptional basis.

11 MONITORING AND EVALUATION (M&E)

194. The monitoring and evaluation (M&E) scheme will be applied in accordance with the established UNDP procedures throughout the project lifetime. The Responsible Parties, together with the UNDP Mauritius/Seychelles will ensure the timeliness and quality of the project implementation. The M&E plan will be implemented as proposed in the table 4 below.

Monitoring and Evaluation (M&E)

Technical guidance and oversight will be also provided from the UNDP's Regional Service Centre in Addis Ababa as well as the PSC. Audits on the project will follow UNDP finance regulations and rules and applicable audit policies.

195. The Results Framework noted in Section 7 (Table 2) provides performance and impact indicators for project implementation along with their corresponding means of verification. The monitoring plan is at Annex A. These will form the basis on which the project's Monitoring and Evaluation system will be built throughout the 6-year implementation period.

196. The principle components of the Monitoring and Evaluation Plan will include: (1) establishing monitoring responsibilities and events, (2) project reporting and (3) independent evaluations. The project's Monitoring and Evaluation Plan will be presented and finalized at the Project's Inception Phase following a collective fine-tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities

Project Start

197. A *Project Inception Workshop* (IW) will be held within the first 3 months of project start with those with assigned roles in the project management, UNDP CO and where appropriate/feasible, regional technical advisors as well as other stakeholders. The IW is crucial to building ownership for the project results and to plan the first-year annual work plan.

198. The **Inception Workshop** should address a number of key issues including:

- Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and Regional Coordinating Unit (RCU) staff (i.e. UNDP Mauritius/Seychelles and CTA) vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- Based on the project results framework, to finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- Provide a detailed overview of reporting, monitoring and evaluation requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- Discuss financial reporting procedures and obligations, and arrangements for annual audit. Audits on the project will follow UNDP finance regulations and rules and applicable audit policies.
- Plan and schedule Project Steering Committee and Project Coordination Committee meetings. Roles and responsibilities of all project organization structures should be clarified and meetings planned. The first Project Steering Committee meeting should be held within the 12 months following the inception workshop.

Monitoring and Evaluation (M&E)

199. An Inception Workshop Report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS.
- Based on the information recorded in ATLAS, an Annual Project Progress Report (PPR) can be generated in the Executive Snapshot;
- Other ATLAS logs will be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.
- Evaluation of the Environment and Social Impact Assessment monitoring.

Annually

200. An **Annual Project Progress Report (PPR)** will be prepared by the Regional Project Manager, shared with the PSC. The PPR will evaluate yearly project progress, using identified M&E indicators. The PPR will identify yearly objectives and targets, lessons learned and risk mitigation measures, as well as relevant financial information. The data for monitoring will consist of financial, procurement and physical progress reports as well as compliance with the requirements of the environmental and social assessment and management frameworks, along with financial audit reports. It will also include measures considered in the risk management plans proposed in Section 6.2.

Project Reporting

201. **Periodic monitoring through site visits:** UNDP Mauritius/Seychelles and PMU and Chief Technical Advisor will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first-hand project progress. Other members of the PSC and PCC may also join these visits. A Field Visit Report/BTOR will be prepared by the PMU and will be circulated no less than one month after the visit of the project team to and PSC and PCC members.

202. **Mid-term of the project cycle:** The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation (beginning-year 4). The MTE will determine progress being made toward the achievement of outcomes, assess financial, social and environmental risks and pinpoint corrective actions as required. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. The findings of this evaluation will be incorporated as recommendations for enhanced implementation during the final half of the project's term.

Monitoring and Evaluation (M&E)

203. **Project Closure:** An independent Final Evaluation will be undertaken 3 months prior to the final RSC meeting (prior to project closure) and will be undertaken in accordance with UNDP guidance. The Final Evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO. The Final Evaluation should also provide recommendations for follow-up activities and will require a management response, which will be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Centre (ERC).

Learning and knowledge sharing

204. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

205. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

206. There will be a two-way flow of information between this project and other projects of a similar focus.

207. Agreement on intellectual property rights and use of logo on the project's deliverables and disclosure of information: To accord proper acknowledgement to the AF for providing grant funding, the AF logo will appear together with the UNDP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the AF will also accord proper acknowledgement to the AF. Information will be disclosed in accordance with relevant policies notably the UNDP Disclosure Policy and the AF policy on public involvement.

Monitoring and Evaluation Budget

Table 3 Indicative Project Monitoring and Evaluation Workplan and budget

Type of M&E activity	Responsible Parties	Budget USD	Time frame
Inception Workshop and Report	<ul style="list-style-type: none"> ▪ PMU ▪ UNDP CO 	10,000	Within first three months of project start up
Measurement of Means of Verification of project results	UNDP RTA/Programme Manager will oversee the hiring (specific studies and	N.A	Start, mid- and end of programme (during

Monitoring and Evaluation (M&E)

Type of M&E activity	Responsible Parties	Budget USD	Time frame
	institutions), and delegate responsibilities to relevant team members.		evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation	Oversight by Regional Project Manager PMU National Project team	N. A	Annually prior to PPR and to the definition of annual work plans
PPR	<ul style="list-style-type: none"> ▪ PMU ▪ UNDP CO ▪ UNDP RTA 	None	Annually
Periodic status/ progress reports	<ul style="list-style-type: none"> ▪ PMU 	None	Quarterly/ Annually
Mid-term Evaluation	<ul style="list-style-type: none"> ▪ PMU ▪ UNDP CO ▪ UNDP RTA ▪ External Consultants (i.e. evaluation team) 	45,000	Year 4, A the mid-point of the project implementation.
Final Evaluation	<ul style="list-style-type: none"> ▪ PMU, ▪ UNDP CO ▪ External Consultants (i.e. evaluation team) 	45,000	Year 6, at least three months before the end of project implementation
NEX Audit	<ul style="list-style-type: none"> ▪ UNDP CO ▪ PMU 	30,000	As per UNDP regulations
Visits to field sites	<ul style="list-style-type: none"> ▪ UNDP CO ▪ Government representatives ▪ PMU ▪ PSC ▪ CTA 	20,000	Yearly
TOTAL indicative COST		150,000	

Note:

1. The costs indicated here do not include the costs associated with UNDP staff. Those UNDP related costs are covered by the MIE fee.
2. The budget for M&E activities are included in the project budget component found in Section 9.

12 LEGAL CONTEXT

208. This project forms part of an overall programmatic framework under which several separate associated country level activities will be implemented. When assistance and support services are provided from this Project to the associated country level activities, this document shall be the “Project Document” instrument referred to in: (i) the respective signed SBAs for the specific countries; or (ii) in the [Supplemental Provisions to the Project Document](#) attached to the Project Document in cases where the recipient country has not signed an SBA with UNDP, attached hereto and forming an integral part hereof. All references in the SBA to “Executing Agency” shall be deemed to refer to “Implementing Partner.”
209. This project will be implemented by UNDP Mauritius Country Office (“Implementing Partner”) in accordance with its financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. Where the financial governance of an Implementing Partner does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition, the financial governance of UNDP shall apply.
210. The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

13 RISK MANAGEMENT

211. UNDP as the Implementing Partner will comply with the policies, procedures and practices of the United Nations Security Management System (UNSMS.)
212. UNDP as the Implementing Partner will undertake all reasonable efforts to ensure that none of the [project funds] [UNDP funds received pursuant to the Project Document] are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/sc/committees/1267/aq_sanctions_list.shtml. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.
213. Social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (<http://www.undp.org/ses>) and related Accountability Mechanism (<http://www.undp.org/secu-srm>).
214. UNDP as the Implementing Partner will: (a) conduct project and programme-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the project or programme to comply with such

Risk Management

standards, and (c) engage in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.

215. In the implementation of the activities under this Project Document, UNDP as the Implementing Partner will handle any sexual exploitation and abuse ("SEA") and sexual harassment ("SH") allegations in accordance with its regulations, rules, policies and procedures.

216. All signatories to the Project Document shall cooperate in good faith with any exercise to evaluate any programme or project-related commitments or compliance with the UNDP Social and Environmental Standards. This includes providing access to project sites, relevant personnel, information, and documentation.

217. UNDP as the Implementing Partner will ensure that the following obligations are binding on each responsible party, subcontractor and sub-recipient:

a) Consistent with the Article III of the SBAA [or the Supplemental Provisions to the Project Document], the responsibility for the safety and security of each responsible party, subcontractor and sub-recipient and its personnel and property, and of UNDP's property in such responsible party's, subcontractor's and sub-recipient's custody, rests with such responsible party, subcontractor and sub-recipient. To this end, each responsible party, subcontractor and sub-recipient shall:

i) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;

ii) assume all risks and liabilities related to such responsible party's, subcontractor's and sub-recipient's security, and the full implementation of the security plan.

b) UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the responsible party's, subcontractor's and sub-recipient's obligations under this Project Document.

c) In the performance of the activities under this Project, UNDP as the Implementing Partner shall ensure, with respect to the activities of any of its responsible parties, sub-recipients and other entities engaged under the Project, either as contractors or subcontractors, their personnel and any individuals performing services for them, that those entities have in place adequate and proper procedures, processes and policies to prevent and/or address SEA and SH.

d) Each responsible party, subcontractor and sub-recipient will take appropriate steps to prevent misuse of funds, fraud or corruption, by its officials, consultants, subcontractors and sub-recipients in implementing the project or programme or using the UNDP funds. It will ensure that its financial management, anti-corruption and anti-fraud policies are in place and enforced for all funding received from or through UNDP.

Risk Management

e) The requirements of the following documents, then in force at the time of signature of the Project Document, apply to each responsible party, subcontractor and sub-recipient: (a) UNDP Policy on Fraud and other Corrupt Practices and (b) UNDP Office of Audit and Investigations Investigation Guidelines. Each responsible party, subcontractor and sub-recipient agrees to the requirements of the above documents, which are an integral part of this Project Document and are available online at www.undp.org.

f) In the event that an investigation is required, UNDP will conduct investigations relating to any aspect of UNDP programmes and projects. Each responsible party, subcontractor and sub-recipient will provide its full cooperation, including making available personnel, relevant documentation, and granting access to its (and its consultants', subcontractors' and sub-recipients') premises, for such purposes at reasonable times and on reasonable conditions as may be required for the purpose of an investigation. Should there be a limitation in meeting this obligation, UNDP shall consult with it to find a solution.

g) Each responsible party, subcontractor and sub-recipient will promptly inform UNDP as the Implementing Partner in case of any incidence of inappropriate use of funds, or credible allegation of fraud or corruption with due confidentiality.

Where it becomes aware that a UNDP project or activity, in whole or in part, is the focus of investigation for alleged fraud/corruption, each responsible party, subcontractor and sub-recipient will inform the UNDP Resident Representative/Head of Office, who will promptly inform UNDP's Office of Audit and Investigations (OAI). It will provide regular updates to the head of UNDP in the country and OAI of the status of, and actions relating to, such investigation.

h) UNDP will be entitled to a refund from the responsible party, subcontractor or sub-recipient of any funds provided that have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of this Project Document. Such amount may be deducted by UNDP from any payment due to the responsible party, subcontractor or sub-recipient under this or any other agreement. Recovery of such amount by UNDP shall not diminish or curtail any responsible party's, subcontractor's or sub-recipient's obligations under this Project Document.

Where such funds have not been refunded to UNDP, the responsible party, subcontractor or sub-recipient agrees that donors to UNDP (including the Government) whose funding is the source, in whole or in part, of the funds for the activities under this Project Document, may seek recourse to such responsible party, subcontractor or sub-recipient for the recovery of any funds determined by UNDP to have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document.

The term "Project Document" as used in this clause shall be deemed to include any relevant subsidiary agreement further to the Project Document, including those with responsible parties, subcontractors and sub-recipients.

i) Each contract issued by the responsible party, subcontractor or sub-recipient in connection with this Project Document shall include a provision representing that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the proposal, have been given,

Multi Year Work Plan:

received, or promised in connection with the selection process or in contract execution, and that the recipient of funds from it shall cooperate with any and all investigations and post-payment audits.

j) Should UNDP refer to the relevant national authorities for appropriate legal action any alleged wrongdoing relating to the project or programme, the Government will ensure that the relevant national authorities shall actively investigate the same and take appropriate legal action against all individuals found to have participated in the wrongdoing, recover and return any recovered funds to UNDP.

k) Each responsible party, subcontractor and sub-recipient shall ensure that all of its obligations set forth under this section entitled "Risk Management" are passed on to its subcontractors and sub-recipients and that all the clauses under this section entitled "Risk Management Standard Clauses" are adequately reflected, mutatis mutandis, in all its sub-contracts or sub-agreements entered into further to this Project Document.

14 MULTI YEAR WORK PLAN:

Table 4: Component 1: Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius.

Tasks/Output	Responsible Authorities	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Outcome 1.1: Improved livelihood for a sustainable partnership and community-based approach to reef restoration							
Output 1.1.1 Coastal communities benefit from improved livelihoods through employment establishing and maintaining coral nurseries and transplantation sites.	MBEMRFS UNDP	■	■	■	■	■	■
Output 1.1.2 Coastal communities benefit from improved livelihoods through increased revenue from tourism (glass bottom boat tours, snorkeling and diving trips).	MBEMRFS and NGOs	■	■	■	■	■	■
Outcome 1.2: Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals.							
Output 1.2.1 Donor coral colonies of appropriate species (resilience, maintaining genetic diversity) available at sufficient scale (quantity, time, interval etc.) for propagation in nurseries.	MBEMRFS	■	■	■	■	■	■
Output 1.2.2 Reports on coral reef status, water quality, and other key environmental and social parameters for potential nursery sites.	MBEMRFS MDR, RRA	■	■	■	■	■	■

Multi Year Work Plan:

Tasks/Output	Responsible Authorities	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Output 3.2.2 Reef Restoration tool kit and manual for use in the WIO published and disseminated.	MBEMRFS MDR, RRA, MEECC, Nsey, SNPA, MCSS						
Outcome 3.3 Regional capacity developed for sustainable and climate resilient coral restoration.							
Output 3.3.1 Regional training programme on reef restoration in place, possibly with an associated Certificate of Competence.	MBEMRFS MDR, RRA, MEECC, Nsey, SNPA, MCSS						
Output 3.3.2 Regional training workshops undertaken on monitoring, DNA-based approach for the identification of resilient corals, and other topics as appropriate.	MBEMRFS MDR, RRA, MEECC, Nsey, SNPA, MCSS						
Output 3.3.3. Sustainable long-term monitoring programme developed and underway for restored reefs, based on international/regional protocols and best practice.	MBEMRFS MDR, RRA, MEECC, Nsey, SNPA, MCSS						
Outcome 3.4 Monitoring and Evaluation	UNDP, MBEMRFS MDR, RRA, MEECC, Nsey, SNPA, MCSS						
Project Management	UNDP						

Multi Year Work Plan:

Annex A. MONITORING PLAN

The Project Manager will collect results data according to the following monitoring plan.

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
Project Objective 1: To improve food security and livelihoods and mitigate disaster risk through active restoration of coral reefs degraded by coral bleaching as a result of climate change in Mauritius and Seychelles, at a larger scale than ever tested in the past	Indicator 1.	Area of targeted degraded sites restored to scale using farmed corals, with good survivorship and growth rates of the colonies	Mapping/Biological Survey	1 st year 4 th year and 6 th year	MOI SNPA MCSS NSeY	Survey, evaluation report, Annual Progress Report	No major events (climate, tsunami) occur during the project period, allowing the timely transplantation of nursery grown coral colonies.
	Indicator 2.	Number of stakeholders with improved livelihoods due to new and sustained employment & business opportunities related to coral restoration activities and/or due to the improved coastal and marine ecosystems supported by the restored corals	Survey	Annually	Activity Partners	Livelihood Survey Operations report	Coastal communities and stakeholders have successfully completed the training provided and are interested in undertaking new business approach for coral-based business. Still room left for growth for economic activities (e.g. tourism) without compromising the health of the coastal and marine ecosystems supported by the restored corals.
	Indicator 3.	Number of people trained and involved in the establishment, maintenance and monitoring of successful ocean nurseries for corals	Survey Workshop / training attendance Data disaggregated by community groups. Household status, gender and age groups	Annually	Activity Partners	Monitoring and evaluation reports for land-based and ocean-based nurseries; staff contracts; volunteer contracts	Low turnover for community members and staff involved until the end of the project Scientific diver volunteers change every 3 months Community member, staff and volunteers learn to work together through the project lifetime Sufficient number of qualified local population interested in the training and engagement in coral restoration work.
Project Objective 2: To generate knowledge about effective restoration	Indicator 1.	Number research papers on coral reef restoration submitted for presentation at	Progress Reports	At least twice during the duration	PMU	Report published in peer-reviewed	Studies, Reports and Research papers on coral reef restoration initiatives in

⁴⁷ Risks must be outlined in the Feasibility section of this project document.

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
techniques for dissemination to other SIDS and countries within the wider region.		various scientific forums in the WIO and globally, with female scientists' participation in publication efforts actively supported.		of the project.		journals & Project Progress Report	the region and globally available and accessible. Capacity of key stakeholders on coral reef restoration techniques and coral genetics analysis including clade analysis built. Sufficient number of qualified female scientists interested in the coral restoration science field.
	Indicator 2.	Number of "lessons learned" generated and disseminated through various communication channels and knowledge exchange fora on the practical topics relevant to the coral restoration efforts at scale, including 1) coral restoration financing, 2) climate change resilience of the applied techniques, 3) upscaling efforts, 4) financial and technical sustainability, 5) stakeholder and private sector engagement and buy-ins, 6) women and youth empowerment;	Website Progress reports Operations Report	Quarterly	PMU MOI AFRC Activity Partners	"Lessons learned" communication materials (in any appropriate format)	
Component⁴⁸ 1 Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius.	Indicator 1.	Number of community members (as identified in Community Action Plan and any other complementary analysis) trained in establishing and maintaining proposed coral nurseries (Data disaggregated by community groups, gender and age group), with a particular attention given to increasing female and youth participants/trainees	Training/workshop attendance	Quarterly and Annually	Activity Partners	Training Reports Consultant reports Responsible Parties annual report	Community members have successfully completed the training provided

⁴⁸Outcomes are short to medium term results that the project makes a contribution towards, and that are designed to help achieve the longer term objective. Achievement of outcomes will be influenced both by project outputs and additional factors that may be outside the direct control of the project.

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
	Indicator 2.	Number of coral restoration economic and financial strategies developed for sustainable financing mechanism	Progress Report	Quarterly and Annually	PMU Activity Partners	coral restoration economic and financial strategy document	Mauritius economy remains stable, tourism remains at same level or higher, so that the business plan is implemented as written.
	Indicator 3.	Number of partnership agreement signed for job opportunities	Progress Report	Annually	PMU Activity Partners	Signed Agreement document	Mauritius economy remains stable, tourism remains at same level or higher, so that the business plan is implemented as written.
	Indicator 4.	Number of people benefiting from improved income as result of the project, with particular attention given to increasing beneficiaries from female-headed households.	Surveys	Annually	Activity Partners	Livelihood surveys, annual reports from NGOs	Coastal communities have successfully completed the training provided and are participating fully throughout the duration of the project
	Indicator 5.	Number of coral species for propagation based on resilience and genetic diversity identified.	Clade Analysis Report	Once, by end of year 1	MOI/AFRC	Technical Assessment Report on coral species identified, Minutes of Steering Committees	Preliminary findings on list of coral species that are suitable for culture in Mauritius readily available. Personnel of the MOI has been effectively trained for clade analysis and genetic connectivity.
	Indicator 6.	Number of donor sites with locally threatened species (Mauritius & Rodrigues) identified	Survey	Once, by end of year 1	MOI/AFRC	Survey Reports	Preliminary findings on list of locally threatened coral species readily available. Favourable weather conditions allow the timely completion of surveys
	Indicator 7.	percentage of high-thermal tolerance corals collected from donor sites for propagation in nurseries.	Survey	Quarterly	MOI/AFRC	Technical assessment report, Report on genetic analysis, survey report of donor site	Favourable weather conditions, including no extreme El Niño events causing bleaching of aqua-cultured resilient coral species
	Indicator 8.	Number of survey for identification of nursery sites (Mauritius and Rodrigues)	Survey	Annually	MOI/ARFC	Survey reports	List of Nursery site locations based in MPAs/Marine Parks available, Favourable weather conditions allow the timely completion of surveys

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
	Indicator 9.	Number of Environmental and Social Monitoring surveys carried out	ESM Reports	Quarterly/Annually	Activity Partners /PMU	Environment and Social Monitoring Reports	implementation of the project does not lead to social issues.
	Indicator 10.	Number of Land based nursery established and operational	- Operational reports of nurseries - Progress Report	Annually	MBEMRFS/ Activity Partners	Monitoring and evaluation report for nursery site, Physical verification (site visits), Operational reports, List of assets	Timely delivery and availability of necessary equipment for set up of nurseries
	Indicator 11.	Number of infrastructures for nursery seeding from sexual reproduction (Mauritius) established	- Progress Reports	Annually	Activity Partners / MBEMRFS	Monitoring and evaluation report for nursery site, Physical verification (site visits), Operational reports, List of assets	Favourable weather conditions allow the timely collection of spawns/larvae from the wild during spawning seasons
	Indicator 12.	Number of ocean-based nurseries established and operational in Mauritius	- Progress Reports	Annually	Activity Partners / MBEMRFS	Monitoring and evaluation report for nursery site, Physical verification (site visits), Operational reports, List of assets	Timely delivery and availability of necessary equipment
	Indicator 13.	Number of community members involved in the maintenance and monitoring of new ocean-based nurseries in Mauritius	- Operation Report of Nurseries	Quarterly/Annually	Activity Partners / MBEMRFS	Monitoring and evaluation report for nursery site	Community members involved till the end of the project - low turnover
	Indicator 14.	Number of ocean-based nurseries established and operational in Rodrigues	- Progress Reports	Annually	Activity Partners / MBEMRFS	Monitoring and evaluation report for nursery site, Physical	Timely delivery and availability of necessary equipment

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
						verification (site visits), Operational reports, List of assets	
	Indicator 15.	Number of community members involved in the maintenance and monitoring of ocean-based nurseries in Rodrigues	- Operation Report of Nurseries	Quarterly/Annually	Activity Partners / MBEMRFS	Trained work force in field of coral farm management Monitoring and evaluation report (from monitoring)	Community members involved till the end of the project
	Indicator 16.	Number of coral fragments under culture in land-based nursery (Mauritius)	- Technical and monitoring reports	Quarterly	Activity Partners / MBEMRFS	Monitoring and evaluation report for nursery site	The actual survival rate of coral fragments is as per estimated survival rates based on past studies and research undertaken by MOI (75%)
	Indicator 17.	Percentage of coral polyps successfully settled in situ	- Technical and monitoring reports	Bi-annually	AFRC	Technical and monitoring reports	Surveys of dates of spawning have been identified correctly and that all conditions are favourable for settling of coral polyps.
	Indicator 18.	Number of coral fragments under culture in new ocean-based nurseries in Mauritius	- Technical and monitoring reports	Quarterly	Activity Partners / MBEMRFS	Monitoring and evaluation report for nursery site	The actual survival rate of coral fragments is as per estimated survival rates based on past studies and research undertaken by MOI (75%)
	Indicator 19.	Number of coral fragments under culture in ocean-based nurseries in Rodrigues	- Technical and monitoring reports	Quarterly	Activity Partners / MBEMRFS	Monitoring and evaluation report	Timely delivery and availability of necessary equipment Favourable weather conditions allow the timely completion of surveys
	Indicator 20.	Areas of site successfully restored using farmed corals of resilient species in Mauritius and Rodrigues	- Mapping	Annual	MOI/AFRC	- Monitoring reports and GIS Mapping - Site visits - PPR	Favourable weather conditions allow the timely completion of surveys, transplantation of corals, maintenance and monitoring of restored sites
	Indicator 21.	percentage of live coral cover and quality of restoration sites (including, restored coral health status, coral recruitment, fish biomass, fish	- Biological Survey	1 st year 4 th year and 6 th year	Activity Partners / MBEMRFS	Monitoring report to assess the temporal progress of the project.	Favourable weather conditions (incl. no El Nino events experience). There is high survival rate of transplanted corals.

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
		diversity and fish catch amongst others)					
Component 2 Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Seychelles	Indicator 1.	Number of people trained in establishment and maintenance of coral nurseries (Data disaggregated by community groups, gender and age group), with a particular attention given to increasing female and youth participants/trainees	Training/workshop attendance	Quarterly and Annually	Activity Partners	Surveys, Training certificates, annual reports from NGOs	Participants are willing to be trained in coral reef restoration and have successfully completed the training provided
	Indicator 2.	Number of business plan and sustainable financing mechanisms for the maintenance and monitoring of coral restoration activities with recommendations	Progress Report APR	Quarterly and Annually	Activity Partners	Statistics from Government of Seychelles Signed MOUs Business plan document Products marketed & sold	Seychelles economy remains stable, tourism remains at same level or higher, so the business plan is implemented as written
	Indicator 3.	Number of stakeholders with improved livelihoods due to new employment & business opportunities, with particular attention given to increasing beneficiaries from female-headed households.	Progress Reports	Annually	Activity Partners	Surveys, annual reports from NGOs	Participants are willing to be trained in coral reef restoration and have successfully completed the training provided Sufficient entrepreneurs motivated to develop associated business opportunities
	Indicator 4.	Number of coral species for propagation based on resilience and genetic diversity identified	Clade Analysis study	Once, by end of year 1	Activity Partners and MOI/AFRC	Technical Report on coral species identified, Minutes of Steering Committee	New coral species selected will perform equally or better than coral species of the Reef Rescuers project
	Indicator 5.	Number of donor sites with resilient and resistant coral species identified	Survey	Annually	Activity Partners	Donor site survey reports	List of local thermal tolerant coral species available Favourable weather conditions allow the timely completion of surveys
	Indicator 6.	percentage of climate resilient coral collected from donor sites for propagation in nurseries	Survey	Quarterly	Activity Partners	Technical assessment report, report on	Favourable weather conditions, including no extreme El Nino events

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
						genetic analysis, survey report of donor site	causing bleaching of aqua-cultured resilient coral species.
	Indicator 7.	Surveys for identification of nursery sites including parameters suitable for maximized coral growth	Survey	Annually	Activity Partners	Reports on nursery sites	Species selection is science-based and performs as in previous projects. Adequate environmental conditions remain for ideal coral growth in nurseries
	Indicator 8.	Number of Environmental and Social Risk Assessment Reports	ESM Reports	Annually	Activity Partners /PMU	Annual Environment and Social Risk Assessment Reports	Implementation of the project does not lead to environmental and social issues
	Indicator 9.	Number of land-based nursery established and operational	- Operational reports of nurseries - Progress Report	Annually	N Sey	Monitoring and evaluation report for land-based nursery	Land based nursery will work for production of coral sexual recruits; availability of necessary workers, equipment and materials to build land-based nursery
	Indicator 10.	Number of ocean-based nurseries established and operational	- Progress Reports	Annually	Activity Partners	Monitoring and evaluation report for ocean nursery sites, physical verification (site visits), operational reports, list of assets	Timely delivery and availability of necessary equipment and materials to build ocean nurseries
	Indicator 11.	Number of people involved in the maintenance and monitoring of new land and ocean-based nurseries	- Operation Report of Nurseries	Quarterly/Annually	Activity Partners	Monitoring and evaluation reports for land-based and ocean-based nurseries; staff contracts; volunteer contracts	Low turnover for community members and staff involved until the end of the project Scientific diver volunteers change every 3 months Community member, staff and volunteers learn to work together through the project lifetime
	Indicator 12.	Number of coral fragments under culture in land-based nursery	- Technical and monitoring reports	Quarterly	Activity Partners	Monitoring and evaluation	The survival rate of coral fragments in the land nursery is similar or better than the survival rate in past ocean

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
			- Progress reports			reports for land nursery site	nurseries (75 %) implemented by Nature Seychelles
	Indicator 13.	Number of coral fragments under culture in new ocean nurseries	- Technical and monitoring reports - Progress reports	Quarterly	Activity Partners	Monitoring and evaluation reports for ocean nursery site	The survival rate of coral fragments in ocean nurseries is similar (75%) or better than in previous Reef Rescuers project; No major mass bleaching events, or crown-of-thorns & Drupella snail invasions during project period
	Indicator 14.	Area of site successfully restored with nursery grown corals	- Mapping	Annual	Activity Partners	Monitoring reports, GIS Mapping	Favourable weather conditions allow the timely completion of surveys, transplantation of corals, maintenance and monitoring of restored sites The survival rate of transplanted corals is similar or better than in previous Reef Rescuers project; No major mass bleaching events, or crown-of-thorns & Drupella snail invasions during project period
	Indicator 15.	Number of people involved in cementing corals to the degraded reefs and monitoring restoration effects	- Operation Report of Nurseries	Quarterly/Annually	Activity Partners	Monitoring reports for restored reefs; staff contracts; volunteer contracts	The survival rate of transplanted corals is similar or better than in previous Reef Rescuers project; No major mass bleaching events, or crown-of-thorns & Drupella snail invasions during project period
	Indicator 16.	percentage of live coral cover and quality of restoration sites (including, restored coral health status, coral recruitment, fish biomass, fish diversity and fish catch amongst others)	- Monitoring reports	Annually	Activity Partners	3 reports (coral reef ecosystem including, restored coral health status, coral recruitment, fish biomass, fish diversity and fish catch amongst others) to assess the temporal progress of the	Favourable weather conditions allow the timely completion of surveys, transplantation of corals, maintenance and monitoring of restored sites

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
						project - beginning, midterm and end of project	
Component 3 Knowledge management and sharing, training and sensitization to build regional capacity for sustainable reef restoration	Indicator 1.	Comprehensive review of coral reef restoration in the region and globally undertaken	Project Progress Report	Mid and end of project	PMU/MBE MRFS/MEEC C	Report on comprehensive review of coral reef restoration & Project Progress Report	Studies, Reports and Research papers on coral reef restoration initiatives in the region and globally available and accessible
	Indicator 2.	Methodologies for coral restoration in Mauritius and Seychelles developed, based on best available science and practices	Progress Report	Annually	PMU/MBE MRFS/MEEC C	Methodologies developed and adopted for coral reef restoration activities. Project Progress Report Guideline document & survey Report (currents/wave pattern, GIS/habitat mapping, physico-chemical surveys of sites, inventory of coral species, genetic identification of resilient species, water quality amongst others)	Studies and Research papers on coral reef restoration methodology accessible Reports on past and current coral reef restoration projects locally and in the region readily available
	Indicator 3.	Research and surveys on key information for reef restoration undertaken	Progress reports	Annually	PMU/MOE MRGS/MEE CC	Report on research and analysis Published papers.	Capacity of key stakeholders on coral reef restoration techniques and coral genetics analysis including clade analysis built
	Indicator 4.	Knowledge sharing platform on reef restoration for sharing lessons learned developed	Progress reports	Quarterly & annually	PMU	Project Progress report	Knowledge sharing platform developed and operational

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions ⁴⁷
	Indicator 5.	Reef Restoration Manual developed	Progress Report	Quarterly & annually	PMU	Coral Reef Manual and website where it is made accessible	Active participation and collaboration of the key stakeholders of coral reef restoration for the timely drafting of the manual
	Indicator 6.	Number of members from Mauritius and Seychelles trained in coral reef restoration methods, with particular attention given to increasing female participants/beneficiaries from the capacity building activities	Progress report	Annually (APR)	PMU	Project Progress report + Training report	Members have successfully completed the training provided
	Indicator 7.	Number of members from Mauritius and Seychelles trained in advanced coral genetics including clade analysis, with particular attention given to increasing female participants/beneficiaries from the capacity building activities	Progress Report	Annually (APR)	PMU	Training report + Lab-book records	Recruitment of a consultant or sponsored training to an international genetic facility (with advanced knowledge in coral genetics) Timely delivery and availability of additional lab equipment
	Indicator 8.	Regional Coral Restoration Plan including national component and long-term monitoring programme	Progress Report	Mid-term and terminal	PMU	Regional Coral Reef Restoration Plan Project Progress Report	Literature on coral reef restoration selection criteria accessible Reports on past and current coral reef restoration projects locally readily available
	Indicator 9.	Participation in regional and international forums	Progress Report	Mid-term and terminal	PMU	Feedback report minutes of Regional/international forum	Commitment of stakeholders to produce research papers documenting the findings of the coral restoration initiative
	Indicator 10.	Regional Studies on wave patten, beach erosion and mapping	Progress report	Quarterly	PMU	Survey reports research paper	There is full cooperation between Mauritius and Seychelles. Commitment of stakeholders to produce research papers documenting the findings
Mid-term and Terminal Review (if FSP project only)	N/A	N/A	To be outlined in MTR inception report	Submitted to AF same year as 4 th and 6 th ARPs	<i>Independent evaluator</i>	Completed MTR and TR	There is full cooperation between Mauritius and Seychelles

Multi Year Work Plan:

Project Delivery	Indicators	Description	Data source /Collection Methods	Frequency	Responsible for data collection	Means of Verification	Assumptions⁴⁷
Environmental and Social risks and management plans, as relevant.	N/A	N/A	ESMP	Annually	PMU UNDP CO	ESMP report	There is full cooperation between Mauritius and Seychelles

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Annex B. EVALUATION PLAN:

Evaluation Title	Planned start date Month/year	Planned end date Month/year	Included in the Country Office Evaluation Plan	Budget for consultants⁴⁹	Other budget (i.e. travel, site visits etc...)	Budget for translation
Mid Term Evaluation	Between 3 rd and 4 th APR	To be submitted to AF with the 4 th APR	Yes	USD 45,000	Included in the budget for consultants	N/A
Terminal Evaluation	3 months before operation closure	To be submitted to AF within three months of operational closure	Yes	USD 45,000	Included in the budget for consultants	N/A
Audition	Last month of first year	Last month of 6 th year	Yes	USD 30,000	N/A	N/A
Total evaluation budget				USD 120,000		

⁴⁹ The budget will vary depending on the number of consultants required (for full size projects should be two consultants); the number of project sites to be visited; and other travel related costs. Average # total working days per consultant not including travel is between 22-25 working days.

Multi Year Work Plan:

Annex C. TERMS OF REFERENCE FOR PROJECT STAFF /CONSULTANTS

Key Terms of Reference

Included herein:

- Regional Project Manager (RPM)
- Project Assistant (PA)
- Financial Assistant (FA)
- Chief Technical Advisor (CTA)
- Project Gender Officers
- Project Steering Committee (PSC)
- Project National Coordination Committee (PNCC)
- Regional Scientific Advisory Committee (RSAC)

1. Regional Project Manager (RPM)

Background

The Regional Project Manager (RPM) will be locally recruited based on an open competitive process. He/she will be responsible for the overall day-to-day management of the project, including the mobilization of all project inputs, supervision over project staff, consultants and sub-contractors. The RPM will report to the UNDP-CO, in close consultation with the host institution for all the project's substantive and administrative issues. From the strategic point of view of the project, the RPM will report on a periodic basis to the Project Steering Committees (PSC) at the regional level and to the Project National Coordinating Committees (PNCC) at the national level. Generally, the RPM will be responsible for meeting government obligations of the two countries under the project, under the Direct Implementing (DIM) Modality. He/she will perform a liaison role with the Government, UNDP and other UN Agencies, NGOs and project partners, and maintain close collaboration with any donor agencies providing co-financing.

Duties and Responsibilities

- Supervise and coordinate the production of project outputs, as per the project document;
- Mobilize all project inputs in accordance with UNDP procedures for nationally executed projects;
- Supervise and coordinate the work of all project staff, consultants and sub-contractors;
- Coordinate the recruitment and selection of project personnel;
- Prepare and revise project work and financial plans, as required by UNDP;
- Liaise with UNDP, relevant government agencies, and all project partners, including donor organizations and NGOs for effective coordination of all project activities; Facilitate administrative backstopping to subcontractors and training activities supported by the Project;
- Oversee and ensure timely submission of the Inception Report, Annual Progress Report (APR), Technical reports, quarterly financial reports, and other reports as may be required by UNDP, AF and other oversight agencies;
- Disseminate project reports and respond to queries from concerned stakeholders;
- Will act as Secretariat to the PSC and PNCCs.
- Report progress of project to the PSC, and ensure the fulfilment of its directives;
- Oversee the exchange and sharing of experiences and lessons learned with relevant community based integrated conservation and development projects nationally and internationally;
- Ensures the timely and effective implementation of all components of the project;

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- Carry out regular Environmental and Social Impact monitoring, as required
- Handle any grievances received and respond accordingly as per the Stakeholder Response Mechanism of UNDP.
- Assist community groups, municipalities, NGOs, staff, students and others with development of essential skills through training workshops and on the job training thereby upgrading their institutional capabilities;
- Coordinate and assists scientific institutions with the initiation and implementation of all field studies and monitoring components of the project; and
- Perform any other duty relevant to the assignment.

Competencies

Corporate Competencies:

- Demonstrates integrity by modelling the UN's values and ethical standards;
- Promotes the vision, mission, and strategic goals of UNDP;
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability; and
- Treats all people fairly without favouritism.

Functional Competencies:

Knowledge Management and Learning:

- Promotes a knowledge sharing and learning culture in the office;
- In-depth knowledge on sustainable development issues and the mainstreaming of biodiversity conservation;
- Ability to advocate and provide policy advice; and
- Actively works towards continuing personal learning and development in one or more Practice Areas, acts on learning plan and applies newly acquired skills.

Development and Operational Effectiveness:

- Ability to lead strategic planning, results-based management and reporting;
- Ability to lead formulation, implementation, monitoring and evaluation of sustainable development programmes and projects, and mobilize resources;
- Good knowledge of the Results Management Guide and Toolkit;
- Strong IT skills; and
- Ability to lead implementation of new systems and processes and affect staff behavioural/attitudinal change.

Management and Leadership:

- Focuses on impact and results for the client and responds positively to feedback;
- Leads teams proactively and effectively and shows conflict resolution skills;
- Consistently approaches work with energy and a positive, constructive attitude;
- Demonstrates strong oral and written communication skills;
- Builds strong relationships with clients and external actors;
- Remains calm, in control and good humoured even under pressure; and
- Demonstrates openness to change and ability to manage complex situations.

Required Skills and Experience

Education:

Multi Year Work Plan:

- A Master's degree in Environmental, Natural Sciences or Natural Resources Management;
- Master's degree in management/project management is also highly desirable and can be accepted in place of a degree in Environment if completed by adequate experience.

Experience:

- At least 5 years of experience in natural resource planning and management;
- At least 5 years of project/programme management experience and at least 3 years of experience in international/regional project management
- Working experience with the project national stakeholder institutions and agencies is desired;
- Ability to effectively coordinate a large, multi-stakeholder project;
- Ability to administer budgets and prepare work plans;
- Ability to mobilize, train and work effectively with counterpart staff at all levels and with all groups involved in the project;
- Working experience with donor funded projects (UNDP, UNDEP, GEF, AF, EU, WHO, FAO, etc) will be an advantage.
- Strong drafting, presentation and reporting skills;
- Good IT skills (word processing, presentation, spread sheets, internet, email); and
- Excellent oral and written communication skills.

Language:

- Fluency in English and French (written & spoken).

Nationality:

- international.

2. Project/Finance Assistant

Background

The Project/Finance Assistant will be locally recruited based on an open competitive process. He/she will be responsible for the overall administration of the project. The Project/Finance Assistant will report to Regional Project Manager. He/she will be based in Mauritius. Generally, the Project/Finance Assistant will be responsible for supporting the Regional Project Manager in meeting the two governments obligations under the project, under the Direct Implementation (DIM) Modality.

Duties and Responsibilities

- Collect, register and maintain all information on project activities;
- Contribute to the preparation and implementation of progress reports;
- Monitor project activities, budgets and financial expenditures;
- Advise all project counterparts on applicable administrative procedures and ensures their proper implementation;
- Maintain project correspondence and communication;
- Support the preparations of project work-plans and operational and financial planning processes;
- Assist in procurement and recruitment processes;

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- Assist in the preparation of payments requests for operational expenses, salaries, insurance, etc. against project budgets and work plans;
- Follow-up on timely disbursements by UNDP CO;
- Receive, screen and distribute correspondence and attach necessary background information;
- Prepare routine correspondence and memoranda for Project Manager's signature;
- Assist in the Environmental and Social Impact monitoring, to be carried out on regular basis.
- Assist in logistical organization of meetings, training and workshops;
- Assist in the handling of any grievances received and respond accordingly as per the Stakeholder Response Mechanism of UNDP.
- Prepare agendas and arrange field visits, appointments and meetings both internal and external related to the project activities and write minutes from the meetings;
- Maintain project filing system;
- Maintain records over project equipment inventory; and
- Perform any other duty relevant to the assignment.

Competencies

Corporate Competencies:

- Demonstrates commitment to UNDP's mission, vision and values;
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability;
- Highest standards of integrity, discretion and loyalty.

Functional Competencies:

Knowledge Management and Learning:

- Shares knowledge and experience;
- Actively works towards continuing personal learning, acts on learning plan and applies newly acquired skills;
- Excellent written and oral communication skills.

Development and Operational Effectiveness:

- Ability to perform a variety of standard tasks related to Results Management, including screening and collecting of projects documentation, projects data entering, preparation of revisions, filing, provision of information;
- Ability to provide input to business processes re-engineering, implementation of new system, including new IT based systems.

Leadership and Self-Management:

- Focuses on result for the client and responds positively to feedback;
- Consistently approaches work with energy and a positive, constructive attitude;
- Remains calm, in control and good humoured even under pressure.

Required Skills and Experience

Education:

- Minimum Bachelor's Degree in; Management, Engineering, Economics, Finance, Biology and or Environmental Sciences, Public Administration.

Experience:

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- At least 3 years in project management, administrative and/or financial management, environmental management experience;
- Demonstrable ability to administer project budgets, and track financial expenditure;
- Demonstrable ability to maintain effective communications with different stakeholders, and arrange stakeholder meetings and/or workshops;
- Excellent computer skills, in particular mastery of all applications of the MS Office package.
- Experience in ATLAS or other enterprise software will be an advantage.

Language:

- Fluency in English and French (written & spoken).

Nationality:

- Mauritian only

3. Chief Technical Advisor

Background

The Chief Technical Advisor (CTA) will be responsible for providing overall technical backstopping to the Project. He/she will render technical support to Project Management Unit (PMU) and other government counterparts. The CTA will support the provision of the required technical inputs, reviewing and preparing Terms of References and reviewing the outputs of consultants and other sub-contractors. The CTA will also provide the principal technical input on Coral Reef Restoration. He/she will report directly to the National Project Directors of each Country and the UNDP.

Duties and Responsibilities

- Provide technical support to the PMU and other government counterparts in the areas of project management and planning, management of site activities, monitoring, and impact assessment;
- Provide the necessary technical input on Coral Reef Restoration;
- Support the PMU in preparing Terms of Reference for consultants and sub-contractors, and assist in the selection and recruitment process;
- Support the PMU in coordinating the work of all consultants and sub-contractors, ensuring the timely delivery of expected outputs, and ensuring an effective synergy among the various sub-contracted activities;
- Support the PMU in the preparation of the Annual Progress Report (APR), inception report, technical reports, quarterly financial reports for submission to UNDP, the AF, other donors and Government Departments, as required;
- Support PMU in mobilizing staff and consultants in the conduct of a mid-term project evaluation, and in undertaking revisions in the implementation program and strategy based on evaluation results;
- Assist the PMU in liaison work with project partners, donor organizations, NGOs and other groups to ensure effective coordination of project activities;
- Oversee the handling of any complaints received.
- Oversee the Environmental and Social Impact monitoring.
- Support the PMU in documenting lessons from project implementation and make recommendations to the Project Steering Committee for more effective implementation and coordination of project activities; and
- Perform other tasks as may be requested by the PMU and UNDP.

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Qualifications

- University education (MS or PhD), with specific expertise in the area of Coral Reef Restoration, with a good understanding of conservation, sustainable use and management of marine and coastal biodiversity;
- At least 15 years of professional experience in conservation, sustainable use and management of marine and coastal biodiversity;
- Demonstrable experience in implementing equivalent AF or other multilateral donor-funded projects;
- Be an effective negotiator with excellent oral and presentation skills;
- A good working knowledge of international best practice in conservation, sustainable use and management of biodiversity is desirable;
- Excellent writing skills; and
- Fluency in English is required. A working knowledge of French is desirable.

4. Project Gender Officer

Under the overall supervision and guidance of the Regional Project Manager, the Gender Officer will have the responsibility for the implementation of the Gender Action Plan. The Gender Officers will work closely with the Responsible Parties and Project Management Unit on related aspects of project implementation, reporting, monitoring, evaluation and communication. Specific responsibilities will include:

Duties and Responsibilities

- Monitor progress in implementation of the project Gender Action Plan ensuring that targets are fully met and the reporting requirements are fulfilled;
- Oversee/develop/coordinate implementation of all gender-related work;
- Review the Gender Action Plan annually, and update and revise corresponding management plans as necessary;
- Assist the PMU in the monitoring of Environmental and Social Risk and reporting.
- Work with the M&E Consultants to ensure reporting, monitoring and valuation fully address the gender issues of the project;

Qualifications

- Master's degree in gender studies, gender and development, environment, sustainable development or closely related area.
- Demonstrated understanding of issues related to gender and sustainable development; at least 5 years of practical working experience in gender mainstreaming, women's empowerment and sustainable development in relevant Country/Region/Area of Work;
- Proven experience in gender issues in Country/Region/Area of Work
- Previous experience with UN projects will be a definite asset;
- Demonstrated understanding of the links between sustainable development, social and gender issues;
- Experience in gender responsive capacity building;
- Experience with project development and results-based management methodologies is highly desired/required;
- Excellent analytical, writing, advocacy, presentation, and communications skills.
- Excellent language skills in English (writing, speaking and reading) and in local languages.

5. Project Steering Committee (PSC)

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The PSC will serve to guide the overall implementation of the project. The PSC will serve as the primary decision-making body to which the PMU and the Project National Coordinating Committee (PNCC) will report.

Specifically, the PSC will ensure that project goals and appropriate AF procedures for reporting are met. It will ensure complementarities across the two project countries, ensure knowledge sharing and avoid duplication of efforts that could lead to wasteful expenditures.

Membership of the Project Steering Committee:

- The members of the PSC will be composed of representatives of the Project National Coordinating Committees (at least 6 from each country including Responsible Parties and Activity Partners), UNDP, and the PMT
- The Chair and Co-Chair of the PSC will be elected at each Committees among the senior officials of the project Countries. They should be a representative of each country.
- Representatives of the Regional Scientific Advisory Committee may be invited as observers/advisors, as necessary to any meeting of the Committee.

Secretariat

The PMU will act as Secretariat for the PSC.

Meetings of the Committee:

The PSC will physically meet at least once a year, alternating the venue between the two countries. The PSC can be called, as needs arise, using modern telecommunication means.

Role and function:

- a) Oversee and provide overall direction to the project and to give guidance to the Project Management Unit and National Teams.
- b) Review, discuss and approve the annual work plan, procurement plans and budget for the project;
- c) Develop and approve terms of reference for the Project National Coordinating Committees and oversee their functioning to ensure inter-ministry involvement and the active involvement of all stakeholders;
- d) Review periodic monitoring and evaluation reports and advise the PMUs accordingly.
- e) Review Annual Progress Report.
- f) Monitor the implementation of the project, ensuring that any strategic changes are undertaken in a timely manner so that the project achieves its goals.
- g) Take note of any grievances received and provide advice on remedial actions and lessons learned.
- h) Co-ordinate with the Project Management Unit to ensure the project stays on schedule and that project outputs are being completed on time and within budget;
- i) Co-ordinate the work of Regional Scientific Advisory Committee that may be established;
- j) Agree to these terms of reference in their first meeting and make any amendments as necessary.

Conduct of Committee Business

- The Project Steering Committee will aim to achieve consensus on decisions made. In the event this proves impossible, decisions may be made by simple majority vote amongst

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participating members. In the event of a tie, the Chairperson will have an additional casting vote.

- The PSC may from time to time review these terms of reference and its membership and make necessary adjustments and amendments

6. Project National Coordinating Committee (PNCC)

The Project National Coordinating Committee (PNCC) will be established in each country to guide the implementation of the project at National Level. The PNCC will provide recommendations and information to the PSC. Specifically, the PNCC will monitor project implementation at the national level, will act as immediate grievance resolution mechanism and serve as the forum for national stakeholder participation.

Members of the Project National Coordinating Committee:

- The members of the PNCC will be the national stakeholders, including, but not limited to: relevant government ministries, Responsible Party, Activity Partners, the National Team, members of the Regional Scientific Advisory Committee, NGOs, Private sector, Civil Societies, academia, and other relevant stakeholders.
- The highest official of the Enforcing Entity of each country will chair the PNCC.
- The PNCC may opt to invite additional experts (observers/advisors) as necessary to any meeting of the Committee.

Secretariat:

- The Project Management Unit will act as Secretariat for the PNCC

Meetings of the Committee:

- The PNCC will meet according to necessity, but not less than once in 4 months. The PNCC will otherwise maintain regular communication by e-mail and teleconference as appropriate and necessary.
- The PNCC may convene *Ad hoc* committees to advise the PNCC on specific matters.

Role and function:

The PNCC will operate by consensus to:

- Provide direction to the project and to give guidance to the PMU and National Team at National Level;
- Develop, review and approve work plans at National level for submission to the PSC;
- Monitor project execution at National level;
- Co-ordinate with the PMU to ensure the project stays on schedule and that project outputs are being completed on time and within budget;
- Review and approve the Environmental and Social Impact Assessment monitoring at national level.
- Act as immediate grievance resolution mechanism and respond accordingly.
- Agree to these terms of reference in their first meeting with any amendments as necessary.

Conduct of Committee Business

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- The Project National Coordinating Committee will aim to achieve consensus on decisions made. In the event this proves impossible, decisions may be made by simple majority vote amongst participating members. In the event of a tie, the Chairperson will have an additional casting vote.
- The PNCC may from time to time review these terms of reference and its membership and make necessary adjustments and amendments

7. Regional Scientific Advisory Committee (RSAC)

The RSAC will be established to advise the Project Steering Committee and to ensure that the activities undertaken through the project are appropriately coordinated and communicated at the regional level. The RSAC will be a virtual committee. However, the members will meet at least twice during the course of the project, as back to back meeting to PSC meeting.

Duties

- Provide technical advice to the PMU, National team, PNCC and PSC
- Review the documents/reports, especially regarding outputs of component 3.
- Validate the process and results of the research activities
- Ensure that the best scientific knowledge and best technical standards are respected.
- Assist in identification of keynote/plenary speakers and scientists for contributions to the conference.
- Assist in establishment of review and selection process of abstracts for oral, poster presentations or workshops for the conference.
- Assist in review of documents produced for the conferences, eg. background documents, white papers programmes etc.
- Validate the quality of the reports prepared.
- Review toolkit to be produced at the end of the project.

Composition

The RSAC will be composed of:

- Relevant Scientifics from each country, including recognized international and regional coral reef restoration experts namely from, Australia, Madagascar, Maldives, South Africa, Sri Lanka and Thailand.
- CTA
- Accademia from each country
- The members of the RSAC will be approved by the PSC.

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Annex D. SIGNED SOCIAL AND ENVIRONMENTAL SCREENING PROCEDURE (SESP)

See enclosed document

Annex E. ENVIRONMENTAL AND SOCIAL RISK MANAGEMENT PLAN.

See enclosed document

Annex F. UNDP QUALITY ASSURANCE

See enclosed document

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Annex G. UNDP Risk LOG

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
1.	Loss of government support may result in lack of prioritization of proposed project activities.	07 August 2017	Political	It may become more difficult to get the full engagement of higher level Government staff and politicians, if coral restoration activities appear to constrain development, or has an apparent high cost that is not understood to bring benefits. P =1 I = 4	Regular stakeholder consultation and involvement will be undertaken to ensure that government maintains its commitment and considers the proposed project as a support to its costal protection and coral restoration programmes.	MBEMRFS MEECC			No change
2.	Disagreement amongst stakeholders with regards to demonstration of site selection in Mauritius and Seychelles.	07 August 2017	Operational	Discussion about the demonstration site among the stakeholders may become a distraction from the coral restoration and may cause delay in the implementation. P =1 I = 4	<ul style="list-style-type: none"> Intervention sites have been selected at the preparation stage. There will be a participatory approach to the proposed project, particularly with regard to intervention site selection. The Selected sites need to be reconfirmed at the LPAC50 stage. 	Project Manager			No change

⁵⁰ Local Project Appraisal Committee

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#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
3.	Capacity constraints of local institutions may limit the ability to undertake the research and interventions in Seychelles	07 August 2017	Institutional	It may be difficult to obtain full engagement of local institution if they feel they do not have the capacity to undertake in research in the domain of coral restoration. P=1 I=2	Collaboration and exchange between local institutions and Regional research institutes will be initiated and capacity building will be provided by Mauritius to the Seychellois counterparts.	Project Manager			No change
4.	Lack of commitment/buy-in from local communities may result in failure of intervention sites	07 August 2017	Operational	It may be more difficult to obtain the full engagement of the community if they do not find the change in livelihood beneficial in the long-term. P=3 I=3	Community stakeholders were consulted though a bottom-up approach integrating the community into the proposed project's implementation phases will be followed.	Project Manager			No change
5.	Disagreement among stakeholders with regard to roles in the proposed project.	07 August 2017	Institutional	Discussion on the roles and responsibilities about the areas of operation of each stakeholder may become a distraction from the implementation of the coral restoration activities P=1 I=3	<ul style="list-style-type: none"> Stakeholder roles are detailed clearly in the stakeholder involvement plan, which was developed at project development stage during the consultative processes (2 Regional Steering Committees) in Mauritius and Seychelles 	Project Manager			No change

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#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
					(Project Formulation Grant II). <ul style="list-style-type: none"> This plan will be presented and confirmed during the Inception Workshop 				
6.	Current climate and seasonal variability and/or hazard events result in poor results for the coral restoration.	07 August 2017	Environmental	Sever bleaching may occur for long duration thus decreasing the success rate of coral survival in the restoration sites. P = 3 I = 5	<ul style="list-style-type: none"> Climate change (bleaching) resilient species will be used as far as possible. Coral colonies will be transplanted of appropriate size to reduce risk of hazard impact from predators. Diversity in transplanted coral colonies will reduce this risk 	MBEMRFS MEECC			No change
7.	Delays in fund transfers and procurement of technical services and equipment	07 August 2017	Financial	Late funding (slow transfer of funds) or limited absorptive capacity for the programme (UNDP/MBEMRFS/MEECC) may delay some activities, and have a knock-on effect, as outputs from one component are required for the initiation of other components.	<ul style="list-style-type: none"> Project activities have been designed and paced to ensure a reasonable chance of completion over five years (a timeframe less than this would be too ambitious); the PMU will provide required 	Project Manager			No change

Multi Year Work Plan:

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
				P = 2 I = 4	oversight for management of project inputs. <ul style="list-style-type: none"> • Bridging arrangement could be considered between the project and National Institutions in case there are delays. 				

Multi Year Work Plan:

Annex H. RESULTS OF THE CAPACITY ASSESSMENT OF THE PROJECT IMPLEMENTING PARTNER AND HACT MICRO
ASSESSMENT

See enclosed document

Annex I. ENDORSEMENT LETTERS

See enclosed document

Multi Year Work Plan:

Annex J. GRIEVANCE MECHANISM

The proposed project will utilize the existing UNDP grievance mechanism (known as Stakeholder Response Mechanism) to allow the affected to raise concerns that the proposed project is not complying with its social or environmental policies or commitments. It will be the responsibility of the PMU and National Project Teams to ensure that all relevant stakeholders are adequately informed of the grievance mechanism. The Grievance mechanism will be housed in UNDP. The focal point of the grievance mechanism would be Mr. Satyajeet Ramchurn, Head of Environment Unit in Mauritius and Mr Roland Alcindor, Program Manager in Seychelles.

The Regional Project Manager, Project Assistant and Financial Assistant or the Responsible Parties (in Mauritius and Seychelles) are usually the first point of contact for any project-related complaints from stakeholders. The PMU and project team should respond promptly and appropriately to a complaint. The different steps involved in the Stakeholders Response Mechanism (RSM) is described in the flow chart in figure below

Anyone could raise concern on the project. This mechanism considers the special needs of different groups as well as gender consideration and potential environmental and social risks. A combination of mailboxes (at project site), confidential persons in the community and telephoning options offer an immediate way for employee, community and public affected by the project to safely express their concerns. It will also be possible to raise their concerns through Facebook, twitter, or email.

The address and e-mail address of the Adaptation Fund will also be made public (i.e. on project website, Facebook and mailbox) for anyone to raise concerns regarding the project:

Adaptation Fund Board secretariat
Mail stop: MSN P-4-400
1818 H Street NW Washington DC
20433 USA
Tel: 001-202-478-7347
Email: afbsec@adaptation-fund.org

The Adaptation Fund Board Secretariat will receive a copy of any complaint received and a report describing how the grievance has been addressed.

Project staff will be trained in procedures for receiving messages and on the reporting of any grievances. In addition, monitoring activities allow project participants to voice their opinion or complaints as they may see fit.

Multi Year Work Plan:

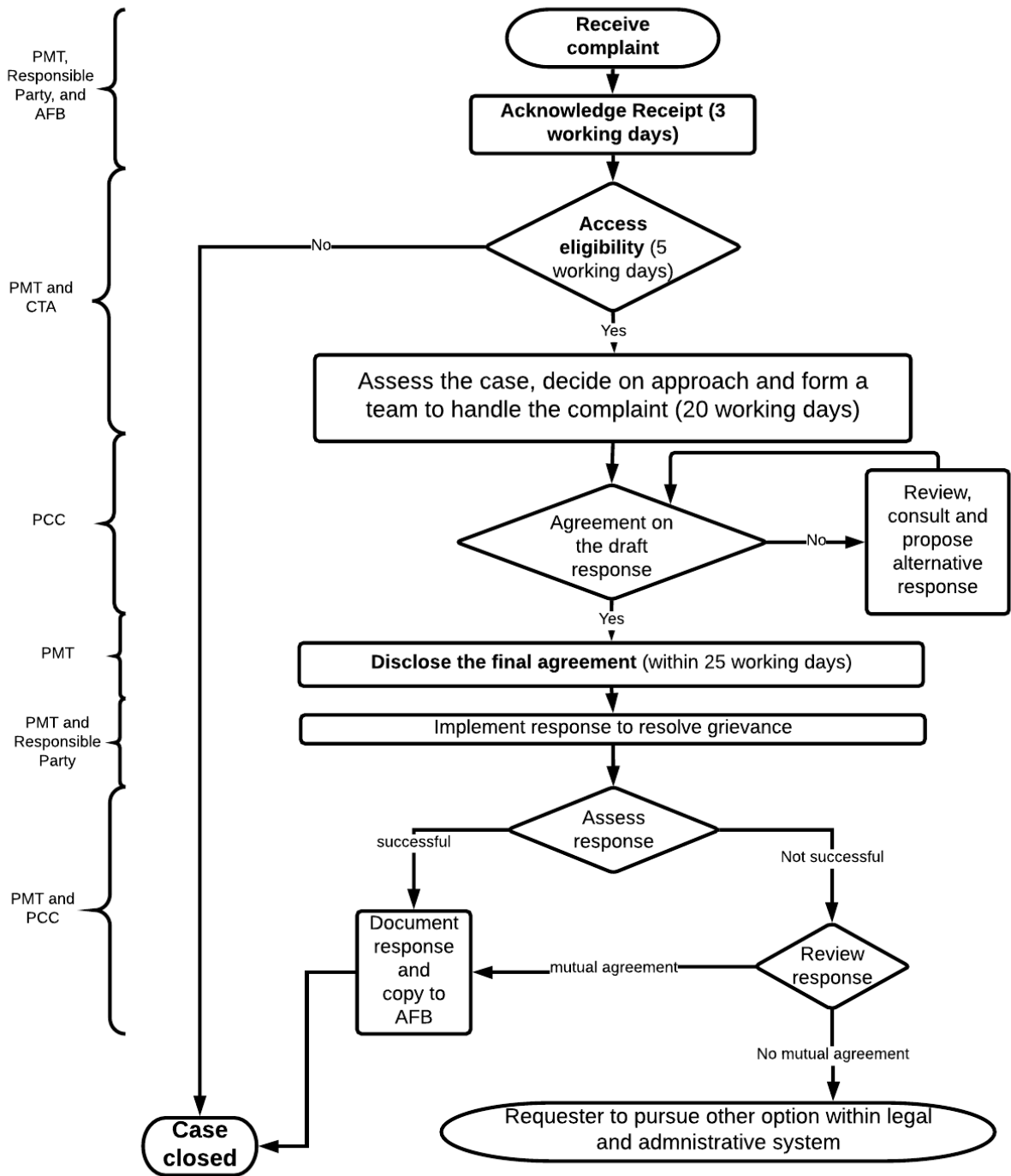


Figure: Workflow for the RSM mechanism following a complaint

Multi Year Work Plan:

Annex K. REPORT OF STAKEHOLDER MEETINGS

See enclosed document

Annex L. COMMUNITY DEVELOPMENT PLAN – MAURITIUS

See enclosed document

Annex M. COMMUNITY DEVELOPMENT PLAN – SEYCHELLES

See enclosed document

Annex N. YOUTH AND GENDER ASSESSMENT AND ACTION PLAN – MAURITIUS

See enclosed document

Annex O. YOUTH AND GENDER ASSESSMENT AND ACTION PLAN - SEYCHELLES

See enclosed document

Annex P. BACKGROUND INFORMATION ON CORAL REEF RESTORATION.

See enclosed document

Multi Year Work Plan:

Annex Q. ASSUMPTIONS OF THEORY OF CHANGE.

Expected Outcomes/Outputs	Internal Factors	External Factors
Component 1: Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius		
Outcome 1.1: Improved livelihood for a sustainable partnership and community-based approach to reef restoration	Non-edible/non-commercial reef fishes may increase fish biomass recorded at restored sites without increasing CFPD	Coastal communities have successfully completed the training provided and are participating fully throughout the duration of the project Boat operators are not from the coastal communities
Outcome 1.2: Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals	Favourable weather conditions (incl. no El Nino events experience) do not cause bleaching of aqua-cultured resilient species, allow the timely completion of surveys and collection of coral spawn from the wild during spawning seasons The actual survival rate of coral fragments is as per estimated survival rates based on past studies and research undertaken by MOI	Timely delivery and availability of necessary equipment for nursery setup Preliminary findings on list of coral species suitable for culture in Mauritius is available. Personnel of the MOI has been effectively trained for clade analysis Community members involved until the end of the project - low turnover
Outcome 1.3 The health of degraded reefs restored, through active restoration work, maintenance and monitoring efforts, leading ultimately to greater protection of shore from flooding and storm damage	Favourable weather conditions allow the timely completion of surveys, transplantation of corals, maintenance and monitoring of restored sites	Adequate capacity built to undertake coral reef monitoring programme
Component 2: Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Seychelles		
Outcome 2.1: Improved livelihood for a sustainable partnership to coral reef restoration	Reef fish community will increase at a similar or higher rate as in the Reef Rescuers project at the restored site Reef fish will eventually spill over from the restored sites (marine reserves) to nearby sites	Stakeholders are interested in undertaking new business approach & enabling national environment for coral based and mariculture based businesses Participants are willing to be trained in coral reef restoration and have successfully completed the training provided Seychelles economy remains stable, tourism remains at same

Multi Year Work Plan:

Expected Outcomes/Outputs	Internal Factors	External Factors
		level or higher, so the business plan is implemented as written
<p>Outcome 2.2 Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals</p>	<p>Land and sea-based nurseries operational and producing sufficient coral stock for transplantation</p> <p>Species selection is science-based</p> <p>Favourable weather conditions allow the timely completion of surveys and allow ideal coral growth in nurseries</p> <p>The survival rate of coral fragments in the land nursery and ocean nurseries is similar or better than the survival rate in past ocean nurseries (75 %) implemented by Nature Seychelles</p> <p>No major mass bleaching events, or crown-of-thorns & Drupella snail invasions during project period</p>	<p>Timely delivery and availability of necessary equipment to build land nursery and ocean nurseries</p> <p>List of local thermal tolerant coral species available</p> <p>Land based nursery will work for production of coral sexual recruits; availability of necessary workers, equipment and materials to build land-based nursery</p> <p>Staff is capable of triggering coral spawning under land-based nursery conditions because no mass spawning from wild corals has been detected in Seychelles</p> <p>Low turnover for community members and staff involved until the end of the project</p> <p>Scientific diver volunteers change every 3 months</p> <p>Community member, staff and volunteers learn to work together through the project lifetime</p>
<p>Outcome 2.3 The health of degraded reefs restored, through active restoration work, maintenance and monitoring efforts, leading ultimately to greater protection of shore from flooding and storm damage</p>	<p>The survival and growth rates of transplanted corals is similar or better than in previous Reef Rescuers project;</p> <p>No major events (climate, tsunami), mass bleaching events, or crown-of-thorns & Drupella snail invasions during project period</p> <p>Favourable weather conditions allow the timely completion of</p>	<p>Adequate capacity built to undertake coral reef monitoring programme</p>

Multi Year Work Plan:

Expected Outcomes/Outputs	Internal Factors	External Factors
	<p>surveys, transplantation of nursery grown corals and monitoring of restored sites</p> <p>The restored reefs will provide ideal habitat to increase fish populations (species, abundance) and other reef-associated species over the project lifetime</p>	
Component 3: Knowledge management and sharing, training and sensitization to build regional capacity for sustainable reef restoration		
<p>Outcome 3.1 Improved understanding and knowledge management of use of reef restoration as an adaptation measure</p>	<p>Reports on past and current coral reef restoration projects locally and in the region readily available</p> <p>Literature on coral reef restoration selection criteria accessible</p> <p>Reports on past and current coral reef restoration projects locally readily available</p>	<p>Sensitisation materials successfully disseminated to the right target audience</p> <p>Studies and Research papers on coral reef restoration methodology accessible</p> <p>Studies, Reports and Research papers on coral reef restoration initiatives in the region and globally available and accessible</p> <p>Capacity of key stakeholders on coral reef restoration techniques and coral genetics analysis including clade analysis built</p>
<p>Outcome 3.2 Improved understanding within the WIO and globally of successful approaches to reef restoration, the constraints and challenges, with lessons learned incorporated into new initiatives</p>	<p>Capacity of stakeholders built on preparation of research papers</p> <p>Systematic monitoring and documentation of the coral reef restoration process at each stage</p>	<p>Commitment of stakeholders to produce research papers documenting the findings of the coral restoration initiative</p> <p>Active participation and collaboration of the key stakeholders of coral reef restoration for the timely drafting of the coral reef restoration Toolkit manual</p>
<p>Outcome 3.3 Regional capacity developed for sustainable and climate resilient coral restoration</p>	<p>Members have successfully completed the training provided</p> <p>Recruitment of a consultant or sponsored training to an international genetic facility (with advanced knowledge in coral genetics)</p>	<p>Timely delivery and availability of additional lab equipment</p> <p>Commitment of all stakeholders to undertake their respective roles and responsibilities as spelt out in the Coral Monitoring programme</p>

Multi Year Work Plan:

Expected Outcomes/Outputs	Internal Factors	External Factors
	Basic and advanced training in coral reef monitoring by a local/regional consultant	

Multi Year Work Plan:

Annex R. LOCATION MAP OF RESTORATION SITES

See enclosed document

Annex S. PROCUREMENT PLAN

See enclosed document

Annex T. LETTERS OF AGREEMENT

See enclosed document

(draft need approval and signature)

Annex U. PROJECT PROPOSAL AS SUBMITTED TO AF AND RELEVANT ANNEXES

See enclosed document