



ADAPTATION FUND



**ENVIRONMENTAL AND SOCIAL
IMPACT ASSESSMENT**
*RESTORING MARINE ECOSYSTEM SERVICES
BY REHABILITATING CORAL REEFS TO MEET
A CHANGING CLIMATE FUTURE*

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Executive Summary

The “Restoring Marine Ecosystem Services by Restoring Coral Reefs to Meet a Changing Climate Future” Regional Project was approved in October 2018, and aims to reduce the adverse impact of climate change on local communities and coral reef-dependent economic sectors in Mauritius and Seychelles. The project will increase climate resilience at both regional and local levels by implementing coral reef restoration with thermal tolerant corals as a form of adaptation to climate change. The objectives of the project 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.

The project is funded by the Adaptation Fund (AF), with UNDP serving as the AF Implementing Entity. UNDP will assure the administrative and financial management of the project. The Executing Partner for the Republic of Mauritius will be the Ministry of Blue Economy, Marine Resources, Fisheries, and Shipping (MOBEMRFS), 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. To assist the Executing Partner in the implementation of the project at the community/local level, UNDP will recruit two NGOs in Mauritius and one in Rodrigues. The Executing Partner for the Republic of Seychelles will be the Ministry of Agriculture, Climate Change and Environment (MACCE), which has the mandate for environmental, climate change and energy policy and management.

This ESIA was commissioned by UNDP and covers the scope of all project components and their subsequent activities. The ESIA was carried out under the requirements of UNDP’s Social and Environmental Standards, and the applicable host country law and legislation in both the Republic of Mauritius and the Republic of Seychelles. No activity within the Project will be permitted that does not adhere to the applicable safeguard requirements.

The purpose of this ESIA is to identify the potential positive and adverse environmental and socio-economic effects that may arise from the Project, identify the measures to be used to manage, mitigate, and monitor the impact of those effects, and to assess the residual impact following mitigation. Impacts are to be assessed using the environmental and social baseline conditions as a point of departure.

In addition to identifying and assessing impacts, measures required to avoid, prevent, mitigate or compensate significantly adverse impacts and enhance beneficial impacts have also been included as an integral part of the ESIA. Reference is made to plans to monitor, manage and evaluate the implementation of mitigation measures and the Project’s performance in terms of environmental and social baseline conditions.

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1.0 Introduction and Structure of the ESIA

As per UNDP (and, by extension, AF) requirements, UNDP's Social and Environmental Screening Procedure (SESP) was undertaken for this project resulting in an overall "moderate" risk categorization. According to the 2015 SESP guidelines, a project is considered to have "moderate" risk when it "includes activities with possible social and environmental risks and adverse impacts that are of limited range, that can be determined with a reasonable level of certainty, and that can be addressed through the application of optimum practices and standard mitigation measures as well as the involvement of key stakeholders during implementation of said project". As a consequence of this risk rating, it was decided that an ESIA should be undertaken to further assess the environmental and social risks that were initially identified in the SESP.

The purpose of this ESIA is to identify the potential positive and adverse environmental and socio-economic impacts that may arise as a consequence of undertaking the respective project activities, identify the measures to be used to manage, mitigate, and monitor the impact of those effects, and to assess the residual impact following mitigation. Impacts are to be assessed using the environmental and social baseline conditions as a point of departure. Due to COVID-19 travel restrictions, this ESIA was conducted virtually, with support provided by the UNDP Mauritius and Seychelles Country Office teams.

The potential impact of any activity will depend on the nature, location and specific mode of activity by the given project implementor. In most cases, for this project, adverse environmental and social impacts are expected to be temporary and limited to the immediate vicinity of the project/activity site.

The ESIA report is organised as follows:

Chapter 1: Introduction

This chapter provides background information about the Project and highlights the objectives and scope for the impact assessment study as well as the applicable regulatory framework for the proposed project.

Chapter 2: Legal, regulatory and Institutional Framework

This chapter provides a description of the applicable regulatory framework for the proposed project

Chapter 3: Project Description

This chapter provides a description of the Project, including location, project components and activities, details of Project inputs and outputs

Chapter 4: Baseline Data

This chapter describes the available baseline data on the environment and social resources and receptors within the project study area.

Chapter 5: Siting

This chapter presents key information on the specific interventions sites that have been chosen (for both nurseries and restoration activities) within the framework of the project. It also includes key consideration and criteria that should be assessed during finalization of site selection.

Chapter 6: Assessment of risks and impacts

In this chapter, potential and associated environmental and social impacts of project activities are identified, assessed and evaluated.

Chapter 7: Alternatives Analysis

This chapter assesses potential alternatives to the project siting, activities and implementation arrangements. It includes evaluating the 'no project' alternative.

Chapter 8: Mitigation and Management measures

This chapter presents potential mitigation and management measures as they pertain to the impacts identified in chapter 6.

Chapter 9: Stakeholders

This chapter outlines the results of the stakeholder engagement activities undertaken so far.

Chapter 10: Appendices

This includes the project's ESMP, the SESP, minutes and records from key stakeholder meetings.

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2.0 Legal, Regulatory, and Institutional Framework

2.1 Domestic Legislative Framework: Republic of Seychelles

2.1.1 General Environmental Legislation

A. Constitution of the Republic of Seychelles 1993

Article 38 of the Constitution of the Republic of Seychelles reads that 'the State recognises the right of every person to live in and enjoy a clean, healthy and ecologically balanced environment and, with a view to ensuring the effective realisation of this right the State undertakes: (a) To take measures to promote the protection, preservation and improvement of the environment...'¹. Article 40 further provides for a fundamental duty of every citizen of Seychelles to (among other things) protect, preserve, and improve the environment².

B. The Environment Protection Act, No. 18 of 2016 (EPA 2016) – General Provisions

The EPA 2016 provides for the protection, improvement, and preservation of the environment and facilitates the setting of objectives and principles aimed at protection of the environment, human health and abatement of pollution in line with national priorities and international obligations³. Administrative authority ('the Authority') under the EPA 2016 is granted to the Ministry or Department of the Government under the Minister responsible for the Environment, currently the Ministry of Agriculture, Climate Change, and Environment (MACCE)⁴.

The functions of the Ministry for the purposes of this Act are to⁵:

- Administer, implement, and enforce the provisions of this Act
- Develop and implement policies, programmes and guidelines in pursuance of the national objectives on environmental protection
- Co-ordinate climate-related activities of other agencies
- Develop standards for the quality of the environment including emissions and pollutant standards
- Commission and sponsor environmental research
- Examine processes likely to cause environmental pollution
- Identify protected areas in which activities shall be restricted
- Develop safeguards procedures; and,
- Collection and dissemination of environmental information.

¹ The Constitution of the Republic of Seychelles, Article 38

² The Constitution of the Republic of Seychelles, Article 40

³ Environment Protection Act 2016 (No. 18 of 2016), long title

⁴ Environment Protection Act 2016 (No. 18 of 2016), ss 3, 4

⁵ Environment Protection Act 2016 (No. 18 of 2016), s 4

2.1.2 Conservation and Pollutant Legislation

A. Pesticides Control Act 1996⁶

The Pesticides Control Act 1996 provides for restrictions on the sale, use, possession, and storage of various substances designated as pesticides under Schedule I. The 1996 Act also outlines the relevant offences and enforcement related to the listed pesticides. As such, this project must adhere to the prohibitions specified in the 1996 Act. Continuous monitoring of water quality as listed in Appendix I, ESMP is a mitigating measure serving to limit the risk of contravening this Act. Monitoring of water quality will also be continually required as part of the project's E&S Impact Monitoring Plan.

B. Wild Animals and Birds Protection Act 1961

This Act allows the relevant Minister to make regulations for the protection of wild animals and birds, generally such regulations relate to the killing, possession, sale or purchase of animals specified in regulations made under the Act⁷. The Regulations made under this Act that are relevant to this project are listed directly below.

C. Regulations made under the Wild Animals and Birds Protection Act 1961

The Wild Animals (Turtles) Protection Regulations 1994 prohibit the disturbing, injuring, killing and sale of any turtle⁸. As such, appropriate measures must be taken to ensure that this project does not interfere with wild turtles. Training will be provided to responsible parties directly involved in the project to ensure general protection of the natural habitat. Should any displacement of living species be necessary, it will be undertaken in the presence of the relevant authority.

D. Animal and Plant Biosecurity Act 2014

This Act aims to prevent the introduction of animal and plant pests and diseases into Seychelles⁹. The aforementioned training and testing of water quality, biodiversity and other environmental parameters will serve to mitigate risks of detriment to biological diversity/security and prevent contravention of this Act.

E. Environment Protection (Standards) Regulations, SI No. 84 1995

The Environment Protection (Standards) Regulations 1995 prescribe the maximum concentration of a variety of substances considered to be an acceptable discharge of effluents. This project will undertake continuous testing of water quality to ensure adherence to the maximum concentrations of effluents listed in these Regulations.

⁶ Pesticides Control Act 1996 (No. 14 of 1996), Cap 164A

⁷ Wild Animals Protection Act 1961 (No. 37 of 1961), Cap 247, s 2

⁸ Wild Animals (Turtles) Protection Regulations 1994 (S.I. 46 of 1994)

⁹ Animal and Plant Biosecurity Act 2014 (No. 10 of 2014)

2.1.3 Environmental Impact Assessment Legislation

A. The Environment Protection Act, No. 18 of 2016 (EPA 2016) – Part IV Environmental Impact Assessment Provisions

Section 44(1) of the EPA 2016 outlines the requirement to receive Environmental Authorisation for 'developments' defined in the preceding section (use of the sea, as determined by the Minister, qualifies as such a 'development'), 'prescribed projects', or any project in an ecologically sensitive area as prescribed under the EPA 2016 or any other Act¹⁰. The granting or refusal of such authorisation is assessed with reference to the Environmental Impact Assessment (EIA) Class I or Class II (as determined by the Authority¹¹) conducted for the project or development¹².

Schedules I and II of the Environment Protection (Impact Assessment) Regulations 1996 outline in further detail the types of projects and sensitive areas within which any planned project must undertake an EIA¹³.

Section A.1 of Schedule II of the 1996 Impact Assessment Regulations states that any area designated under section 5 of the National Parks and Nature Conservancy Act 1969, or the Protected Areas Act 1967 falls within the requirement to undertake an EIA¹⁴. Section B.6 of Schedule II of the 1996 Impact Assessment Regulations designates the seabed as an area falling within the requirement to undertake an EIA.

The proposed implementation sites of Curieuse Marine National Park, Cousin Special Reserve, and Ste. Anne Marine National Park are designated as protected areas by Regulations made under the National Parks and Nature Conservancy Act 1969. This project also involves interaction with the seabed, which is itself a designated ecologically sensitive area listed in Schedule II of the 1996 Impact Assessment Regulations. As such, to obtain Environmental Authorisation, this project must undertake an EIA compliant with sections 45-47 of the EPA 2016 and the Environment Protection (Impact Assessment) Regulations 1996 for review.

B. Environment Protection (Impact Assessment) Regulations, S.I. No. 39 1996

As mentioned above, Schedules I and II of these Regulations outline the relevant project types and sensitive areas that qualify a project for the requirement to undertake an EIA as provided for in Part IV of the EPA 2016 (see above).

Pursuant to Regulation 6(1) of the 1996 Impact Assessment Regulations, the Authority will undertake a scoping exercise following a meeting of the Project Proponent and the Authority to discuss the project and to list the stakeholders to be consulted. The resulting EIA report will be publicized in accordance with Regulation 8(1)¹⁵.

¹⁰ Environment Protection Act 2016 (No. 18 of 2016), s 44(1)

¹¹ Environment Protection (Impact Assessment) Regulations 1996 (S.I. No. 39 of 1996), Regulation 5

¹² Environment Protection Act 2016 (No. 18 of 2016), ss 45-47

¹³ Environment Protection (Impact Assessment) Regulations 1996 (S.I. 39 of 1996), regulation 3

¹⁴ Environment Protection (Impact Assessment) Regulations 1996 (S.I. 39 of 1996), Sch. 2

¹⁵ Environment Protection (Impact Assessment) Regulations 1996 (S.I. 39 of 1996), Regulations 6-8

2.1.4 Zoning and Protected Area Legislation

A. National Parks and Nature Conservancy Act, No. 16 1969

This Act provides for the establishment of a Commission to designate and manage areas as National Parks, Strict Nature Reserves, Special Reserves, or Areas of Outstanding Natural Beauty¹⁶. Designation orders are made under this act to specify areas falling within one of these categories.

The proposed implementation sites of Curieuse Marine National Park, Cousin Special Reserve, and Ste. Anne Marine National Park are each designated as one of these types of protected areas under the secondary legislation listed directly below.

It must be noted that a new Nature Reserves and Conservancy Act is due before the end of the year. This project is expected to comply with all provisions of national law, including the provisions of this forthcoming act.

B. Designation Orders under The National Parks and Nature Conservancy Act 1969

The Designation Orders relevant to this project are:

- **The National Parks and Nature Conservancy (Designation of Special Reserve) (Cousin Island) Order 1979**
- **National Parks (Curieuse Marine) (Designation) Order 1979**
- **The National Parks (Ste. Anne Marine) (Designation) Order 1973**

These designation orders refer directly to planned implementation sites for this project. The result of this is that an EIA is required for this project pursuant to the Environment Protection (Impact Assessment) Regulations 1996 Sch. 2 and Section 44(1) of the EPA 2016.

C. Protected Areas Act 1967

The Protected Areas Act 1967 provides for Presidential declaration of protected areas that no unauthorised person may enter while such a declaration is in force. Such a declaration may be made if it 'appears to the President to be necessary or expedient in the public interest...'¹⁷. Existing protected areas are listed in the Schedule attached to the Act. No intended implementation sites for this project are currently listed as protected under this Act.

D. Town and Country Planning Act 1972

The Town and Country Planning Act 1972 establishes a Town and Country Planning Authority to manage land development plans. After having forwarding to the MACCE a copy of an application for environmental authorisation made to the Town and Country Planning Authority, '...the Town and Country Planning Authority shall...have regard to a grant or refusal of an environmental

¹⁶ National Parks and Nature Conservancy Act 1969 (No. 16 of 1969), Cap 141, s 5

¹⁷ Protected Areas Act 1967 (No. 10 of 1967), Cap 185, s 3

authorisation in respect of that application' when exercising other powers under the Town and Country Planning Act¹⁸.

This provision operates such that the granting or refusal of environmental authorisation for this project generally may be relevant to further determinations made by the Planning Authority regarding land-based coral nurseries and other on shore facilities planned for this project.

E. Maritime Zones Act 1999

The Maritime Zones Act 1999 provides, among other things, for the exclusive and sovereign jurisdiction of Seychelles over the exploitation, conservation, management of nautical resources and the seabed within Seychelles' territorial waters and the 'exclusive economic zone'. Such jurisdiction includes the right to construct and to authorise and regulate the construction, operation and use of installations for the exploitation, conservation, and management of nautical resources and the seabed within the 'exclusive economic zone'. Exclusive jurisdiction to protect the marine environment and control marine pollution is also provided for in the 1999 Act¹⁹.

This Act states that a person may not carry out any search or excavation, conduct any research, construct any installation, structure, or device, or carry out any economic activity other than under or in accordance with an agreement with Seychelles under Seychellois law²⁰. Pursuant to the provisions within this Act, this project must be undertaken only under or in accordance with an agreement with Seychelles under Seychellois law (such as the Environmental Authorisation process listed above).

F. Regulations made under the Maritime Zones Act 1999

The Maritime Zones (Marine Pollution) Regulations 1981 provide for various offences relating to the discharge of oil and oily mixtures into a prohibited sea, listed in the Schedule (namely the territorial waters of Seychelles)²¹. As such, appropriate measures must be undertaken to prevent oil discharge into the territorial waters of Seychelles during the implementation of this project and regular water quality testing will be undertaken to ensure continued compliance.

2.1.5 Employment Legislation

A. Constitution of the Republic of Seychelles 1993 and International Labour Law

Section 17 of the Constitution of the Republic of Seychelles provides that every person has a right not to be held in slavery or compelled to perform compulsory labour²². As listed in the Appendix I, ESMP, the PMT and National Project Teams will be ensuring compliance with all relevant national and international labour laws (listed below) including this forced labour prohibition.

¹⁸ Environment Protection (Impact Assessment) Regulations 1996 (S.I 39 of 1996), Regulation 4

¹⁹ The Maritimes Zones Act 1999 (No. 2 of 1999), Cap 122, s 10

²⁰ The Maritimes Zones Act 1999 (No. 2 of 1999), Cap 122, s 25

²¹ Maritime Zones (Marine Pollution) Regulations 1981, Regulation 3

²² Constitution of the Republic of Seychelles, s 17

B. Employment Act 1995

This project must abide by all relevant provisions of the Employment Act 1995 and subsidiary legislation made thereunder such as the Employment (Conditions of Employment) Regulations 1991, and Employment (National Minimum Wage) Regulations 2007 (as amended) listed below.

Mitigating measures and the associated indicators relating to non-discrimination, minimum employment age, and national minimum wage in this project are outlined in the Appendix I, ESMP.

Section 46A of the Employment Act 1995 provides for the ability of a worker to submit and have investigated a complaint that their employer has made an employment decision relating to them on grounds of the worker's age, gender, race, colour, nationality, religion, disability, HIV status, sexual orientation or political, trade union or other association²³.

C. Regulations made under the Employment Act 1995

Employment (Conditions of Employment) Regulations 1991 - Regulation 3 of the Employment (Conditions of Employment) Regulations 1991 states that the maximum number of working hours permissible is (generally) 60 hours per week or 12 hours a day, whichever is less²⁴. An employer is required to grant workers at least 24 hours consecutive rest in any period of 7 days and at least 8 hours between shifts²⁵. Regulation 21 provides for the minimum employment age of 15 years old²⁶.

Employment (National Minimum Wage) Regulations 2007 (as amended) - Regulation 3 of the Employment (National Minimum Wage) Regulations 2007 (as amended) states that an employer shall pay a worker a national minimum wage of R38.27 for every hour of service or a casual worker a national minimum wage of R44.10 for every hour of service²⁷.

D. Occupational Safety and Health Decree 1978

Section 4 of the Decree provides for a duty on every employer to ensure the health, safety, and welfare at work of all employees. This duty includes: (i) provision and maintenance of plant and systems that are safe; (ii) making arrangements for ensuring safety and absence of health risks; (iii) provision of instruction, training and supervision as is necessary to ensure health and safety of employees; and, (iv) provision of protective equipment and training as to how to use such equipment²⁸.

Section 32 of the Decree provides that an employer or person in charge of the premises shall inform the Director of any accident or dangerous occurrence within 48 hours of such an event.

²³ Employment Act 1995 (No. 2 of 1995), Cap 69, s 46A

²⁴ Employment (Employment Conditions) Regulations 1991 (S.I. 34 of 1991), Regulation 3

²⁵ Employment (Employment Conditions) Regulations 1991 (S.I. 34 of 1991), Regulation 4

²⁶ Employment (Employment Conditions) Regulations 1991 (S.I. 34 of 1991), Regulation 21

²⁷ Employment (National Minimum Wage) Regulations 2007 (S.I. 55 of 2007), Regulation 3 as amended by the Employment (National Minimum Wage) (Amendment) Regulations 2019

²⁸ Occupational Safety and Health Decree 1978, Cap 151, s 4

Any physician attending a person with an injury associated with the occupations listed in Part V of the Schedule shall inform the Chief executive of the Ministry responsible for the administration of the Employment Act²⁹. Relevant to this project listed in Part V of the Schedule are Diving and Compressed Air Operations³⁰.

All provisions of the Occupational Safety and Health Decree 1978 must be complied with in the implementation of this project. Mitigating measures outlined in the Appendix I, ESMP include: PMT and National Project Teams ensuring compliance with the relevant health and safety laws; provision of adequate protection equipment and training (advanced training for diving activities); insurance; and access to medical decompression chambers.

Table 1 in the Appendix I ESMP describes the identified labour rights risks in specified project activities. The management and mitigation measures for these risks are outlined in the same section, with further detail to be provided in the OHS/construction risk matrix and the diver safety management plan.

2.2 Domestic Legislative Framework: Republic of Mauritius and Rodrigues

2.2.1 General Environmental Legislation

A. Environment Protection Act 2002 (EPA 2002) – General Provisions

The EPA 2002 provides for the protection and management of the environmental assets of Mauritius to ensure that their capacity to sustain the society and its development remains unimpaired. The Act also provides the base legal framework and mechanisms for protection of the natural environment, facilitates inter-governmental cooperation on environmental issues and seeks to ensure the proper implementation of environmental policies³¹.

Section 4 and Part XII of the EPA provide for the application of this Act to the island of Rodrigues and other islands under the jurisdiction of the State of Mauritius. Part XII also provides for the ability of the Rodrigues Regional Assembly (RRA) to make Regulations applicable to the island of Rodrigues under this Act³². Regulations made by the RRA relating to the zoning and designation of protected areas (within which this project has planned implementation sites) are listed below.

Part II of the EPA 2002 establishes for the administration of this Act, a National Environment Commission consisting of the Prime Minister as chair, and other Ministers listed in the First Schedule³³.

The EPA 2002 also establishes a Department of Environment (DoE), Police de l'Environment, Technical Advisory Committee, and Multilateral Environmental Agreements Coordinating Committee.

²⁹ Occupational Safety and Health Decree 1978, Cap 151, Sch, Part V and s 32(4)

³⁰ Occupational Safety and Health Decree 1978, Cap 151, Sch., Part V, (o)

³¹ Environment Protection Act 2002 (No. 19 of 2002), long title

³² Environment Protection Act 2002 (No. 19 of 2002), s 4 and Part XII

³³ Environment Protection Act 2002 (No. 19 of 2002), s 5

2.2.2 Conservation and Pollutant Legislation

A. Environmental Protection Act 2002 (EPA 2002)

Section 32 of the EPA 2002 provides for the liability of the owner of a pollutant discharged by spilling. Any person affected in any way by a spill has the right to damages from the owner of the pollutant³⁴. As such, appropriate measures must be undertaken to ensure that no pollutants are spilled during the implementation of this project.

Part VI of the EPA 2002 provides for the relevant Minister to establish standards by Regulation relating to the protection of water quality, effluent limitations, waste in any form, and pesticide residues³⁵. The relevant Regulations made under this Part are listed below.

Table 1 in the Appendix I ESMP lists the identified risks and associated mitigation and management measures relating to protection of natural habitats. The ESMP also states that more detail regarding the monitoring of compliance with mitigation measures will be provided in the E&S Impact Monitoring Plan (Under development).

B. Regulations made under the Environment Protection Act 2002 (EPA 2002)

Environment Protection (Standards for Effluent Discharge into Ocean) 2003 – This Regulation provides that no person shall discharge effluent into the ocean unless in compliance with the attached Schedule or at a distance of at least 300 metres off the reef barrier.

Environment Protection (Standards for Hazardous Wastes) Regulation 2001 – This Regulation provides that no person shall dispose of hazardous waste at any place except at a disposal site.

Appropriate measures must be taken to ensure compliance with the above pollutant Regulations and the EPA 2002 provisions under which they have been made.

2.2.3 Environmental Impact Assessment Legislation

A. Environment Protection Act 2002 (EPA 2002)

Section 15 of the EPA 2002 prohibits the undertaking of any activity prescribed in the attached Fifth Schedule parts A and B without an EIA license³⁶. Section 17 further provides that where the Minister considers a project is likely to have an impact on the environment or on the zoning of an area, they may request the undertaking of an EIA despite the prescribed activity not falling within the prescribed project types in the Schedules³⁷. Sections 18-27 outline the requirements of an application for and the effects of an EIA license.

³⁴ Environment Protection Act 2002 (No. 19 of 2002), s 32

³⁵ Environment Protection Act 2002 (No. 19 of 2002), part VI

³⁶ Environment Protection Act 2002 (No. 19 of 2002), s 15

³⁷ Environment Protection Act 2002 (No. 19 of 2002), s 17

The Fifth Schedule Part A includes coral crushing and processing and mechanical removal of marine flora as undertakings requiring a preliminary environmental report, however, these activities do not fall under the scope of the Project. The Fifth Schedule Part B Item No 31 concerns modification of existing coastline such as beach reprofiling, coastal protection works and removal of basaltic and beach rock. A requirement for projects relating to coral reef rehabilitation to undertake an EIA is nowhere directly mentioned.

With regard to Section 17 of EPA 2002 on non-listed activity, such activity depends on the nature, scope, scale and impacts (mainly negative) on the environment. In case the Minister decides that such activity will require an EIA licence, adequate reasons for substantiating the requirement for an EIA should be provided. This project concerns coral reef rehabilitation which is believed to be positive for the environment. Activities involving coral reef rehabilitation (within the auspices of this project) have not triggered the need for an EIA licence.

2.2.4 Zoning and Protected Area Legislation

A. Fisheries and Marine Resources (Maritime Protected Areas) Regulations 2001

The Fisheries and Marine Resources (Maritime Protected Areas) Regulations 2001 are made under the Fisheries and Marine Resources Act 1998. General provisions relevant to this project are the prohibitions in Part III of these Regulations regarding; (i) building or placing any structure and removal of natural substances without a license in a Marine Protected Area; and (ii) discharge of any polluting substance or damage to marine flora and fauna³⁸. Further potentially relevant restrictions regarding carrying out of research, introduction of any animal or plant to an MPA without a license and interference with structure in MPAs are listed in Regulations 8-10. Coral reef farming/restoration (as outlined in the project's logframe) is defined as an activity that does not warrant an EIA as per the 5th Schedule of the EPA. It should be noted that carrying out coral reef restoration in Marine Protected Areas requires Interference Permits for setting up of coral nurseries as per the Fisheries and Marine Resources (MPA) Regulations 2001 and amended Regulations 2007.

B. Rodrigues Regional Assembly (Fisheries and Marine Resources – Marine Protected Areas) Regulations 2009

These Regulations made by the Rodrigues Regional Assembly (RRA) provide for similar prohibitions as in the Fisheries and Marine Resources (Maritime Protected Areas) Regulations 2001 above for areas within the RRA's remit. Schedule I delimits the South East Marine Protected Area (SEMPA) (another planned implementation site of this project) and designates the delimited area as an MPA. Further detail is added to the zoning of the SEMPA in the Rodrigues Regional Assembly (Fisheries and Marine Resources – The South East Marine Protected Area) Regulations 2011³⁹.

³⁸ Fisheries and Marine Resources (Maritime Protected Areas) Regulations 2001, Regulation 5

³⁹ Rodrigues Regional Assembly (Fisheries and Marine Resources – Marine Protected Areas) Regulations, 2009, Schedule I; Rodrigues Regional Assembly (Fisheries and Marine Resources – The South East Marine Protected Area) Regulations 2011.

2.2.5 Employment Legislation

The Appendix I, ESMP outlines the mitigating measures to be taken to prevent contravention of national and international labour laws in the implementation of this project. Monitoring of labour law compliance and sufficient training and supervision will be undertaken by the PMT and National Project Teams. The relevant national labour legislation is nonetheless outlined briefly below.

A. The Constitution of the Republic of Mauritius

Section 6 of the Constitution of the Republic of Mauritius provides for protection from slavery and forced labour. Section 16 provides for protection from discrimination *by any person acting in the performance of a public function* based on race, caste, place of origin, political opinions, colour, creed or sex (emphasis added)⁴⁰.

B. Worker's Rights Act 2019

In addition to the provisions of the Constitution regarding non-discrimination by public officials, the Worker's Rights Act 2019, Section 5 states that no employer shall treat a person in their employment, or in respect of access to employment, in a discriminatory manner⁴¹. For this provision, 'discrimination' includes affording different treatment based on age, race, colour, caste, creed, sex, sexual orientation, gender, HIV status, impairment, marital or family status, pregnancy, religion, political opinion, place of origin, and national extraction or social origin⁴². This prohibition is also supplemented by the Equal Opportunities Act 2008.

Section 8 of the Worker's Rights Act 2019 provides that no person shall employ a child (person under the age of 16). Section 9 further provides that no person shall employ a young person (between ages 16 and 18) for work which is likely to jeopardise their health, safety, or physical, mental, moral or social development, or is otherwise unsuitable for young persons⁴³.

Some positions within this project (namely those involving diving and use of compressed air – see Occupational Safety and Health Act 2005 below) may involve risks and manners of work making them unsuitable for young persons pursuant to the above provisions of the Worker's Rights Act 2019.

Section 20 provides that the normal working week shall consist of 45 hours work. No worker shall be made to work more than 12 hours per day, and a worker shall be entitled to a rest day of at least 24 consecutive hours in every period of 7 days. Every worker shall be entitled to rest of not less than 11 consecutive hours in any day⁴⁴.

⁴⁰ Constitution of the Republic of Mauritius, Articles 6, 16

⁴¹ Worker's Rights Act 2019 (No. 20 of 2019), s 5

⁴² Worker's Rights Act 2019 (No. 20 of 2019), s 5(5)

⁴³ Worker's Rights Act 2019 (No. 20 of 2019), ss 8, 9

⁴⁴ Worker's Rights Act 2019 (No. 20 of 2019), s 20

As mentioned above, Table 1 in the Appendix I ESMP describes the identified labour rights risks in specified project activities. The management and mitigation measures for these risks are outlined in the same section, with further detail to be provided in the OHS/construction risk matrix and the diver safety management plan.

C. National Minimum Wage Regulations 2017 (as amended in 2019, 2021)

The national monthly minimum wage payable to any worker other than a part-time worker in a non-export enterprise for the calendar year ending 31 December 2021 has been revised to Rs 10,075⁴⁵. The national minimum wage payable to every part-time worker (other than a *garde-malade*) is (Rs 10,075/195) x (number of hours worked in a month) x (1.10)⁴⁶.

D. Occupational Safety and Health Act 2005

Section 5 of the Occupational Safety and Health Act 2005 provides that every employer shall ensure the safety, health and welfare at work of their employees. In particular, an employer is required to: (i) provide and maintain a working environment and any plant or systems of work under their control; (ii) ensure that use and storage of articles and substances is safe and without health risks; (iii) provide instruction, training and supervision as is necessary to ensure the safety of employees at work; and (iv) ensure that any person not in their employment is not exposed to any health risk by nature of the work undertaken⁴⁷.

Section 8 prohibits the employment of young persons in particular activities. Relevant to this project is 'work in compressed air or in confined spaces', prohibited under Section 8(i)⁴⁸. As such, this project must not employ young persons (aged between 16 and 18 years) for any roles involving diving or the use of compressed air.

As prescribed for by the Occupational Safety, Health and Welfare (First-aid) Regulations 1989 (as amended), proponents of this project overseeing employees shall ensure that a suitably located first-aid box containing the items listed in the First Schedule attached to this Regulation⁴⁹.

⁴⁵ National Minimum Wage (Amendment) Regulations 2021, Regulation 3

⁴⁶ National Minimum Wage Regulations 2017, as amended by the National Minimum Wage (Amendment No. 2) Regulations 2019 and National Minimum Wage (Amendment) Regulations 2021.

⁴⁷ Occupational Safety and Health Act 2005 (No. 28 of 2005), s 5

⁴⁸ Occupational Safety and Health Act 2005 (No. 28 of 2005), s 8

⁴⁹ Occupational Safety, Health and Welfare (First-aid) Regulations 1989

2.3 International Obligations

The Republic of Seychelles, and the Republic of Mauritius (and by extension, Rodrigues) are party to a variety of Multilateral Environmental Agreements (MEAs) and Conventions regarding labour regulation. The most important of which (for the context of this project) are listed below.

A. Environment

- United Nations Framework Convention on Climate Change (UNFCCC)
- Convention on Biological Diversity (CBD)
- Stockholm Convention on Persistent Organic Pollutants (POPs)
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
- CITES
- International Plant Protection Convention (IPPC)
- Geneva Convention on the High Seas 1958
- United Nations Convention on the Law of the Sea (UNCLOS)
- International Convention for the Prevention of Pollution from Ships (MARPOL) London 1973 (Annexes I-VI)
- International Convention on Civil Liability for Oil Pollution Damage
- International Convention on the establishment of an International Fund For Compensation For Oil Pollution Damage
- South Indian Ocean Fisheries Agreement (SIOFA)
- Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (the Nairobi Convention) 1996
- Convention on the Conservation of Migratory Species of Wild Animals (CMS) (The Bonn Convention 1979)
- African Convention on the Conservation of Nature and Natural Resources
- Indian Ocean Southeast Asian Sea Turtle Agreement

B. Labour

- United Nations Convention on the Rights of the Child
- ILO Convention Number 138 on Minimum Age for Admission to Employment, 1973
- ILO Convention Number 182, on Worst Forms of Child Labour 1999
- ILO Convention Number 111, on Discrimination (Employment and Occupation) 1958
- ILO Number 29, Forced Labour Convention 1930

2.4 Applicable UNDP Social and Environmental Safeguards Policies

UNDP's Social and Environmental Standards (SES) are applied to all UNDP projects. The application of the SES will help mitigate potentially high adverse environmental and social impacts stemming from the selection and implementation of subprojects.

UNDP's SES came into effect in January 2015. The SES underpin UNDP's commitment to mainstream social and environmental sustainability in its programmes and projects to support sustainable development.

The objectives of the standards are to:

- Strengthen the social and environmental outcomes of programmes and projects
- Avoid adverse impact to people and the environment
- Minimize, mitigate, and manage adverse impacts where avoidance is not possible
- Strengthen UNDP and partner capacities for managing social and environmental risks
- Ensure full and effective stakeholder engagement, including through a mechanism to respond to complaints from project-affected people.

The SES are an integral component of UNDP’s quality assurance and risk management approach to programming. This includes the Social and Environmental Screening Procedure (SESP) (see the completed SESP for the project in Appendix II)

Table 1: Key Elements of UNDP’s SES

Overarching Policy	Project-Level Standards	Policy Delivery Process & Accountability
Principle 1: <u>Human Rights</u>	Standard 1: <u>Biodiversity Conservation and Sustainable Natural Resource Management</u>	Quality Assurance
Principle 2: <u>Gender Equality and Women’s Empowerment</u>	Standard 2: <u>Climate Change Mitigation and Adaptation</u>	Screening and Categorization
Principle 3: <u>Environmental Sustainability</u>	Standard 3: <u>Community Health, Safety and Working Conditions</u>	Assessment and Management
	Standard 4: <u>Cultural Heritage</u>	Stakeholder Engagement and Response Mechanism
	Standard 5: <u>Displacement and Resettlement</u>	Access to information
	Standard 6: <u>Indigenous Peoples</u>	Monitoring, Reporting, and Compliance Review
	Standard 7: <u>Pollution Prevention and Resource Efficiency</u>	

2.5 Regulatory Gap Identification

This project will adhere to the host country, international, and UNDP requirements listed above. Should any conflict arise relating to the respective stringency of particular requirements, the most stringent of the conflicting requirements will apply, in accordance with UNDP best practice. However, no major regulatory gaps or divergences have been discovered during the process of conducting this ESIA.

3.0 Project Description

3.1 Project Overview

The Regional UNDP-AF project on “Restoring marine ecosystem services by rehabilitating coral reefs to meet a changing climate future” (CRR) for Mauritius and Seychelles was approved by the Adaptation Fund in October 2018. The Local Project Appraisal Committee met in December 2019 in Seychelles to formally endorse the project and its objectives. Due to Covid-19 and other unforeseen delays, the Delegation of Authority (DOA) for the project was received in June 2020 and the project document was signed by UNDP in the same month.

3.2 Objectives

The overall objective of the project 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 a form of adaptation to climate change and its future potential impacts.

There are three specific objectives of the project, the first two objectives are addressed by interventions in each country, and the third objective is regional:

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, in order to restore their essential ecosystem services;
2. 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; and
3. 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.

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 levels by implementing coral reef restoration with thermal tolerant corals as a form of adaptation to climate change.

3.3 Project Components, Outcomes, Outputs and Activities

The project consists of four components:

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

Associated with the four components, the project has 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.

As a result of the outcomes, the expected impacts are three-fold:

- (i) Full community and business involvement in coral reef restoration;
- (ii) Improved livelihoods with increased fish landings and access to new job opportunities; and
- (iii) A standardized science-based approach (and implementation) to coral reef restoration in Mauritius, Seychelles, and the Western Indian Ocean (WIO) region.

Table 2: Project Overview

Component	Outcome	Output	Activities
Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Mauritius (Component 1)	Improved livelihood for a sustainable partnership and community-based approach to reef restoration	Coastal communities benefit from improved livelihoods through employment via establishing and maintaining coral nurseries and transplantation sites.	<ul style="list-style-type: none"> - <i>Stakeholder analysis</i> - <i>Training of community members in establishing and maintaining coral nurseries in Mauritius and Rodrigues</i> - <i>Awareness campaign on coral restoration in Republic of Mauritius</i> - <i>Training of direct beneficiaries in snorkelling and advance PADI or other relevant diving qualifications.</i>
		Coastal communities benefit from improved livelihoods through increased revenue from alternative work including tourism (glass bottom boat tours, snorkelling and diving trips)	<ul style="list-style-type: none"> - <i>Development of a coral restoration economic and financial strategy.</i> - <i>Establishing partnership agreement with community group</i> - <i>Livelihood survey to evaluate impact of project on beneficiaries.</i>
	Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals	Donor coral colonies of appropriate species (resilience, maintaining genetic diversity) available at sufficient scale (quantity, time, intervals etc.) for propagation in nurseries	<ul style="list-style-type: none"> - <i>Technical assessment and selection of resilient coral species. Identification of donor sites</i> - <i>Survey for identification of ocean-based nurseries</i>
		Reports on coral reef status, water quality, and other key environmental and social	<ul style="list-style-type: none"> - <i>Monitoring of sea water quality and other key environmental parameters at donor and nursery sites.</i>

Component	Outcome	Output	Activities
		parameters for potential nursery sites	<ul style="list-style-type: none"> - <i>Carrying out the Environmental and Social Impact Monitoring.</i>
		A land-based nursery and 2 or more ocean nurseries established and maintained on a regular basis.	<ul style="list-style-type: none"> - <i>Setting up of a large-scale land-based nursery at MOI</i> - <i>Setting up, populating and maintenance of 100 table nurseries and 100 multi-layered rope nurseries in BBMP</i> - <i>Setting up, populating and maintenance of 50 table nurseries and 40 multi-layered rope nurseries in SEMPA</i>
		Stock of farmed corals available for transplantation.	<ul style="list-style-type: none"> - <i>Collection of coral fragments cultures in land-based nurseries and ocean-based nurseries in Mauritius and Rodrigues</i>
	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	Rugosity and structure of reefs restored, leading ultimately to greater protection of shore from erosion.	<ul style="list-style-type: none"> - <i>Transplantation of farmed corals at restoration sites in Mauritius and Rodrigues</i> - <i>Part of the spatio-temporal study of the coast and restoration site in Mauritius and Rodrigues.</i>
		Recovery of fish population and other reef associated fauna and flora, leading ultimately to improved food security in Mauritius and Rodrigues.	<ul style="list-style-type: none"> - <i>Monitoring and maintenance of the restoration sites</i> - <i>Monitoring of the restoration site for water quality, live coral cover, fish and other fauna and flora density.</i> - <i>Updating the inventory of the corals in Mauritius and updating the booklet describing</i>

Component	Outcome	Output	Activities
			<i>the corals of Mauritius and Rodrigues</i>
<i>Enhancement of food security and reduction of risks from natural disasters through the restoration of degraded reefs in Seychelles (Component 2)</i>	Improved livelihood for a sustainable partnership to coral reef restoration	Coastal communities benefit from improved livelihoods through employment establishing and maintaining coral nurseries and transplantation sites.	<ul style="list-style-type: none"> - <i>Training of community members in establishing and maintaining coral nurseries</i> - <i>Awareness campaign in Seychelles on coral restoration</i> - <i>Scuba training of volunteer students.</i>
		Coastal communities benefit from improved livelihoods through increased revenue from alternative work including tourism (glass bottom boat tours, snorkelling and diving trips)	<ul style="list-style-type: none"> - <i>Development of a Business Plan and update of MPA strategic plan.</i>
	Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals	Donor coral colonies of appropriate species (resilience, maintaining genetic diversity) available at sufficient scale (quantity, time, intervals etc.) for propagation in nurseries.	<ul style="list-style-type: none"> - <i>Technical assessment and selection of resilient coral species.</i> - <i>Identification of donor sites</i> - <i>Survey for identification of sea-based nurseries</i>
		Reports on coral reef status, water quality, and other key environmental and social parameters for potential nursery sites	<ul style="list-style-type: none"> - <i>Monitoring of sea water quality and other key environmental parameters at donor and nursery sites.</i> - <i>Carrying out the Environmental and Social Impact Monitoring</i>

Component	Outcome	Output	Activities
		A land-based nursery established, and 2 or more ocean nurseries are established and maintained on a regular basis.	<ul style="list-style-type: none"> - <i>Setting up of a land-based nursery on Praslin</i> - <i>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.</i>
		Stock of farmed corals available for transplantation.	<ul style="list-style-type: none"> - <i>Collection of coral fragments cultures in land-based nursery in Praslin and ocean-based nurseries in Ste Anne, Cousin and Curieuse Islands.</i>
	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	Rugosity and structure of reefs restored, leading ultimately to greater protection of shore from erosion	<ul style="list-style-type: none"> - <i>Transplantation of farmed corals at restoration sites in Curieuse Island, Cousin Island, Ste Anne Island and Anse Forbans</i>
		Recovery of fish population and other reef associated fauna and flora, leading ultimately to improved food security in Seychelles.	<ul style="list-style-type: none"> - <i>Monitoring and maintenance of the restoration sites</i> - <i>Monitoring of the restoration site for water quality, live coral cover, fish and other fauna and flora density.</i>
Knowledge management and sharing, training and sensitization to build regional capacity for sustainable reef restoration (Component 3)	Improved understanding and knowledge management of use of reef restoration as an adaptation measure	Comparative review and analysis of coral reef restoration initiatives in the region and globally, with gaps in knowledge identified	<ul style="list-style-type: none"> - <i>Comprehensive review of coral reef restoration in the region and globally.</i>

Component	Outcome	Output	Activities
		<p>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.</p>	<ul style="list-style-type: none"> - <i>Development and publishing of methodology/guidelines for coral restoration in Mauritius and Seychelles, based on past restoration efforts, best available science and practices.</i>
		<p>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)</p>	<ul style="list-style-type: none"> - <i>Study in genetic connectivity among Mauritius, Rodrigues and Seychelles</i> - <i>Study in the coral spawning and recruits in Mauritius, Rodrigues and Seychelles</i> - <i>Study in the identification of bleaching resistant clades of zooxanthellae.</i>
	<p>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>Lessons learned in coral reef restoration documented and shared</p>	<ul style="list-style-type: none"> - <i>Creation and maintenance of project website</i> - <i>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.</i> - <i>Participation in relevant international symposium.</i>
		<p>Coral Reef Restoration Tool Kit</p>	<ul style="list-style-type: none"> - <i>Updating and online publishing of the Coral</i>

Component	Outcome	Output	Activities
		and manual for use in the WIO, published and disseminated	<i>Reef Restoration Toolkit</i>
	Regional capacity developed for sustainable and climate resilient coral restoration	Regional training workshops undertaken on monitoring, DNA-based approach for the identification of resilient corals, and other topics as appropriate	<ul style="list-style-type: none"> - <i>Regional training on genetic/clade analysis</i> - <i>Regional training on coral farming and transplantation</i> - <i>Regional training on micro-fragmentation</i> - <i>Feasibility study of setting up of genetic laboratory in Seychelles.</i>
		Sustainable long-term monitoring programme developed and underway for restored reefs, based on international / regional protocols and best practice	<ul style="list-style-type: none"> - <i>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.</i> - <i>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.</i> - <i>Review the legislative and legal framework of each country</i> - <i>Preparation of a Regional Coral Reef Restoration Plan.</i>

4.0 Baseline Data

Note: Due to COVID-19 travel restrictions, this ESIA was conducted virtually, with support provided by the UNDP Mauritius and Seychelles Country Office teams, and relevant Activity partners/project stakeholders. As a consequence, this ESIA report relies upon secondary data sources for the establishment of the baseline/receptor environment data.

4.1 Geographic Context

The project will be implemented in the Republic of Seychelles and the Republic of Mauritius and Rodrigues. 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.

Mauritius⁵⁰

The Republic of Mauritius (RoM) 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 (Fig. 1).

The island of Mauritius is volcanic in origin and is almost entirely surrounded by coral reefs. Situated 619 km to the east of Mauritius, Rodrigues Island is hilly with a central spine culminating in its highest point, Mont Limon (393 m). Rodrigues is the only Mascarene Island with extensive limestone deposits and caves. Rodrigues is characterised by a drier climate than Mauritius and frequently faces droughts, which affect agricultural production.

The Republic of Mauritius is also situated in the tropical cyclone belt of the South Western Indian Ocean (SWIO) where rapid formations of high intensity tropical cyclones and super cyclones have been observed.

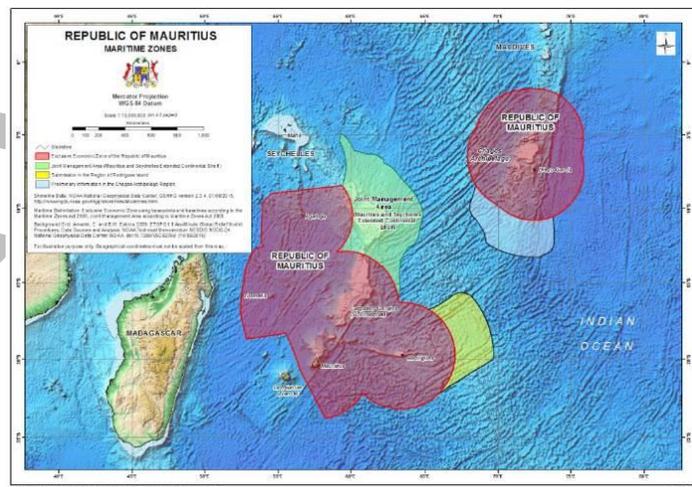


Figure 1: Geographical location of Mauritius and Outer Islands with the EEZ (light red), Joint Management Area - Mauritius and Seychelles Extended Continental Shelf (light green), Extended Continental Shelf Submission to the UN Commission on the Limit of the continental shelf (CLCS) in the region of Rodrigues (yellow) and Preliminary Information in the Chagos Archipelago Region (light blue)

⁵⁰ Republic of Mauritius (2016). Third National Communication: Report to the United Nations Framework Convention on Climate Change. Republic of Mauritius, Port Louis. 210 pp.

The annual losses from cyclones and associated wind, flood and storm surge hazards are estimated to be USD 91 million, representing 8% of all-natural hazards assessed for Mauritius⁵¹. It is therefore highly exposed to such extreme climatic phenomenon with serious risks to life and development progress including basic amenities and properties.

Seychelles⁵²

The Republic of Seychelles is an island archipelago located between latitudes 4° and 11° S and longitudes 46° and 57° E, about 1,600 km east of Kenya. It has 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. These islands are rocky, and most have a narrow coastal strip and a central range of hills up to 914 m high. 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 (Figure 2).

Just under 50% of land area in the Seychelles has been set aside/designated as protected areas/natural reserves. The climate is tropical oceanic, with little temperature variation during the year. Daily temperatures rise to the low 30° C in the afternoon and fall to the low 20° C at night. Precipitation levels vary greatly from island to island; on Mahé, annual precipitation ranges from 2,300 mm at sea level to 3,560 mm on the mountain slopes.

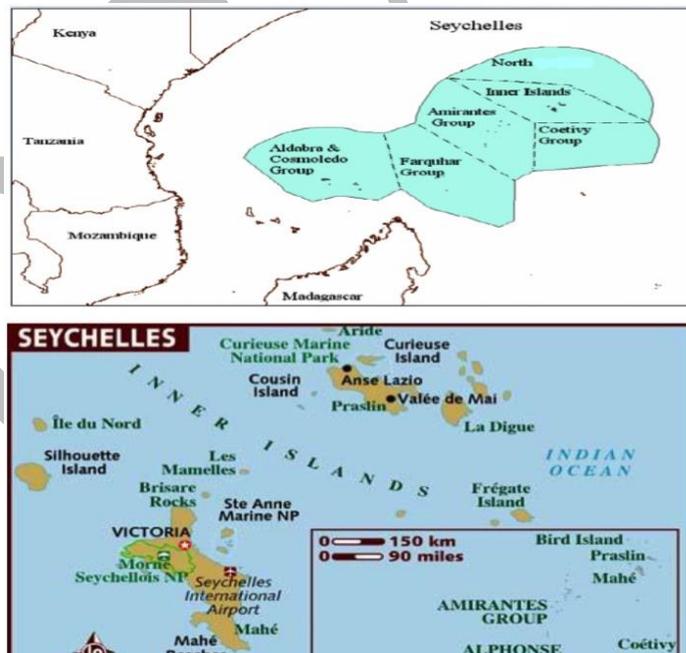


Figure 2: Geographical location of Seychelles. Top: Seychelles Archipelago. Bottom: Inner and Outer Islands

⁵¹ Southwest Indian Ocean Risk Assessment and Financing Initiative “Disaster Risk Profile Mauritius” 2016

⁵² 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.

Humidity is persistently high but is ameliorated somewhat in locations windward of the prevailing southeast trade winds. Seychelles is located within the equatorial region, and while the islands are rarely directly impacted by tropical cyclones, they are indirectly affected by them via the intensification of the intertropical convergence zone and spinal rain bands associated with storms passing south. This leads to impacts through intense rains and swells and storm surges⁵³.

4.2 Biophysical

Coral Reefs

Mauritius and Seychelles lie within the Indian Ocean centre of diversity for corals. The most recent analysis⁵⁴, incorporating earlier studies⁵⁵, indicates that the reefs of the two countries fall into three ecoregions, on account of their different coral faunas:

- the Mascarene Islands,
- the northern Seychelles (predominantly the granitic islands surrounded by nearshore fringing reefs), and
- the southern Seychelles (predominantly the outer islands, which are largely atolls).

The northern Seychelles and the Mascarenes have a slightly lower diversity than the southern Seychelles, but nevertheless, have over 350 species (Fig. 3).

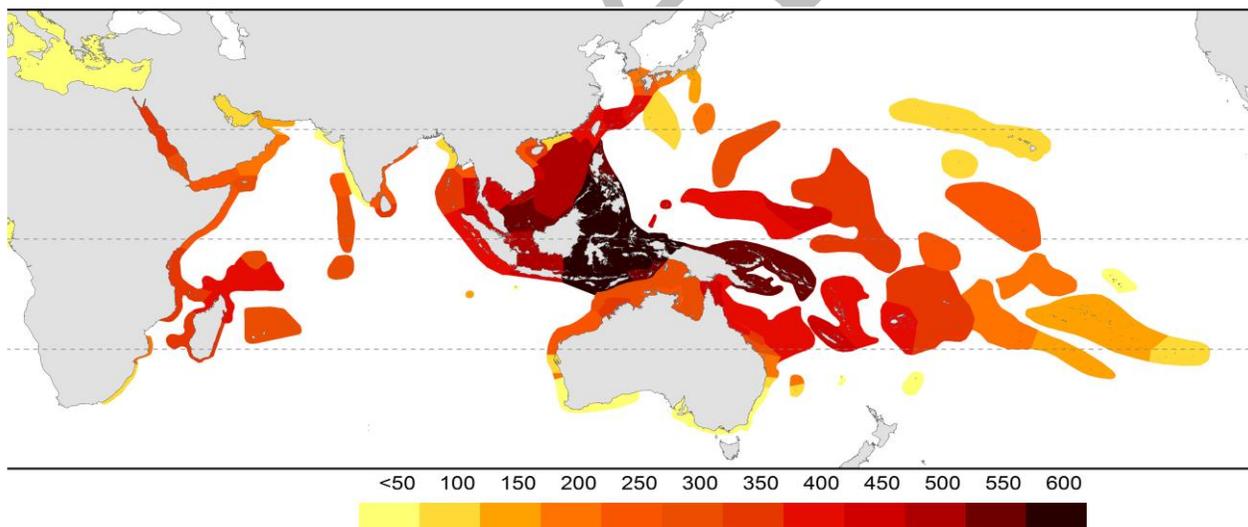


Figure 3: Global diversity indicated by all records of occurrences. Colours indicate number of coral species found in each area (see bar below map)

Reef building corals are made of millions of tiny animal polyps living in symbiosis with microscopic algae. The algae (zooxanthellae) live inside the gut of the animal polyp. During daylight hours, zooxanthellae produce sugars through photosynthesis, which feed the animal polyp providing 90

⁵³ UNDP, 2008, "Disaster Risk Profile of the Seychelles"

⁵⁴ J Veron, M Stafford-Smith, Lyndon DeVantier and Turak, E. 2015. Over view of distribution patterns of zooxanthellae Scleractinia *Frontiers in Marine Science* 1(81).

⁵⁵ Obura D (2012) The Diversity and Biogeography of Western Indian Ocean Reef-Building Corals. *PLoS ONE* 7(9): e45013. doi: 10.1371/journal.pone.0045013

% of its energy needs. At night, the polyp extends its tentacles and feeds on plankton. The algae give their host corals their unique colours (Fig. 4). It is this animal-algae symbiosis that allows corals to live in the nutrient poor waters of the tropics and speeds up the production of calcium carbonate to form reefs. However, when the water temperature rises 2° C above the maximum temperatures normally experienced by the corals, the polyps expel the zooxanthellae turning the coral white. This event is known as coral bleaching. If the warming is brief, corals can reabsorb the zooxanthellae and survive. If the warming event lasts for more than two weeks, corals die of starvation.



Figure 4: Close-up of coral polyps (translucent white), with symbiotic zooxanthellae (golden green dots) living inside the gut of the polyps. The calcium carbonate chalice where coral polyps hide during the day is shown on the lower left corner. Photo credit: Smithsonian Institution

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. The artisanal fishery of each country relies primarily on catches of reef-associated species and, although not necessarily of high monetary value, these fisheries are a key to the health, food and income security of coastal communities. The total abundance of demersal fish (and hence potential fisheries productivity) is strongly associated with the amount of live hard coral cover.⁵⁶ Similarly, the tourism industry in each country has developed primarily on account of the reefs, which not only provide the snorkelling and diving experiences that visitors specifically seek out, but also the white sandy beaches that in many parts of these islands are formed from the natural erosion of coral colonies. In both countries, the overwhelming majority of capital investments in the tourism sector are located on the coast for this reason; for example, in Mauritius, of the total 115 hotels in 2015, over 90% were on the coast⁵⁷.

⁵⁶ e.g. 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

⁵⁷ Ministry of Tourism and External Communications

4.3 Socio-economic Context

Mauritius

Mauritius has a population of 1.26 million, of which around 97% live on the main island and the rest on Rodrigues⁵⁸. Population density on Mauritius island is high (641 people per km²), and even higher when tourist arrivals are included: the country had over 300,000 tourist arrivals in 2020, though this reflects a 77% decrease from the previous year due to the Covid-19 Pandemic⁵⁹. Rodrigues has a much lower density of 399 people/km², although this is still high in global terms.

Cumulative economic growth over recent decades has meant that Mauritius has moved from classification as a Low Income to an Upper Middle-Income country with a 2020 Per Capita GDP of USD 8,622⁶⁰. The Mauritian economy has diversified since the mid-1990s, when the sugar and textile sectors were dominant and, although both these sectors are still important, the offshore financial sector, a rapidly growing information, communication and technology (ICT) industry and the expanding ports sector are now key to the national economy. Sustained growth of the economy has been possible due to several factors such as political stability; stable institutions; an outward market-driven strategy; prudent fiscal, exchange rate, trade, investment and monetary policies; and the careful overall planning, and policy choices.

Despite these successes, several important challenges remain. Mauritius has been facing slightly increasing inequality levels in recent years, with the Gini coefficient rising from 0.388 in 2007 to 0.400 in 2017⁶¹. The unemployment rate has decreased slightly from 7.9% in 2016 to 6.7% in 2019⁶².

Seychelles

The Seychelles has a population of 98,963 people. Seychelles has a high Human Development Index (HDI) value of 0.796, positioning the country at 67 out of 189 countries⁶³. Seychelles had a 2020 Per Capita GDP of USD 11,425⁶⁴; it ranks high on human development indicators such as life expectancy, primary school enrolment (100%), and adult literacy rate (over 90%). Once a largely agricultural economy (cinnamon and coconut), the Seychelles is now a dual economy, heavily dependent on tourism and fishing which are the main production sectors and, like Mauritius, it has a growing offshore financial sector.

Despite this positive development, Seychelles continues to face a number of challenges. Since the beginning of the 1990s, Official Development Assistance flows have fallen by over 90%. This situation and the increased need to borrow from commercial institutions, has led to a slowdown of the economy. Above all, the country suffers from insufficient economic diversifications and vulnerability to external shocks, including climate change.

⁵⁸ Statistics Mauritius – Available at:

https://statsmauritus.govmu.org/Pages/Statistics/ESI/Population/Pop_Vital_Yr20.aspx

⁵⁹ Statistics Mauritius – Available at: https://statsmauritus.govmu.org/Slider/SitePages/Tourism_Yr20.aspx

⁶⁰ <http://data.worldbank.org/country/mauritius> as against current USD; Statistics Mauritius states the Per Capita GDP at the time of writing (July 2021) at USD 8535.48

⁶¹ *Mauritius in Figures 2019* - Statistics Mauritius pg 23

⁶² *Mauritius in Figures 2019, 2016* – Statistics Mauritius pg 17

⁶³ *The Next Frontier: Human Development and the Anthropocene* – UNDP Human Development Report 2020

⁶⁴ <http://data.worldbank.org/country/seychelles> as against current USD

Protected Areas in the Seychelles have been established since the 1970's for multiple reasons. Mostly, however, they are to protect biodiversity where it is most abundant or vulnerable and/or to protect land and sea scape values. To date, more than 47% of the total land area of the Seychelles is under legal protection. These protected areas currently fall under different pieces of legislation. Protected areas are regulated under different pieces of legislation, notably the National Parks and Nature Conservancy Act (1969, as amended), the Wild Animals and Birds Protection Act (1961), the Wild Birds Protection (Nature Reserves) Regulations (1966), Fisheries Act (1987), Environment Protection (Impact Assessment) Regulations (1996) and the Protected Areas Act (1967). Some of these protected areas have management plans. Activities are regulated, and no fishing is allowed in the Protected Areas.

The inshore domestic fisheries of the Inner Islands of the Republic of Seychelles are currently fully exploited and may be locally overexploited. In response to this, MPAs have been advocated as buffers against overfishing. However, the lack of fisheries enforcement is a problem common to all fisheries in Seychelles and most of the MPAs are poached to some degree, despite all being subject to no-take regulations. This is especially true for fishermen based in regions in close proximity to existing MPAs and due to the perception that there is a decline in 'legal' fish available⁶⁵.

4.4 Gender

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.

Mauritius

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 businesses⁶⁶

Seychelles

In Seychelles, the law provides for the same legal status and rights for women as for men, and the society is largely matriarchal.⁶⁷ 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. Women are active in politics at grassroots level and in the labour market. However, their increased penetration in the labour market and politics at all echelons is still a challenge; for example, for

⁶⁵ Wood L (2004) "Motives for poaching in Marine Protected Areas in the Seychelles", Western Indian Ocean, J. Mar. Scie Vol 3, No 2, pp 199-208

⁶⁶ Mauritius (2016) Human Right Report

⁶⁷ Seychelles (2016) Human Right Report

women to participate in the National Assembly as directly elected members, their party must nominate them. At the present time, relatively few women are included on party lists and there has been only one independent woman candidate standing in presidential elections since 1993⁶⁸.

4.5 Climate Change

Mauritius and Seychelles are highly vulnerable to climate change in several ways, specifically the impact that elevated sea surface temperature is having on their coral reefs. Environmental pressures are significant, compounded by climate change and the specificity of being a Small Island Developing State (SIDS). Coral reefs provide a wealth of ecosystem services including food, coastal protection, recreational use, biodiversity benefits, and regulating services, all of which are vital to the local economies and food security of human populations living in vulnerable Small Island Developing States (SIDS) such as these two countries. Healthy and robust coral reefs, through the provision of these ecosystem services, ensure that coastal populations of tropical countries have increased resilience to the adverse impacts of climate change.

Average temperature at all stations in Mauritius is rising at the rate of 0.15 °C per decade and has risen by 0.74-1.2 °C when compared to the 1961-1990 long term mean. Urban area stations have seen rises in even greater amounts. A similar trend can be seen in the data from stations in Rodrigues, with temperatures rising at 0.11 °C per decade and a rise in 0.5-1.0 °C when compared with the 1961-1990 long term mean⁶⁹.

The warming in the Seychelles region, over the period 1972-1997, is estimated to be of the range of 0.25°C. The number of very warm days and nights is increasing dramatically, while the number of very cool days and nights are decreasing. The annual maximum temperature warming in the past 34 years is estimated to be +0.33°C and is linked to the southern summer season. The annual minimum temperature warming in the past 34 years is estimated to be +0.82°C. The minimum temperature is warming faster than maximum temperature as a result of the 'urban heat island' effect and the warming is higher during the southeast monsoon⁷⁰.

The sea surface temperature (SST) observations at the Seychelles International Airport, Pointe Larue, show that SST is characterised by two maxima and minima linked to the transition period associated with the reversal of the monsoon winds and the equatorial ocean currents. The extreme minimum occurs in August at a time when the southeast monsoon is at its peak with the sun in the northern hemisphere. The extreme minimum temperature dropped from 25.8°C in August 2000 to 24.9°C in August 2005. In contrast, the extreme maximum of SST in April 2000

⁶⁸ Seychelles (2017) Report to the Committee on the Elimination of All Forms of Discrimination Against Women

⁶⁹ Mauritius Meteorological Service – Available at: <http://metservice.intnet.mu/climate-services/climate-change.php> – accessed on July 15th, 2021

⁷⁰ World Bank Group Climate Change Knowledge Portal – Available at: <https://climateknowledgeportal.worldbank.org/country/seychelles/climate-data-historical>; 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, pg 178

has warmed up to a maximum of 30.1°C in April 2001 following the 1999-2000 La Nina event⁷¹. In Mauritius, sea surface temperature anomalies have led to coral bleaching events in 1998, 2003, 2004, 2009 and 2015⁷².

Sea level rise has been observed to be accelerating at an average rate of 5.6 mm/year in the last decade for both Mauritius and Rodrigues, much higher than the global average of 3.2 mm/yr. The Republic of Mauritius is also situated in the tropical cyclone belt of the South Western Indian Ocean (SWIO) where rapid formations of high intensity tropical cyclones and super cyclones have been observed. It is therefore highly exposed to such extreme climatic phenomenon with serious risks to life and hard-won development gain, which includes basic amenities and properties. In Seychelles, an annual sea-level trend anomaly of +0.146 has been observed on one monitoring station⁷³. Rising sea level has previously impacted Seychelles through flooding, coastal erosion, and increased salinization of soil. Notable impacts include the combination of high tides and sea level rise causing flooding reaching as far as 50 meters inland in May 2007⁷⁴.

Analysis of rainfall over the period 1951-2014 shows a decreasing trend in rainfall amount of about 8% for Mauritius. For Rodrigues, a water scarce island, a downward trend has also been observed in the rainfall. Over the same period, the central plateau, the main recharge zone of the island, has witnessed a decrease in annual precipitation from a maximum of 4000 mm/year to 3800 mm/year with drying being more pronounced to the north and west. Utilizable water resources are projected to decrease by up to 13% by 2050⁷⁵.

Extreme precipitation and flooding is now of great concern for Seychelles. However, only few studies are available mainly because of an absence of a network of rainfall intensity observation instruments. The existing manual voluntary network of rain gauge only measures 24 hours rainfall. Heavy rainfall events have been the major contributor to the increase in rainfall (Lajoie, 2004). However, further observations and rainfall intensity analysis are recommended to draw firm conclusions. Infrastructure properties, buildings and roads have been affected or damaged due to flooding, erosion and landslide in Mauritius.

Accentuated beach erosion has shrunk the width of beaches around certain coastal areas in Mauritius by up to 10 meters over the eight years. Coral reefs are in a state of deterioration. Sea level has been rising at a rate of 5.6 mm per year since 2003⁷⁶. Most of the exposed locations in Seychelles are being affected by coastal erosion. Coastal erosion may be classified as a major problem especially to those properties, infrastructure and people situated on the coastal plains

⁷¹ 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, pg 183

⁷² Republic of Mauritius (2016). Third National Communication: Report to the United Nations Framework Convention on Climate Change. Republic of Mauritius, Port Louis, pg 51

⁷³ 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

⁷⁴ *Evaluating the Impacts of Sea Level Rise and Storm Surges on Seychelles' Critical Infrastructure*, Xie et Al, 2019

⁷⁵ Ministry of Environment, Solid Waste Management and Climate Change – Available at: <https://environment.govmu.org/Pages/What-is-Climate-Change.aspx>

⁷⁶ Republic of Mauritius (2016). Third National Communication: Report to the United Nations Framework Convention on Climate Change. Republic of Mauritius, Port Louis, pg 26.

and shoreline. Some coastlines have been retreating for a long time. At Anse Kerlan (Praslin) for instance, old resident's estimate that approximately 10,000 square metres of coastlines have been washed away. Erosion-sensitive sites on Mahe and Praslin are being lost at an average of 1-3 m per year (Tsunami Disaster Task Force, 2005; Seychelles Nation, 1998). Increased recession of the coastline also takes place because of the destabilising nature of the high tide levels. Flooding in the low-lying areas becomes more pronounced with the occurrence of storms coinciding with the annual spring tides.

5.0 Siting

5.1 Tentative locations of demonstration sites

As outlined in Section 3, "Project Description" of this ESIA report, the project will include a combination of hard (i.e., physical/on the ground) interventions as well as some 'soft' components/activities (i.e., project management, policy, trainings, workshops, awareness raising etc). The major potential impacts of this project are associated with the hard components, most notably those under Outcomes 1.2 and 2.2.

Coral reef restoration sites and nurseries have been tentatively selected to take place at six locations across the Seychelles, Mauritius and Rodrigues. A brief overview of the tentative sites is presented below.

Seychelles:

In Seychelles, coral reef restoration works will be implemented at:

- Curieuse Marine National Park;
- Cousin Special Reserve;
- Sainte Anne Marine National Park; and, at
- Anse Forbans.

The density of restoration (number of corals per square metre) will depend on the size of corals at transplant time and the status of the degraded reef in question. 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. To preserve the newly transplanted and restored corals/reefs, the project will require certain access and activity restrictions to be in place. 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 activities.

Curieuse Marine National Park

Curieuse Island (fig. 5 and 6) is a small granitic island (2.9 km²) in the Seychelles, close to the north coast of the island of Praslin. In 1979, the Curieuse Marine National Park (which encompasses Curieuse and surrounding waters) was established in order to protect the native wildlife. It is managed by the Seychelles National Parks Authority (SNPA). It is home to a number

of indigenous plants, including the rare coco de mer palms as well as a plethora of animals. Between 1978 and 1982, there was a conservation project to relocate Aldabra giant tortoise from Aldabra to Curieuse. Today there is a volunteer group that focuses on conservation of the island and surveys local fish, coral, turtle and coco de mer numbers. At Curieuse Marine Park, SNPA is aiming to rehabilitate 0.5 hectares of coral reef that is expected to be implemented over six years.

At Curieuse Marine National Park, and as outlined under Output 2.2.2, in addition to the coral restoration activities, a sea-based nursery will be established. The exact siting of the sea-based nursery will be selected based on the reports of coral reef status, water quality and key environmental and social parameters. More guidance/information on siting criteria (as it pertains to social and environmental performance and requirements), is outlined in Section 5.2 of this ESIA report. It is anticipated (Activity 2.2.3.2) that the ocean-based nursery at Curieuse Island will include 20 midwater rope type nurseries, that will be filled with nubbins from asexual propagation and eventually will also include nubbins obtained from sexual propagation in the land-based nursery (i.e. at Praslin Island).

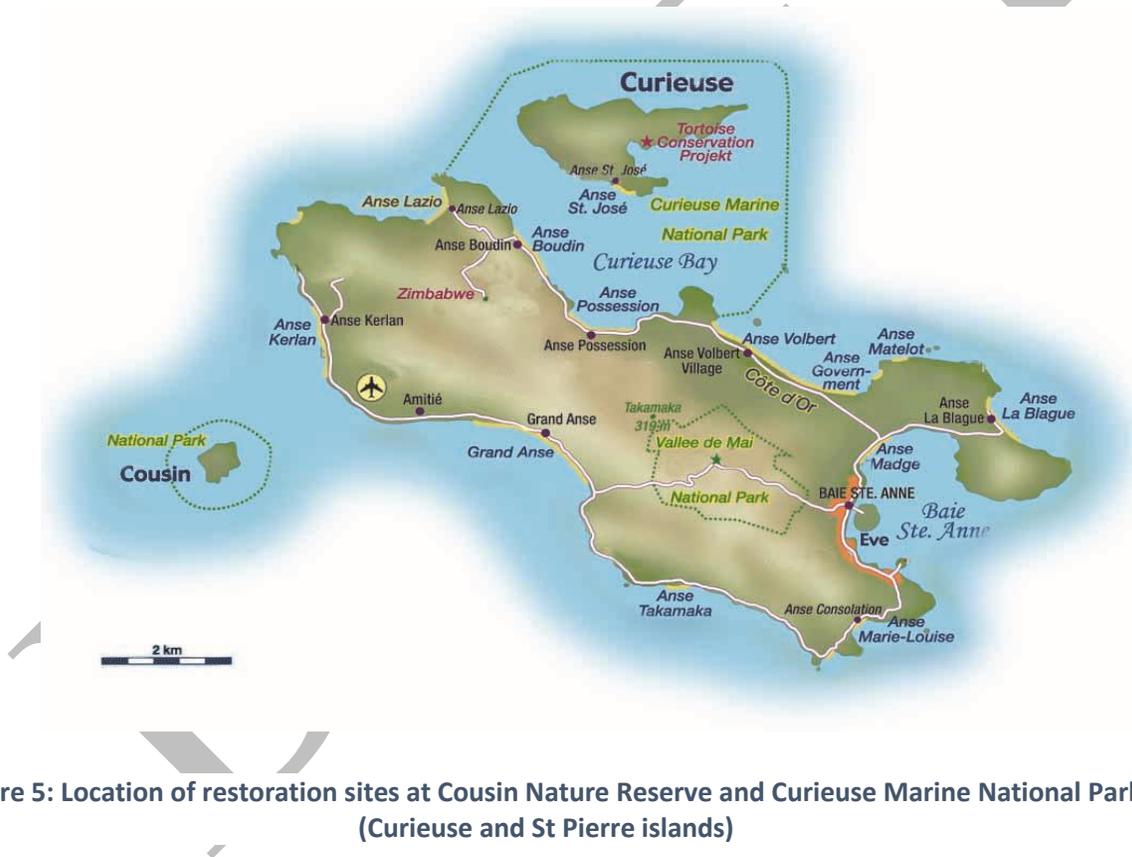


Figure 5: Location of restoration sites at Cousin Nature Reserve and Curieuse Marine National Park (Curieuse and St Pierre islands)

Cousin island Special Reserve

Cousin Island (fig. 5 and 6) is a small (34 ha) granitic island of the Seychelles, lying 2 km west of Praslin. It is a nature reserve protected under Seychelles law as a Special Reserve and is managed by Nature Seychelles, a non-profit organisation. The island was formerly a coconut plantation that had been stripped of much of its native vegetation. The island was declared special reserve in 1975, thus protecting coral reefs, which extends 400 m (1,300 ft.) into the sea from the shoreline. It is used by international research organisations and universities as a research

base. It is a demonstration site for the International Coral Reef Action Network (ICRAN), with the reserve attracting around 10,000 visitors each year.



Figure 6: Location of Curieuse Marine National Park and Cousin Special Reserve

It is anticipated (Activity 2.2.3.2) that the ocean-based nursery at Cousin Island Special reserve will include 10 midwater rope type nurseries, that will be filled with nubbins from asexual propagation and eventually will also include nubbins obtained from sexual propagation in the land-based nursery (i.e. at Praslin Island). During the consideration of nursery siting, the following key elements/lessons learned should be followed:

Table 3: Nursery siting protocol, Lessons learned Cousin Island

1. *Locate areas protected from the winds. In our case, the SE and NW monsoons (the site of the nursery had to change according to the monsoon season),*
2. *Conduct a diving survey to determine the depth and substrate composition suitable for nursery anchoring and construction,*
3. *Quantify the environmental conditions of the site: water clarity, water flux, distance from nearby reefs,*
4. *Assess the relative proximity to the collection and transplantation sites,*
5. *Estimate the advantages and disadvantages in terms of natural and anthropogenic impacts of the site.*

Note : extracted from Frias-Torres, S., P.H. Montoya-Maya, N. Shah (Eds). 2018. Coral Reef Restoration Toolkit: A Field-Oriented Guide Developed in the Seychelles Islands. Nature Seychelles, Mahe, Republic of Seychelles.

Sainte-Anne Marine National Park

Sainte Anne Marine National Park (fig. 7) lies about 5 km from Victoria, the capital city of the Seychelles. It was declared a Marine National Park in 1973 and is one of the largest protected areas/national parks in the Republic of Seychelles (2 km²). It extends over six islands (Cerf, Ile Cachée, Long, Moyenne, Round and Sainte Anne), with the main island of Sainte Anne acting as the centre for administration.

Sainte Anne Marine National Park contains one of the largest areas of seagrass meadows in the granitic islands. Nowadays, the island is occupied by a five-star hotel and access is restricted. The island remains one of the most important nesting sites for hawksbill turtles in the granitic islands, requiring restriction of some beaches during nesting season.

MCSS first began working within the Sainte-Anne Marine National Park in 2015, with the Cerf Island Conservation Program (CICP), which was built in close collaboration with the local community and 3 hotels and guest houses on Cerf Island (within the Ste Anne MPA). Financed through Corporate Social Responsibility (CSR) tax, the two main activities were to 1) provide guest experience enrichment activities (e.g. snorkelling tours); and, 2) help improve the marine biodiversity around Cerf Island. Between 2015 and 2020 activities were conducted using basic equipment and materials (e.g. small scale nurseries, free diving) and we were able to grow 3500 coral fragments and transplant 500 m² of coral reef in the Ste Anne Marine Park. This project was the stepping-stone for MCSS to implement the AF/UNDP regional project, despite the delay in the AF project implementation and suspension of activities with hotels, including their CSR funding due to COVID-19, MCSS struggled, but managed to maintain the small-scale nurseries. Under activity 2.2.3.2 the ocean-based nursery at SAMP will include 8 midwater rope type nurseries, that will be filled with nubbins from asexual propagation.



Figure 7: Location of Ste Anne Marine National Park and Anse Forbans

At Sainte Anne Marine National Park, the initial monitoring of the site was undertaken in October 2020, with coral reef resilience indicators such as hard coral cover, herbivorous fish biomass, structural complexity and coral recruitment. An interactive map is available at: <https://www.mcscoralrestoration.com/draft-map>.



Figure 8: Location of nurseries at Ste Anne Marine National Park



Figure 9: AF project implementation in the Sainte-Anne Marine National Park by MCSS

Anse Forbans

Anse Forbans is the only proposed restoration site which is not situated in an already existing MPA or Fishing Reserve. Given this, it is also the only potential project site that does not have access restrictions in place. The selection of this site was undertaken deliberately, so as to pilot a scheme of community-based reef restoration and management. The tentative siting at Anse Forbans was selected to expand community-based ecosystem restoration activities, reducing their climate change vulnerabilities, and to assess whether coral restoration activities can be successful even outside of protected areas, in situations where strong community engagement is ensured.

The activities at Anse Forbans will be undertaken by MCSS. In association with the Anse Forbans Community Conservation Programme, MCSS has (prior to the implementation of this AF-funded project) undertaken a number of activities ranging from developing hikes and trails into the Collines du Sud hills, wetland mapping and restoration, and small-scale on-land coral propagating. The beach at Anse Forbans is also a prime hawksbill turtle nesting beach and as such is monitored under MCSS Turtle Project. MCSS will build off of previous successful projects, using their knowledge and relationships with local communities/groups in order to successfully implement the activities under this project. No project activities have been undertaken in the Anse Forbans area as of the date of production for this ESIA.



Figure 10: Tentative location for Anse Forbans Reef Restoration sites

Mauritius and Rodrigues:

In Mauritius and Rodrigues, two demonstration sites have been tentatively selected. These are the Blue Bay Marine Park (in Mauritius) and the South East Marine Protected Area (SEMPA) in Rodrigues.

Blue Bay Marine Park

Blue Bay Marine Park (BBMP) was among two of the first marine parks to be declared in Mauritius, and enjoys a high number of visitors with an active management in place (i.e., with coast guards and fisheries officers patrolling the area, a newly-built marine park centre providing a venue for education and research, and a management committee which includes NGOs and other major stakeholders). Blue Bay has also been the site of pilot projects in coral reef restoration in the past.

Blue Bay consists mostly of a tourist village, with beach bungalows used by Mauritians and some rented out to tourists, a public beach which accommodates a large number of Mauritians on the weekends, approximately 100 boat operators registered in the park carrying out glass bottom visits in the park and other outings, and currently two main hotels directly adjacent to the Park as well as a number of smaller guesthouses in the near vicinity.

The Blue Bay Marine Park is a RAMSAR Site, which covers a marine area of 353ha between Pointe Corps de Garde and Pointe Vacoas along the coast (from the lagoon to 1 kilometre seaward from the reef crest). The site provides a habitat for mangroves, algae, sea grasses, 38 species of corals, 72 species of fish and other marine organisms including occasional visits of a few specimens of marine turtles. Blue Bay Marine Park acts as a refuge, feeding, spawning and breeding grounds to various species of marine organisms.

Under output 1.2.3 of this project, Small-scale ocean-based nurseries including table nursery bottom attached model (for culture of up to 100 corals per nursery) and multi-layered rope nursery (for culture of up to 1000 corals per nursery) will be built for community-based coral farming at BBMP. At BBMP 100 table nurseries and 100 multilayered rope nurseries will be established.



Figure 11: Tentative locations of the Blue Bay Marine Park restoration site

South East Marine Protected Area

The South East Marine Protected Area (SEMPA) was established in 2009, and is the largest MPA to date in Mauritius. The MPA operates through a co-management framework between local authorities, fishermen representatives and NGOs. During ecological monitoring carried out between 2009 and 2011, patchy coral bleaching was observed both inside and outside SEMPA, corresponding with higher seawater temperatures at the time. In 2016, the worst coral bleaching event was observed, with an average dead coral cover due to bleaching estimated at 51.40% and a remaining mean live coral cover of only 15.63%. Live coral cover has decreased from >35% in 2010 to 15% in 2016. Strengthening MPA management measures and using an ecosystem-based approach to adaptation is a high priority for Rodrigues. SEMPA is situated in the South East of Rodrigues. It covers an area of approximately 42 km² of marine environment (lagoon and off lagoon). It is very diverse and highly productive ecosystem, but remain relatively shallow, which make the ecosystem vulnerable to climate change.

In the greater SEMPA region, fishing is a core economic activity and households depend heavily on their catch for their own sustenance and consumption. A socio-economic survey carried out in 2008 revealed that within the villages surrounding the SEMPA area, 66% of households responded that at least one household member is involved in fishing activities, with registered fishermen being present in 52% of households. The importance of fishing in the region is further accentuated by local consumption, and a vast majority of respondents of the same survey indicated that they consume seafood on a daily basis. Household use was the most important use of their catch, however 60% of households also sell seafood for income. The most important fishery is the octopus fishery; other common fish caught are 'Cordonnier', 'Capitaine', 'Vielle' and other reef fish.

Fishing is one of the largest employment sectors on the island and is an intricate part of the island's culture, with 13% of the workforce dedicated to this activity, and the same amount engaged in fishing on a casual basis. The villages that are in the immediate vicinity of the proposed restoration site include Graviers, Mourouk, Port Sud Est and Songes, with an estimated population of 2,700. With fisheries in serious decline, fishermen have suffered from a loss of income and many have turned to other sources of income to make ends meet. Rodriguans are much more dependent on their lagoon fishery than in Mauritius, both in terms of employment, cultural practice and protein intake.

Equipment is to be procured under the project to carry out ocean pattern surveys in the South East Marine Protected Area (SEMPA). The final locations of the nurseries should be decided based on the survey results and consultations with the Rodrigues Regional Assembly and relevant local stakeholders.



Figure 12: Indicative Restoration site at SEMPA, Rodrigues

5.2 Site selection planning/considerations for reef restoration

Identification of suitable sites for ecological restoration measures within MPAs is a crucial step towards successful coral reef conservation and sustainable MPA management. In terms of species restoration, it is important to restore the respective species with the best possible environment for growth, survival, fitness, and successful recruitment.

Site selection starts with the definition of appropriate site-selection criteria. It depends on the individual requirements of the target species. For ecological restoration, the ultimate goal is to identify sites where restoration measures are most likely to succeed⁷⁷.

For restoration and reinstallation measures, three general site-selection categories are of relevance:

1. *Ecological history*: evidence for the historical distribution
2. *Feasibility of restoration*: regulating framework and logistics
3. *Environmental conditions*: quality of abiotic and biotic factors

The selection process for the siting of coral reef restoration activities has followed, applied, and assessed each potential site against the above mentioned three categories. By applying these site selection categories (and the subsequent criteria as outlined in Table 4), and through engagement with key stakeholders, the six restoration sites were tentatively chosen.

While the general locations of potential sites for this project have been determined, specific decisions will need to be made by activity partners as to where the actual siting of ocean-based nurseries and restoration sites should be within the respective MPAs. The activity partners should apply the same categories and criteria (fig. 16) that were used in the selection of the MPA's in the first place, as a means to find the most suitable sites within their designated areas. (i.e., ecological history, feasibility of restoration and environmental conditions).

⁷⁷ Pogoda, B, Merk, V, Colsoul, B, et al. Site selection for biogenic reef restoration in offshore environments: The Natura 2000 area Borkum Reef Ground as a case study for native oyster restoration. *Aquatic Conserv: Marine Ecosyst.* 2020; 30: 2163– 2179

Table 4: Relevant site-selection criteria for the ecological restoration of biogenic reefs⁷⁸

Site-selection category	Site selection criteria/indicator
1. Ecological history	1.1 Former presence of target species
	1.2 Colony health state and health
2. Feasibility of restoration	2.1 Marine protected area
	2.2 High-level of community support
	2.3 Regulatory/policy support
	2.4 Absence of bottom-contact fisheries
	2.5 Absence of sand/gravel excavation
	2.6 Absence of submarine cable areas
	2.7 Absence of contraindicated uses
	2.8 Use of sea space by sea users
	2.9 Accessibility to the implementing NGO
3. Environmental conditions (abiotic)	3.1 Temperature
	3.2 Water Quality
	3.3 Current velocity
	3.4 Oxygen concentration
	3.5 Salinity
	3.6 Substrate quality
	3.7 Environmental/climatic hazard potential
	3.8 Depth (considering ~1.9m tidal range)
4. Environmental conditions (biotic)	4.1 Food availability (zooxanthellae concentration)
	4.2 Predation
	4.3 Competition
	4.4 Disease

In addition to the above, all siting for project activities must adhere to both national host country law and UNDP Requirements as specified in the SES. It is important, therefore, that the design of site-specific activities take account of the following exclusions and performance criteria that the project (and its supported sub-activities) must adhere to at all times:

Exclusions:

- activities which may result in significant adverse social impacts to local communities or other project affected parties
- activities which may involve significant displacement and/or resettlement⁷⁹
- activities which may adversely impact the rights, lands, territories and resources of indigenous peoples
- activities which may adversely impact critical habitats
- activities which may result in significant adverse impacts to cultural heritage

⁷⁸ Methodology extracted and revised from Pogoda et. Al. 2020

⁷⁹ Significant displacement and/or resettlement refers here to potential scale. projects involving physical resettlement and/or economic displacement are generally considered High Risk. However, where potential displacement and/or resettlement may be minimal, UNDP may determine that its requirements could be met with application of standard best practice and mitigation measures without the need for a full ESIA.

Performance criteria for site-specific activities:

Ecology

- no clearance of vegetation outside of the designated clearing boundaries;
- no death to native fauna as a result of clearing activities;
- no deleterious impacts on aquatic environments and terrestrial habitats;
- no increase in existing weed proliferation within or outside of any project footprint as a result of construction activities; and
- Increased biodiversity as a result of interventions

Water quality

- no significant decrease in water quality as a result of construction and operational activities
- water quality shall conform to any approval conditions stipulated by UNDP, and/or other government departments, or in the absence of such conditions follow a 'no worsening' methodology; and
- effective implementation of site-specific Environmental and social management and monitoring

Noise and Vibration

The following performance criteria are set for the construction of the land-based nurseries and other pertinent construction works that will be undertaken:

- noise from construction and operational activities must not cause an environmental nuisance at any noise sensitive place;
- undertake measures at all times to assist in minimising the noise associated with construction activities;
- no damage to off-site property caused by vibration from construction and operation activities; and
- corrective action to respond to complaints is to occur within 48 hours.

Social Management and Stakeholder engagement

- the community has been consulted and project elements have been designed with their informed consultation and participation throughout the project;
- all stakeholders are appropriately represented;
- avoid adverse impacts to local community during construction and operations and where not possible, minimise, restore or compensate for these impacts;
- cultural heritage is not adversely impacted;
- community health and safety is protected and overall well-being benefits are derived from the project;
- complaint and grievance mechanisms are put in place and proactively managed; and
- long-term social benefits are achieved.

6.0 Assessment of risks and impacts

6.1 Impact Assessment Methodology

This chapter provides an assessment of potential environmental and social impacts from the proposed Project. In following UNDP requirements, the project underwent an initial Social and Environmental Screening Procedure (SESP) and a number of SES-related risks were identified. For this ESIA, the assessment of impacts has been informed by the project's SESP checklist (Appendix III). The scope of assessment covers all project components, outputs, outcomes and activities. Given the nature of the project, the primary source of direct environmental and social impacts is likely to be from coral nursery (both ocean and land-based) and restoration activities.

Associated mitigation and management measures, for the identified potential impacts, are presented in Section 8 of this ESIA report, with further thematic specific studies and management plans being proposed as environmental and social mitigation/management measures.

An impact is essentially any change to a resource or receptor brought about by the presence of a Project component or by the execution of a Project-related activity.

For this ESIA report, the assessment of impacts will proceed through an iterative process considering three key elements:

1. Prediction of potential impacts and their magnitude (i.e., the consequences of the development on the natural and social environment);
2. Evaluation of the importance (or significance) of potential impacts taking the sensitivity of the environmental resources or human receptors into account; and,
3. Development of mitigation measures to avoid, reduce or manage the potential impacts or enhancement measures to increase positive impacts.

For the purpose of this ESIA, impacts will be defined as follows:

- Nature of impact: positive or negative;
- Type of impact: direct, indirect, or cumulative;
- Duration of impact: temporary, short-term, national, international
- Scale of impact: onsite, local, regional, national, international.

6.2 Assessment of Significance

In adhering to international best practice, this ESIA will establish a 'significance' level for each identified risk/impact. Criteria for assessing the significance of impacts will stem from the following key elements:

- Status of **compliance** with relevant host country legislation (i.e., Republic of Seychelles and/or Republic of Mauritius and Rodrigues), UNDP SES standards/requirements, as well as international best practice standards and guidelines;
- The **magnitude** (including nature, scale and duration) of the change to the natural or socio- economic environment, expressed, wherever practicable, in quantitative terms. The magnitude of all impacts is viewed from the perspective of those affected by considering the likely perceived importance as understood through stakeholder engagement;
- The nature and **sensitivity** of the impact receptor (physical, biological, or human). Where the receptor is physical, the assessment considers the quality, sensitivity to change and importance of the receptor. For a human receptor, the sensitivity of the household, community or wider societal group is considered along with their ability to adapt to and manage the effects of the impact; and
- The **likelihood** (probability) that the identified impact will occur. This is estimated based upon experience or evidence that such an outcome has previously occurred.

It is generally accepted that significance is a function of the magnitude of the impact and the likelihood of the impact occurring.

For this assessment, significance will be defined according to the following levels (as prescribed by UNDP's SES). When probability and consequence of impacts are combined, as shown in Figure 13, it is possible to determine a significance value (low, moderate, or high) for each type of risk.

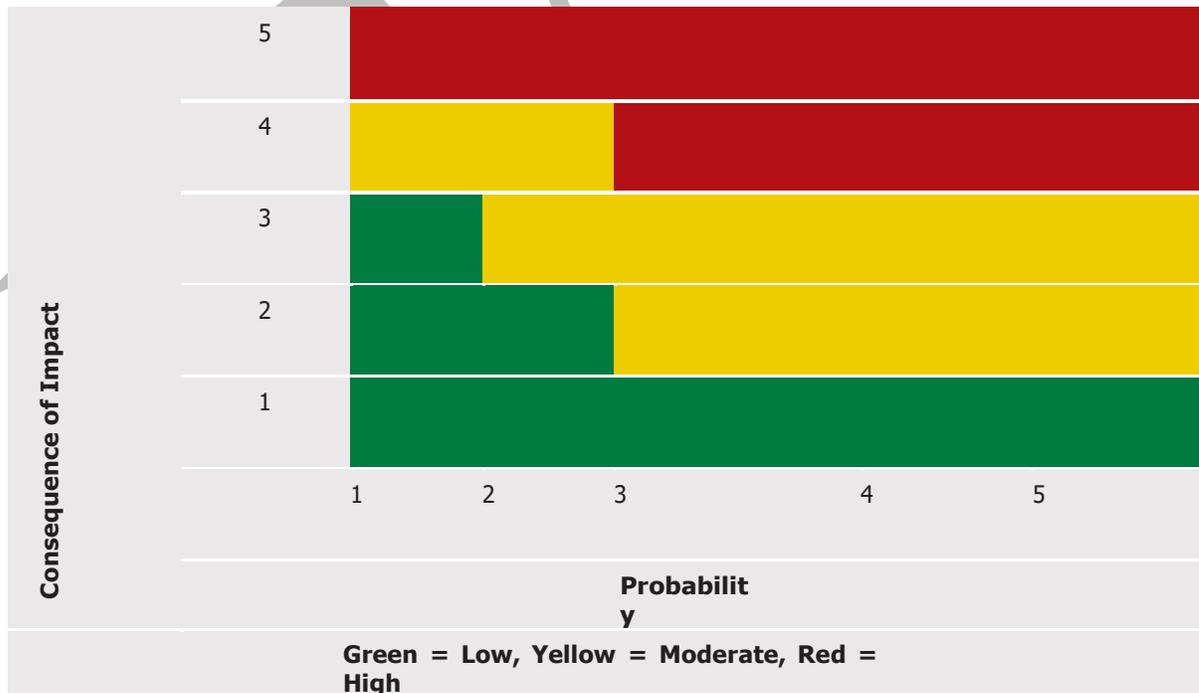
Table 5: Rating of Probability/likelihood of Risk

Score	Rating
5	Expected
4	Highly Likely
3	Moderately likely
2	Not Likely
1	Slight

Table 6: Rating the Consequence/ 'Impact' of Risk

Score	Rating	Definition
5	Critical	Significant adverse impacts on human populations and/or environment. Adverse impacts high in magnitude and/or spatial extent (e.g. large geographic area, large number of people, transboundary impacts, cumulative impacts) and duration (e.g. long-term, permanent and/or irreversible); areas impacted include areas of high value and sensitivity (e.g. valuable ecosystems, critical habitats); adverse impacts to rights, lands, resources and territories of indigenous peoples; involve significant displacement or resettlement; generates significant quantities of greenhouse gas emissions; impacts may give rise to significant social conflict
4	Severe	Adverse impacts on people and/or environment of medium to large magnitude, spatial extent and duration more limited than critical (e.g. predictable, mostly temporary, reversible). The potential risk impacts of projects that may affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples are to be considered at a minimum potentially severe.
3	Moderate	Impacts of low magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures
2	Minor	Very limited impacts in terms of magnitude (e.g. small affected area, very low number of people affected) and duration (short), may be easily avoided, managed, mitigated
1	Negligible	Negligible or no adverse impacts on communities, individuals, and/or environment

Figure 13: Determining the 'Significance' of Risk Matrix



6.3 Assessment of Potential Social Impacts

6.3.1 Restriction of Access to Marine resources and sites

In areas where coral restoration activities are planned and prioritized (via the establishment of ocean-based nurseries and subsequent transplantation), activities that will hamper coral restoration efforts will be restricted. Activities that are likely to be affected include some fishing and tourism activities, both authorized and unauthorized.

In Mauritius, all the project sites are selected within existing MPAs and Fishing Reserves. Since fishing is already prohibited (for both registered and non-registered fishermen) in these protected areas, coral reef restoration works will not cause any newly imposed loss of access to fishing grounds.

There is a higher likelihood for this impact to occur with regards to the proposed site in Anse Forbans, Seychelles. Anse Forbans is the only proposed restoration site which is not situated in an already existing MPA or Fishing Reserve. The selection of this site was undertaken deliberately, so as to expand community-based ecosystem restoration activities, reducing their climate change vulnerabilities, and to assess whether coral restoration activities can be successful even outside of protected areas in situations where strong community engagement is ensured.

The restoration activities in Anse Forbans will be conducted by community members, and as such, community involvement should ensure that stakeholders who would be negatively affected by any project-induced restrictions will be able to benefit from the restoration activities through their own participation in the project. Robust consultation was conducted during the project concept stage with community members in Anse Forbans, who voiced their support for the project (with full knowledge of the potential restrictions that could result from the proposed activities within the site). This initial consultation, and subsequent high-level buy-in by the community, was one of the key considerations behind the siting selection at Anse Forbans (as opposed to other areas that were considered).

Concerning the temporal nature of the potential impact for access restrictions in Anse Forbans, the duration (and exact extent) of restrictions to access of the seascape in question is not currently known. Restrictions could be temporary or more long-term, depending on the context and community decision once the project begins implementation. Any restrictions of access in/near the site of the coral restoration activities should be widely advertised to all project-affected peoples. The area which may be designated for certain types of restrictions is likely to be fairly small, with fishermen and tourism operators being able to access neighbouring seascapes of importance.

The likelihood of this impact has been categorised as '*Highly likely*', with the impact/consequence level being assessed as '*Moderate*'. While the geographic scope/size of area, and the duration of restriction are expected to be limited, the overall significance of the potential impact is considered to be **moderate** for those who may be subject to this restriction.

6.3.2 Economic Displacement associated with voluntary restrictions

As a consequence of potential access restrictions to certain areas of the lagoons at Anse Forbans, some fishermen and tourism operators may experience minor economic displacement/impact on their livelihoods.

If the community at Anse Forbans (i.e., the one project site which is currently not protected/does not have restrictions in place) do decide to put in place certain restrictions on activities/access, fishermen may no longer be able to use certain areas of the seascape, which may in-turn affect their catch and economic activity. Whilst this risk does exist, and adverse economic impacts could fall upon some fishermen, it has been noted through consultations with key project stakeholders that the site in Anse Forbans (which is being considered as the intervention site for this activity) is not an area of high-fishing activity. This was largely attributed to the 'murkiness' of the water and on certain tidal conditions which do not make it particularly conducive to fishing. Any fishermen/community members who do believe that they have had to involuntarily alter their fishing habits, or have suffered adverse economic impacts as a result of the project-induced restrictions, will be able to raise their grievances with the respective activity partners, who must seek to redress any adverse situation. If a mutually agreeable solution cannot be reached, the aggrieved individual will be able to raise a formal complaint via the project's GRM. Any communication of adverse economic impacts of the project should be communicated to the Project Steering Committee.

The likelihood of this impact occurring has been assessed as *'Not likely'*, due to the fact that fishermen will be able to continue fishing in neighbouring areas, and that in the long-term fishing stocks are likely to rise. The temporal nature of this impact is likely short-term, as adverse impacts will most likely be felt in the initial phase of the project (i.e. when the first restrictions are imposed), after which fishing stock numbers will likely increase resulting in an improvement in livelihoods of any potentially affected fishermen. The consequence level of the impact has been assessed as *'Moderate'*, as the impact (if it eventuates) will be limited in terms of geographic and temporal magnitude and can be relatively easily managed and mitigated. As such, the overall significance level for the potential impact of economic displacement has been determined to be **moderate**.

6.3.3 Exclusion of Marginalized and vulnerable groups

If the potential adverse socio-economic impacts do eventuate during the course of the implementation of project activities, they are likely to disproportionately affect vulnerable/marginalized groups within the respective communities.

According to the social register of Mauritius, there are some communities around the target site in Mauritius (e.g. Cite La Chaux near Blue Bay Marine Park,) that have been designated as an area of poverty. These communities are the especially vulnerable to coastal flooding either because they live on the shoreline/reclaimed areas of wetlands at risk of flooding, or because the structures they live in are not robust enough to withstand flooding. This high dependency on tourism can leave certain cohorts of the population especially vulnerable to economic shocks. This is made all the more pertinent by the economic impact of COVID-19 (and associated travel restrictions) which has had a disproportionate adverse economic impact on the tourism industry (and associated sub-sectors) in the WIO region.

Given the high-reliance of vulnerable sectors of the respective communities on resources and access to the seascape (which potentially includes the siting of certain coral restoration sites and ocean-based nurseries), any restrictions placed on permissible activities within/around the sites could have a disproportionate impact on the marginalized and most vulnerable sections of these communities.

While alternative livelihoods, as well as community management and participation in project activities (most specifically through the coral restoration and management activities) is included within the project design, the project may also exclude some vulnerable/marginalized groups (such as fishermen and women), who may not be able to participate in the project implementation directly due to the specialised nature of the skills, educational background and certification that is required for the implementation of coral restoration activities.

Robust livelihood baseline data has not been collected (for a variety of reasons, not the least due to the impact and restrictions that have been in place in both countries due to COVID-19), and as such the number of potentially affected people are not currently known. Baseline livelihood data will be collected through the conduct of a Livelihood Questionnaire Survey. The Livelihood Survey Questionnaire will be included in a separate project-level Livelihood Action Plan. The questionnaire is to be used as a guideline by Responsible Parties and Activity Partners to measure and monitor relevant indicators and evaluate the impact to livelihoods of the project on direct and indirect beneficiaries.

No grievances or concerns have been raised regarding the impact on vulnerable groups during any inception workshops or consultation meetings. This does not mean that such impacts will not occur, and the potential for such adverse impacts to fall upon disadvantaged/vulnerable sections of the community will be monitored throughout the project's implementation.

The likelihood of this impact occurring has been assessed as *'Not likely'*, due to the fact that fishermen (who may themselves be vulnerable or support vulnerable family units) will be able to continue fishing in neighbouring areas, and that in the long-term fishing stocks are likely to rise. The consequence level of the impact has been assessed as *'minor'* as it is considered to be of low magnitude, limited in scale (specific to the sites of coral restoration, most prominently Anse Forbans) and in duration (temporary), and can be managed and/or mitigated with relatively uncomplicated accepted measures. Further, a long-term impact can be considered positive rather than negative. As such, the overall significance level for the potential impact to marginalized/vulnerable groups and individuals has been determined to be **low**.

6.3.4 Gender equity

Adverse impacts relating to gender are most likely to occur with relation to representation within the decision-making structure of the project engagement and inclusion as direct beneficiaries and in unequal representation in capacity building activities. Due to the technical skills, certification and training required to undertake some aspects of the project (i.e., diving, coral restoration etc) certain roles within the project are likely to favour men. As such, the project may inadvertently exacerbate divisions of labour within the communities in the respective countries.

During the project inception phase, the project received a high-level of support from women within coastal communities in Mauritius. In these consultations, women expressed their desire to be involved in the awareness raising campaigns/activities, and to be a part of local-decision making processes.

The project includes some gender mainstreaming elements. A number of indicators included in the Results Framework are designed specifically to capture and support women's empowerment and inclusion within the project. This includes ensuring that:

- at least 30% of young people and women will be direct beneficiaries of the project
- at least 30% of all trainings/workshop and learning event [participants will be female
- at least 35% of representatives in higher level authorities participating in the project will be female

Potential adverse impacts relating to women's empowerment and inclusion within the project are not limited to one given site and/or activity. While the scope of the potential impact may could be considered broad, given the temporary nature of any adverse gender inclusion impacts, and the fact that the project has already built-in certain key gender mainstreaming considerations, the impact/consequence level has been assessed as '*Minor*', while the likelihood of the impact occurrence has been assessed as '*not likely*'. As such, the overall significance of gender equity-related adverse impacts has been determined to be **low**.

6.3.5 Occupational Health and Safety

Potential impacts relating to occupational health and safety for this project could emanate from two distinct sources, i.e., (i) diver safety during the coral restoration activities, and (ii) worker/labourer safety during the construction of land-based nurseries.

Diver safety could be at risk during the coral restoration activities at each of the coral restoration and ocean-based nursery sites (i.e., the Blue Bay Marine Park in Mauritius, the South East Marine Protected Area in Rodrigues, Curieuse Marine National Park, Cousin Special Reserve, Ste Anne Marine National Park and at Anse Forbans in Republic of Seychelles.).

The potential for adverse impacts to diver safety is primarily related to the activities associated with Outcomes 1.2 and 2.2 of the project (i.e. Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals). Some activities will involve scuba-diving in the ocean to transplant the corals as well as monitoring their growth. Trained scuba

divers may be at risk of accidents, as well as injury, relating to the operation and handling of equipment during such activities.

Scuba diving can result in certain health complications. Health and Safety risks relating to diving can include the following;

1. **Drowning:** Drowning typically occurs because of diver panic or because of a diver becoming unconscious due to other, non-diving related health problems. Diver panic can occur because of an out-of-air situation or other emergency. Proper training and the 'buddy system' can go a long way in preventing diver panic and therefore drowning.
2. **Decompression sickness (DCS):** Decompression sickness is a disorder in which nitrogen dissolved in the blood and tissues by high pressure forms bubbles as pressure decreases. Symptoms can include fatigue and pain in muscles and joints. As outside pressure decreases during ascent from a dive or when leaving a compressed air environment, the accumulated nitrogen that cannot be exhaled immediately forms bubbles in the blood and tissues. These bubbles may expand and injure tissue, or they may block blood vessels in many organs—either directly or by triggering small blood clots. This blood vessel blockage causes pain and various other symptoms, for example, sometimes similar to those of a stroke (such as sudden weakness on one side of the body, difficulty speaking, or dizziness), or even flu-like symptoms. Nitrogen bubbles also cause inflammation, causing swelling and pain in muscles, joints, and tendons. In the more severe cases, symptoms may be similar to those of stroke or can include numbness, tingling, arm or leg weakness, unsteadiness, vertigo (spinning), difficulty breathing, and chest pain. Treatment should be undertaken with oxygen and recompression⁸⁰ (high-pressure, or hyperbaric, oxygen) therapy. Limiting the depth and duration of dives and the speed of ascent may also help with prevention.
3. **Arterial Air Embolism (AAE):** An arterial embolism is a blockage of an artery. This can happen to a diver when bubbles form in an artery on ascent and block the blood-flow. Usually, this is the result of pulmonary barotrauma, or damage to the lungs as a result of differences in the ambient pressure and the pressure in the lungs. For example, if a diver holds his or her breath while ascending, the air inside the lungs will expand and can cause serious or even fatal damage to the lungs. Instances of AAE are relatively rare, especially amongst trained divers.
4. **Nitrogen Narcosis:** Nitrogen narcosis is a feeling of drunkenness or giddiness that divers feel at deeper depths, usually around 80-100 feet in saltwater. While not directly damaging, nitrogen narcosis causes temporary reduction in reasoning, decision making, and motor coordination. This can lead to poor decisions by the diver, resulting in DCS or other problems.
5. **Immersion pulmonary oedema (IPO):** IPO is a life-threatening condition that affects surface swimmers, including snorkellers, and divers. The precise incidence is unknown, because fatal cases can be mistaken for drowning. That is because in both IPO and drowning the lungs are waterlogged and heavy and post mortem findings can be similar.

⁸⁰ <https://www.msmanuals.com/en-gb/home/injuries-and-poisoning/diving-and-compressed-air-injuries/recompression-therapy>

In IPO the lung alveoli fill with oedema fluid, which results in dyspnoea, cough and expectoration of frothy or bloodstained sputum. As the condition worsens and hypoxia increases, unconsciousness can occur. Hypoxia can be exacerbated in a scuba diver by ascent because that reduces the partial pressure of oxygen in the lungs and hence arterial blood.

6. **Oxygen toxicity:** Oxygen toxicity occurs in most people when the partial pressure of oxygen reaches 1.4 atmospheres or greater, equivalent to slightly over 187 feet (57 meters) depth when breathing air (shallower depths when breathing oxygen concentrations greater than 20%). Although oxygen toxicity can rarely occur in a hyperbaric oxygen chamber, divers who use inappropriate concentrations of oxygen during deep dives are at higher risk. Symptoms include tingling, focal seizures (such as facial, lip, or one-sided limb twitching), vertigo, nausea and vomiting, and constricted (tunnel) vision. About 10% of people have seizures or fainting, which typically results in drowning⁸¹.
7. **Carbon monoxide poisoning:** Carbon monoxide is a product of combustion. Carbon monoxide can enter a diver's air if the air compressor intake valve is placed too close to engine exhaust or if the lubricating oil in a malfunctioning compressor becomes hot enough to partially combust, producing carbon monoxide. Symptoms include nausea, headache, weakness, clumsiness, and confusion.
8. **Cuts, abrasions, and stings from marine life:** Diver injury can occur through contact with marine life. Coral cuts and abrasions have a lengthy healing time and become infected easily. This is because the living organisms that coat coral structures contaminate the wound, making the injury more severe than a regular graze sustained on land. Divers may also be at risks of stings from jellyfish, coneshells (*Conoidea*), fire corals (*Millepora*), lionfish (*Pterois*), and striped eel catfish (*Plotosus*), as well as cuts from razorshells (*Ensis magnus*), and puncture wounds from Stonefish (*Synanceia*) and sea urchins (*Echinoidea*).

This project will use a mix of professional staff as well as community members and volunteers in certain instances. It is important that divers undertaking underwater works, whether paid or volunteering, are suitably qualified to do so. They should have experience on decompression dives and should have experience and skills on maintaining their decompression stops. Even if it is recommended to avoid decompression dives for certain aspects of the project, underwater physical activities can trigger decompression injury even in instances when all other aspect of the dive were respected. Shallow dives inside lagoons where the depth is less than 10 metres is not an exception to this general rule.

The risk of adverse OHS impacts is not limited to divers; the project will also employ labourers in the construction of the land-based nurseries at Praslin (Seychelles) and at MOI and AFRC (Mauritius). Only two land-based nurseries will be constructed under this project and as such, the required construction at both sites will serve as the main source of potential adverse OHS impacts (both for the workers and potential the surrounding communities).

⁸¹ MSD Manual, UK. <https://www.msmanuals.com/en-gb/home>

Worker health and safety impacts could eventuate from a variety of construction related activities, these include project activities such as working from height, excavation works, rock extraction, working in confined areas, lone workers, traffic, and weak management of work site, which may pose hazards and risk threats to the workers and local community members. The exact siting and scope of construction works for the two land-based nurseries has not been finalized as of the date of this ESIA.

With regard to the land-based nurseries in Mauritius, it has been indicated that they would be located on plots adjacent to the MOI and AFRC buildings respectively. Woodland clearance and fencing will be required. A sea-water pumping system to and from the ocean will also be installed.

Workers (at the construction sites of both land-based nurseries) may also be affected by exposure to construction site hazards such as:

- (i) Handling of construction machinery/equipment
- (ii) Slips, trips and falls
- (iii) Working at heights
- (iv) Hand-arm vibration syndrome⁸²
- (v) Unintended collapse
- (vi) Airborne fibres, toxins and materials
- (vii) Electricity
- (viii) Noise
- (ix) Moving of heavy objects
- (x) Inhalation of particulate emissions (i.e., emissions due to movement of vehicles, exhaust emissions from construction machinery and other equipment such as pile drivers; and emissions from diesel generators required to be run for construction power purposes)

Potential adverse impacts relating to OHS could occur from two aspects of the project's activities, namely; (i) diver safety during coral farming/restoration activities, and (ii) workers health and safety at the construction sites for the land-based nurseries at MOI and AFRC (Mauritius), and Praslin (Seychelles). The likelihood of the impacts occurring has been assessed as '*not likely*' due to the fact that diver safety protocols will be instituted in each of the intervention sites, with requirements, training and certification required for divers who participate in any project activities. Concerning the OHS risks related to the two construction sites (i.e., of land-based nurseries) the risk likelihood has also been classified as '*not likely*' due to the fact that construction risk/hazard assessment and mitigation measures will be developed as part of the project's ESMP. The consequence/impact of potential OHS incidents has been assessed as '*Moderate*'. While the potential impacts are of a low magnitude, limited in scale (site-specific) and duration (temporary), and can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures, the overall significance level of OHS-related impacts has been determined to be **moderate**.

⁸² Hand and vibration syndrome (HAVS) occurs when a worker continually uses handheld power tools. While it is easily preventable, once someone has developed HAVS, the damage is permanent. Early symptoms of HAVS include tingling and/or numbness in fingers and hands.

6.4 Assessment of Potential Environmental and Climate Change Impacts

6.4.1 Activities within Critical Habitats/ environmentally sensitive areas

Five of the six restoration sites are planned to be in marine protected areas. While, the project's interventions are likely to have positive impacts on the biodiversity and the protected areas as a whole, there is a potential that the coral farming/restoration activities could inadvertently impact and disrupt the marine ecosystems in questions. There is a risk that some (small) areas of natural habitat in the project sites may be disturbed in the collection of the donor corals and the construction of ocean-based nurseries.

The project seeks to employ an Ecosystems-based approach to adaptation. This will support the protection of natural habitats and help critical habitats within Marine Protected Areas recover from climate-change related bleaching and other impacts. By engaging with local stakeholders and involving them directly in project implementation, it is expected that management of these protected areas will improve. The project will also utilise a precautionary approach, which should also assist in avoiding potential impacts in critical habitats. Some small areas of natural habitat may be disturbed in the construction of nursery sites, due to mishandling of material or equipment. Science-based coral reef restoration work, proposed by this project, will avoid the risk of damaging natural habitats when installing ocean nurseries in restoration sites as much as possible.

Another source of potentially adverse impacts to environmentally sensitive areas will be the civil works undertaken during the construction of the three planned land-based nurseries (i.e., at Praslin, MOI, and AFRC). The construction at each of these sites has the potential to affect surrounding natural habitats. Impacts to the surrounding habitat from the construction activities could include:

- Construction debris will have the potential for spread to areas outside the site boundary during construction. Improper disposal of construction debris can lead to contamination of water bodies in the proximity of the Project area. Improper disposal of solid waste at site and lack of proper sanitation facility for labour can lead to unhygienic conditions and spread of diseases in the area.
- Emissions due to movement of vehicles, exhaust emissions from construction machinery and other equipment such as pile drivers; and emissions from diesel generators required to be run for construction power purposes.
- Improper storage of soil and construction material can also increase dust emission from the site.
- Increases in excessive noise levels.
- Improper disposal of sewage and wastewater from construction debris can contaminate the ground water resources at the site and in the surrounding area.
- Improper disposal of packaging materials, boxes, plastics and ropes can lead to littering in the construction site and surrounding areas. Hazardous wastes such as waste oil, lubricants, hydraulic oil etc. can cause contamination of soil and water bodies if adequate precautions for management and handling are not undertaken. Use of chemicals such as paints, curing chemicals, etc. can lead to contamination of soil.

Potential adverse impacts relating to critical natural habitats and environmentally sensitive areas could occur via two main source-points; (i) coral restoration/farming activities within MPAs and

(ii) construction activities for the three land-based nurseries. The likelihood of the impacts occurring has been assessed as 'expected' due to the geographic location of siting for activities. The consequence/impact level of this risk has been determined to be 'minor', due in part to the nature of activities that will be undertaken in critical habitats/environmentally sensitive areas, as well as the fact that the project will seek to avoid the risk of impacting natural habitats (when installing ocean nurseries and intervention in restoration sites) as much as possible, and will undertake a detailed science-based evaluation of nursery and restoration sites, which is included in the proposed activities, in order to assist with minimizing such risks. The project will not involve unjustified conversion or degradation of critical natural habitats, including those that are: (a) legally protected; (b) officially proposed for protection; (c) recognized by authoritative sources for their high conservation value, including as critical habitat. As such the overall significance of this potential impact has been classified as **Moderate**. Potential impacts to critical habitats can be easily avoided, managed and mitigated.

6.4.2 Use of genetic resources and impacts on biodiversity/biological diversity

The project's intervention sites are located within areas of high biodiversity. The project aims to restore two reef sites in the Marine Protected Areas in Mauritius (Blue Bay Marine Park and South East Marine Protected Area) and three sites in the MPAs of Seychelles (Cousin Island, Curieuse Island and Ste Anne) and one non MPA site in Seychelles (Anse Forbans), all of which represent areas of high biodiversity value.

Through the project's activities which are aimed at restoring coral colonies (i.e., the project's target for farmed corals in both countries is 140,000 corals in Mauritius and 103,500 in Seychelles.), there is a potential to adversely impact the genetic diversity in the marine ecosystems where the project will be implemented. Depending on species, colony size, colony type, colony state and health, coral nubbins will be taken from the wild for culture in nurseries. Based on studies undertaken by the MOI, 10% nubbins taken from a *Pocillopora verrucosa* colony of approximate size diameter 25cm may amount to a total of 10-12 fragments. However, 10% nubbins taken from a *P.eydouxi* colony of approximate size diameter 35cm may amount to a total of 5-8 fragments. For *Acropora selago*, 10% nubbins taken from a colony of approximate size diameter 40cm may amount to a total of 18-20 fragments. On the other hand, for *A.muricata*, which usually covers whole patches of reefs (but with patches comprising several colonies, which are usually hard to demarcate), 10% nubbins taken from a patch of approximate size diameter 2000cm may amount to a total of 200-220 fragments. Based on these findings, it is estimated that 140,000 fragments will be acquired from a total area of 7.7ha of healthy reef.

Through a focus on a small selection of climate resilient species for restoration, it is possible that genetic diversity amongst the coral populations is adversely affected. The project aims to undertake asexual reproduction (fragmenting) of climate resilient species to stabilize and stop the degradation of the restoration sites. Previous work for similar coral restoration interventions indicates that once a site has been restored with nursery grown corals using asexual reproduction, the newly transplanted corals perform normal sexual reproduction and the restored sites recruit new juveniles of the coral species used in the restoration action but also coral species coming from elsewhere though larval drift in ocean currents. Therefore, the larval attraction effect generated by the restored site ensures the increase of biodiversity over time.

The likelihood of impacts concerning the genetic resources and biodiversity in the marine ecosystems is considered '*expected*' due to the nature of the project activities (i.e., the use of coral species). The consequence/impact level of potential adverse biodiversity related impacts has been assessed to be negligible, as the selection of corals will be done carefully based on the best scientific knowledge available to date for their climate resilience and for their suitability to be planted where the coral restoration activities are expected. The overall significance of potential adverse impacts to biodiversity through the production of aquatic species (i.e., corals) has been classified as **low**.

6.4.3 Climate change vulnerability and maladaptation

It is widely believed that climate change will increase the temperature of the sea (within the project sites) in the future and thus potentially lead to more coral bleaching and death in the long term when no action is taken. The project cannot avoid the potential impacts of climate change and the project outcomes are vulnerable to them. However, the project interventions are intended to reduce the adverse impacts of climate change felt by the vulnerable communities in the two countries by making the coral populations more resilient to climate change. While the objectives of the project are to provide for a more climate resilient ecosystem in the region, the project may not be immune to potential climate change risks and impacts. The outcomes of the Project are sensitive and/or vulnerable to potential impacts of climate change. Rising sea temperatures may result in increased coral bleaching.

Between March and May 2019, a coral bleaching event occurred in Seychelles. Surface sea temperatures crept up to 31°C and caused widespread damage to reefs in the area. This event was caused by tropical Cyclone Idai, which delayed rains from moving northward, and prolonged hot, summer conditions in Seychelles. This meant greater stress for corals. This is the third significant coral bleaching event to take place in Seychelles' coral reefs. Seychelles lost up to 90 percent of its coral reefs in 1998, during the biggest El Niño weather event ever recorded in the western Indian Ocean. For a relatively short period of a few months, seawater temperatures rose by 2°-3°C. This slight increase caused a major coral bleaching event. Another bleaching event occurred in 2016 and hit the partially-recovered reefs. . It caused a devastating 50 percent decrease in live hard coral cover, according to the Seychelles National Parks Authority (SNPA)^{83,84}. The % reduction in coral cover was not even across the EEZ with the inner islands hit much harder than those beyond the Seychelles plateau. Hydrometeorological disaster could also impact the project and ocean-based nurseries through storm surges etc.

The project is designed to enhance Mauritius and Seychelles resilience to climate change to reduce the adverse impacts of climate change felt by the most vulnerable. Demonstrations on the ground will show how integrated natural resources management can be a key tool in addressing climate change.

The project will also have positive impacts (i.e., economic benefits) in terms of savings on coastal infrastructural solutions for climate change adaptation. Reef building corals form solid calcium

⁸³ <https://www.snpa.gov.sc/about-us/news/187-seychelles-worst-hit-by-the-2016-bleaching-event>

⁸⁴ <https://www.snpa.gov.sc/about-us/news/187-seychelles-worst-hit-by-the-2016-bleaching-event>

carbonate skeletons, which act as an effective method of dissipating destructive wave energy. Currently, 12.2 km² of built-up land, 11.8 km² of expansion areas, 60 km of primary and 80 secondary roads are at risk of coastal inundation⁸⁵. It is estimated that up to 36 hotels are considered to face inundation risk, 6 at landslide risk and 8 at flood risk, while 17 percent of beaches representing 13% of the coastline are suffering from long-term erosion⁸⁶. Pointe d'Esny, a locality located close to Blue Bay Marine Park earmarked as a rehabilitation site, has been designated as vulnerable for coastal erosion at a rate of over 0.2 meters per year⁸⁷. Rates of sea level rise around Mahe in Seychelles have been measured at 1.46 mm a year⁸⁸. 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 Ocean⁸⁹. 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.

The likelihood of potential adverse climate change impacts affecting the project has been assessed as *'Not likely'*, due in part to the fact that the project will be selecting species of coral (i.e. for restoration activities) that have been chosen based on their climate resilience. The consequence level of the potential impact has been assessed as *'severe'*, as any extreme climate change induced event that could cause adverse impacts to the project would likely be wide spread (in terms of scope) and be of a large magnitude. The overall significance of the risk has thus been classified as **moderate**.

6.4.4 Increase uptake in poaching

Through effective coral restoration activities, this project is expected to result in an increase of biodiversity within restricted areas (i.e. MPAs). As a consequence, there is the potential that there could be increases in poaching/illegal take incidents. This is not only limited to the restored coral species (which may be at risk) but other associated species within the ecosystem, that may also see an increase in numbers as an indirect positive impact of this project's interventions.

This risk could be further exacerbated by the COVID-19 situation, through two main conduits. Firstly, COVID-19 restrictions may make it more difficult for implementing partners/activity partners to access and monitor restoration sites. As such, surveillance and enforcement of restrictions on poaching may be more difficult to enforce. Secondly, the COVID-19 crises will

⁸⁵ Japan International Cooperation Agency Kokusai Kogyo Co. Ltd., "Guideline for Climate Change Adaptation Strategy - Coastal Setback" (2016) The Republic of Mauritius Ministry of Environment, Sustainable Development, And Disaster and Beach Management

⁸⁶ Republic of Mauritius (2016). Third National Communication: Report to the United Nations Framework Convention on Climate Change. Republic of Mauritius, Port Louis.

⁸⁷ The Project for Capacity Development on Coastal Protection and Rehabilitation in the Republic of Mauritius by JICA (Japan International Cooperation Agency), 2015

⁸⁸ Chang-Seng, D. 2007. Climate Change Scenario Assessment for the Seychelles, Second National Communication (SNC) under the United Nations Framework Convention on Climate Change (UNFCCC), National Climate Change Committee, Seychelles.

⁸⁹ Nicholls, R.J. & Hoozemans, F.M.J. 2002. *Global Vulnerability Analysis*. In Schwartz, M. (Ed). Encyclopedia of Coastal Science, Kluwer Academic Publishers.

impact the socio-economic situation of many vulnerable communities within the region. As such, many individuals (who were previously employed either directly or indirectly in the tourism sector, which has been badly hit), may see illegal poaching and fishing as a way to sustain their livelihoods. Macroeconomic shocks, such as the downturn in tourism caused by COVID-19 induced travel restrictions, are likely to be felt by the most vulnerable within local societies.

The likelihood of the potential impact concerning an increase in poaching instances, has been assessed as '*moderately likely*'. The impact consequence level has been assessed as '*moderate*'. The overall significance level for this potential impact is considered to be **moderate**.

Analysis of Alternatives

6.5 No project alternative

This section of the ESIA explores alternatives to the project design, siting and activities. This includes presenting and assessing the "no project" alternative. Several issues would occur if the "no project" alternative was followed;

- 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.
- As coral reefs decline, fewer tourists will come for the purpose of diving and snorkelling.
- 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.

With the "no project" option, the opportunity would be lost for environmental and social improvement concerning the state of coral reefs within the region and of the livelihoods of local communities.

6.6 Potential alternative siting for restoration activities in Anse Forbans

From the six project demonstration sites that have been tentatively selected for the implementation of this project, only one does not have pre-existing restrictions on access and activities, which is particularly pertinent for fishermen. The only potential site not currently within an MPA is Anse Forbans.

As there are currently no restrictions in place within the area of Anse Forbans, any newly imposed restrictions may result in potential adverse economic impacts for fishermen and tourism operators who rely on these waters and their resources for a source of income and livelihood.

While risks of economic displacement and access restrictions do exist, the selection of Anse Forbans as a demonstration site for this project was deliberately chosen to serve as a pilot case for community managed coral reef restoration activities outside of protected areas. The objective of the pilot at Anse Forbans is to trial an approach of reef restoration for the community, by the community. If this approach proves to be successful, it is hoped that this could be replicated and scaled up both regionally and internationally.

The alternative to the siting in Anse Forbans would be to include these activities in an area within a pre-existing MPA (such as is being done for the other five demonstration sites). However, the potential benefits that could be derived from successful implementation of the community management pilot in Anse Forbans outweigh the potential impacts that may be associated with the activities. The significance level of access restriction and economic displacement related impacts has been assessed as moderate (see Section 6.3.1 and 6.3.2 respectively), with any impacts being relatively easily managed and mitigated.

7.0 Mitigation and Management Measures

This section presents key mitigation and management measures that the project will undertake in relation to the risks and impacts that were identified and assessed as part of Section 6 of this ESIA. The mitigation and management measures presented here represents a summary of actions that are prescribed and further elaborated in the project's ESMP (Appendix I).

The project follows best practice and the requirements of UNP's SES through the application of the mitigation hierarchy. The measure identified in the ESMP and summarised here seek to avoid, and if avoidance is not possible, reduce potentially significant adverse social and environmental impacts to acceptable levels.



Figure 14: Mitigation Hierarchy

Mitigation measures are developed to avoid, reduce, remedy or compensate for significant potential negative impacts, and to create or enhance potential positive impacts, such as environmental and social benefits. In this context, the term "mitigation measures" includes

operational controls as well as management actions. These measures are often established through industry standards and may include:

- Changes to the design of the project during the design process (e.g., changing the development approach);
- Engineering controls and other physical measures applied
- Operational plans and procedures (e.g. diver safety protocol, OHS construction risk matrix, etc); and
- The provision of like-for-like replacement, restoration or compensation.

For potential impacts that are assessed to be of **major** significance, a change in design is sometimes required to avoid or reduce the significance.

Through the assessment of environmental and social impacts, a selection of potentially adverse impacts has been identified. These are as follows:

- Restrictions of access to marine resources and sites (6.3.1)
- Economic displacement associated with newly imposed voluntary access restrictions (6.3.2)
- Exclusion of vulnerable and marginalized groups (6.3.3)
- Gender Equity (6.3.4)
- Diver safety (6.3.5)
- OHS in construction of land-based nurseries and facilities (6.3.5)
- Impacts on critical habitats and environmentally sensitive areas (6.4.1)
- Impacts on biodiversity (6.4.2)
- Climate change vulnerability and maladaptation (6.4.3)
- Increase in poaching levels (6.4.4)

The mitigation measures, as they correspond to the potential adverse impacts are as follows:

7.1 Restrictions of Access to Marine Resources and Sites

In areas where coral restoration activities are planned and prioritized, activities that will hamper coral restoration efforts will be restricted. Activities that are likely to be affected include some fishing and tourism activities, both authorized and unauthorized. This will most directly affect the project site at Anse Forbans, which is the only tentatively selected demonstration site not currently under the protection of an MPA. As such, fishermen may have to change their fishing practices (either concerning the areas they fish, or the route they get to their fishing ground, etc.) in order to ensure the effectiveness of the coral restoration activities. However, those changes in their fishing practices will not be involuntary. Rather, they will be willingly and voluntarily implemented by the communities to ensure the effectiveness of coral restoration activities.

Continued stakeholder engagement and participation will be a crucial management measure to ensure that individuals and communities are able to provide their feedback and opinions on any voluntarily imposed restrictions at the Anse Forbans site. There will be sufficient sensitization and training activities supported by the project to ensure that the communities understand and appreciate the various linkages between their activities and their impacts on marine ecosystems, as well as the linkages between the healthy marine ecosystems (including restored corals and

fisheries) and ecosystem goods and services that they provide to the communities in the long term.

The project team will also raise awareness on accessible channels for grievance redress, so that any community members who feel that they have been adversely impacted via the project activities (either directly or indirectly) may launch a formal complaint and seek redress.

7.2 Economic Displacement Associated with Voluntary Access Restrictions

As a consequence of potential access restrictions to certain areas of the lagoons at Anse Forbans, some fishermen and tourism operators may experience minor economic displacement/impact on their livelihoods.

All the community members neighbouring the project sites (including the vulnerable and marginalised groups) will be informed of the grievance mechanism put in place by the proposed project. In an extreme case that a grievance received cannot be resolved without a change in the project location, then the project will consider selecting another coral restoration site within another protected area, where no fishing activities are allowed, to ensure that the project will cause no impacts on existing fishing activities.

The project will seek full community engagement in the restoration activities, with a strong sustained communication effort throughout the project implementation phase to ensure the buy-in and cooperation of the fishermen. Fishermen who previously have used the areas selected as restoration sites, will also be encouraged and authorized to use the neighbouring fishing areas during the project implementation. Where possible, the project will seek to assist potentially affected fishermen through alternative livelihood activities.

To address, manage, and mitigate any potential adverse economic impacts to local communities, a project-level Livelihood Action Plan (LAP) will be developed. The LAP will include a Livelihood Survey Questionnaire. The questionnaire is to be used as a guideline by Responsible Parties and Activity Partners to measure and monitor relevant indicators and evaluate the impact to livelihoods of the project on direct and indirect beneficiaries.

7.3 Vulnerable and Marginalized Groups

If potential adverse socio-economic impacts (as identified in sections 6.3.1 and 6.3.2) do eventuate during the course of the implementation of project activities, they are likely to disproportionately affect vulnerable/marginalized groups within the respective communities. Vulnerable and marginalized groups may also not be able to access benefits from the project at the same level as other sections of the population.

To manage and mitigate such potential impacts, the project will ensure the participation of women and other marginalised and vulnerable groups in the implementation of the project and in the planned sensitization campaigns. The Project Results Framework also includes specific indicators for the inclusion of marginalized and vulnerable groups. Inclusion of vulnerability criteria, and

assessing/disaggregating the results of any potential adverse livelihood impacts will also be included within the framework of the LAP and its associated survey.

7.4 Gender Equity

Adverse impacts relating to gender are most likely to occur in relation to representation within the decision-making structure of the project, engagement and inclusion as direct beneficiaries, and in unequal representation in capacity building activities. Due to the technical skills, certification and training required to undertake some aspects of the project (i.e., diving, coral restoration etc) certain roles within the project are likely to favour men. As such, the project may inadvertently exacerbate divisions of labour within the communities.

During the conceptualisation stage of the project, stakeholder engagement included specific engagement with women and women's organisations. In these consultations, women expressed their desire to be involved in the awareness raising campaigns/activities, and to be a part of local-decision making process.

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.

A number of indicators included in the Results Framework are designed specifically to capture and support women's empowerment and inclusion within the project. This includes ensuring that:

- at least 30% of young people and women will be direct beneficiaries of the project;
- at least 30% of all trainings/workshop and learning event [participants will be female; and,
- at least 35% of representatives in higher level authorities participating in the project will be female

7.5 Diver Safety

Diver safety could be at risk during the coral restoration activities at each of the coral restoration/farming sites (i.e., The Blue Bay Marine Park in Mauritius, the South East Marine Protected Area in Rodrigues, Curieuse Marine National Park, Cousin Special Reserve, Ste Anne Marine National Park and at Anse Forbans in Republic of Seychelles.). The potential for adverse impacts to diver safety is primarily related to the activities associated with Outcomes 1.2 and 2.2 (i.e., Coral farming and nursery facilities established at a sufficient scale for more climate change resilient corals). Some activities (under outcomes 1.2 and 2.2) will involve scuba-diving to plant the corals and monitor their growth. Trained scuba divers may be at risk of accidents, as well as injury, relating to the operation and handling of equipment during such activities.

To manage and mitigate potential EHS risks relating to diver safety, each responsible party/activity partner will be required to follow a standardised set of diver safety protocols. All project staff working in the lagoon on coral restoration and having to work underwater will have to be qualified divers and also trained in providing first aid in the event of any mishap. OHS-Diver Safety Management plan will be developed. This will include a checklist to be followed by the

Responsible Parties and Activity Partners so as to ensure that proper measures are in place for the community groups and individuals selected to conduct coral restoration and monitoring activities, in line with the Labour and Occupational Health and Safety laws in each country.

During project implementation, the PMT and National Project Teams will ensure compliance with national and international labour laws and occupational and health safety laws. Adequate protection equipment for workers, training (advanced training for diving activities), insurance and access to medical decompression chamber will be provided to all divers/workers (including both professional staff and any volunteers who are employed as well). A more detailed list of diver safety protocols to be followed is included in **an Appendix XX (under development)**.

7.6 OHS Safety on Construction Sites

Only three land-based nurseries will be constructed under this project and as such, the required construction at the relevant sites will serve as the main source of potential adverse OHS impacts (both for the workers and the surrounding communities). Currently the exact location and scope of the land-based nurseries is not known. Once project proponents finalize the location siting and construction plans/designs, these must be submitted to UNDP CO to review, assess compliance, and approve, before commencement of construction activities/civil works can be undertaken.

To avoid, manage and mitigate any potential adverse impact that may be encountered during the construction works associated with the planned land-based nurseries at MOI and AFRC in Mauritius and Praslin (in Seychelles), a construction risk matrix and associated management plan has been developed (under development).

All provisions of the Occupational Safety and Health Decree 1978 (Seychelles) must be complied with in the implementation of this project. Mitigating measures outlined in the Appendix I, ESMP include: PMT and National Project Teams ensuring compliance with the relevant health and safety laws; provision of adequate protection equipment, training, and insurance.

Section 5 of the Occupational Safety and Health Act 2005 (Mauritius and Rodrigues) provides that every employer shall ensure the safety, health and welfare at work of their employees. In particular, an employer is required to:

- (i) provide and maintain a working environment and any plant or systems of work under their control;
- (ii) ensure that use and storage of articles and substances is safe and without health risks;
- (iii) provide instruction, training and supervision as is necessary to ensure the safety of employees at work; and,
- (iv) ensure that any person not in their employment is not exposed to any health risk by nature of the work undertaken⁹⁰.

⁹⁰ Occupational Safety and Health Act 2005 (No. 28 of 2005), s 5

7.7 Impacts on Critical Habitats and/or Environmentally Sensitive Habitats

Five of the six restoration sites are planned to be in marine protected areas. While the project's interventions are likely to have positive impacts on the biodiversity and the protected areas as a whole, there is a potential that the coral farming/restoration activities could inadvertently impact and disrupt the marine ecosystems in question if not done in a cautionary and non-invasive manner. There is a risk that some (small) areas of natural habitat in the project sites may be disturbed in the collection of the donor corals and the construction of ocean-based nurseries.

Science-based coral reef restoration work will avoid the risk of impacting natural habitats when installing ocean-based nurseries and undertaking other associated activities in the restoration sites as much as possible. All precautions will be taken to ensure that the natural habitat remains undisturbed, as far as possible. The science-based coral reef restoration will not harm the donor colonies where the coral nubbins are extracted. This approach was tested in the previous efforts of coral restoration in Seychelles. Lessons learnt from previous coral reef restoration efforts in the region indicate that as long as the maximum amount of nubbins to be extracted from a donor coral is limited to 10 % per colony volume, damage to donor colonies can be avoided.

Training will be provided to responsible parties, workers and community members that will be directly involved in the project to ensure the protection of natural habitat. Moreover, in the event that there is need to displace some living species, this would only be undertaken as a last resort, after all other options have been explored. Any relocation of species will be done in the presence of the respective authority (e.g. Fisheries officers of the MOEMRFS in Mauritius), and is not generally foreseen based on previous experience of similar projects in the region. The project will also include continuous monitoring of the water quality, biodiversity and other key environmental parameters of the donor and nursery sites. A detailed science-based evaluation of nursery and restoration sites, which is included in the proposed activities, will also help to minimize such risks.

7.8 Impacts on Biodiversity and Biological Diversity

Coral reef restoration work will be carried out with two identified species (*Pocillopra* spp. & *Acropora* spp) . It is possible that the focus on climate-resilient species will lead to a reduction of genetic diversity in the restored sites. It is likely that in the short term, there will be a decrease in genetic diversity. In the short term, asexual reproduction (fragmenting) of climate resilient species will be implemented to stabilize and stop the degradation of the restoration sites. Thereafter, the genetic diversity would be increased through sexual reproduction of the transplanted corals.

Robust monitoring of coral reef resilience indicators such as hard coral cover, herbivorous fish biomass, structural complexity and coral recruitment⁹¹ will also be undertaken during project implementation to adequately measure and monitor any impacts to biodiversity within the coral reef ecosystems.

⁹¹ Informed by Maynard, J., Marshall, P., Parker, B., Mcleod, E., Ahmadia, G., van Hooiconk, R., ... & Tamelander, J. (2017). *A Guide to Assessing Coral Reef Resilience for Decision Support*.

7.9 Climate Change Vulnerability and Maladaptation

While the objectives of the project are to provide for a more climate resilient ecosystem in the region, the project may not be immune to potential climate change risks and impacts. The outcomes of the Project are sensitive and/or vulnerable to potential impacts of climate change. Rising sea temperatures may result in increased coral bleaching. Hydrometeorological disaster could also impact the project and ocean-based nurseries through storm surges etc.

In order to mitigate this risk, coral species chosen for restoration will be selected based upon their potential climate resilience, factoring in lessons learned from previous similar interventions in the region. The project is designed to enhance Mauritius and Seychelles resilience to climate change. Demonstrations on the ground will show how integrated natural resources management can be a key tool in addressing climate change.

7.10 Uptake in poaching-levels

Through effective coral restoration activities, this project is expected to result in an increase of biodiversity within restricted areas (i.e. MPAs). As a consequence, there is the potential that there could be increases in poaching/illegal take incidents. This is not only limited to the restored coral species (which may be at risk) but other associated species within the ecosystem, that may also see an increase in numbers as an indirect positive impact of this project's interventions.

The regulatory framework (see Section 2 of this ESIA report) provides for the control of the coral nurseries in both countries. The relevant authorities will provide enhanced enforcement measures so as to ensure that private sector involvement in coral reef restoration follows required standards and chain of custody for corals grown in nurseries. It is to be noted that MOEMRFS and MACCE are the Ministries responsible to enforce the protection of MPAs and marine ecosystems in Mauritius and Seychelles, respectively. They are the Executing Entities for this project. In the event poaching has been observed, the responsible Ministry will take all necessary legal actions against the offenders. During project consultation and sensitization, key references and capacity building support will be provided on the topic of regulatory compliance for fishing and use of other marine resources.

8.0 Stakeholders

A detailed set of consultations with key project stakeholders has been facilitated by the UNDP project team/country office. The consultations were conducted in collaboration with the Regional Project Manager. A brief indicative agenda was developed for the consultations, which is as follows:

- 1. Introduction to the Purpose of the Meeting** (UNDP: Rachna Ramsurn and Satyajeet Ramchurn) (5 minutes)
- 2. Brief Overview of the Status of the Project** (UNDP: Rachna Ramsurn and Satyajeet Ramchurn) (15 minutes)
 - current state of the project in Seychelles
 - current state of the project in Mauritius and Rodrigues
- 3. Environmental and Social Safeguard Requirements** (International safeguards consultant: David Annandale)
 - with respect to environmental and social risks ... what are the stakeholders concerns? (10 minutes)
 - brief outline of the UNDP requirements, as per the Social and Environmental Standards (15 minutes):
 - * the Social and Environmental Screening Procedure
 - * the Environmental and Social Impact Assessment and Environmental and Social Management Plan
 - * Livelihoods Action Plans
 - * Monitoring Plans
 - * Site Selection Plans
 - * Security/OHS plans
 - Construction work Plans
 - * Training
 - scheduling of the safeguards work
- 4. Feedback: Comments and Concerns** (facilitated by David Annandale) (15 minutes)

In total, eight meetings were planned with key project stakeholders between the dates of June 7th- June 22nd 2021. A detailed list of the schedule of consultations undertaken is included in this ESIA as Appendix V. Minutes of each of these meetings are presented in Appendix II of this ESIA.

Prior to the June key stakeholder consultations, robust consultation was undertaken with local communities and individuals during the project design/concept phase. 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 consultations workshops have been held to present the project and to prepare an action plan for stakeholder engagement in the project.

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.

In Seychelles, the MACCE 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 MACCE for the implementation of project activities. A business plan will be prepared and the activity partners 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.

Due to the COVID-19 pandemic, and with on-going related travel restrictions in place, consultation and large-scale workshops have faced certain difficulties. On-going consultation and engagement of local communities has occurred at varying levels of maturity across the different demonstration sites.

8.1 Site-specific consultation: SAMP

One site, in which consultations have been able to be thoroughly undertaken was at the Sainte Anne Marine Park (SAMP) (through MCCS). In an effort to engage the local community, inform stakeholders on the ongoing activity implementation and capture relevant concerns for the project, stakeholder and community consultation commenced on 28 February 2021.

A brief overview of the consultation process thus far at SAMP is presented below (with a list of identified stakeholders included as Appendix IV).

Objectives

The objectives of this Stakeholder and Community Consultation are to:

- Disseminate information to stakeholders and local communities to raise awareness on the project.
- Increase stakeholder engagement on the project, including its objectives, opportunities and constraints.
- Collate feedback from interested and affected parties to inform activity development and ensure that outcomes appropriately meet the relevant needs of those concerned.

Method

The relevant stakeholders have been reached using the following processes:

- Identification of key stakeholders using the SAMNP and community living in its boundaries
- Preparation and dissemination of methods of engagement in the context of COVID-19 pandemic
- Awareness raising through distributed and online media/presentations/posters
- Compilation and analysis of stakeholder and community responses

Table 7 summarises the methods and tools used in this stakeholder and community consultation.

Results

A total of 103 unique stakeholders of the SAMNP have been identified. Appendix 1 presents the list of different stakeholders grouped by categories identified during the process of consultation.

Table 7: List of indicators and results per tools used to engage stakeholders and the local community.

Tool	Purpose	Format	Indicators/Results
Media Releases	Released at key milestones: the opening of consultation periods and on outcomes	Newspaper	1 Article in Nation; 1 article in Today, 1 Article in Seychelles News Agency
Social Media	Raise awareness and direct traffic to online information and survey	MailChimp, Instagram, CODE	Facebook, WhatsApp, QR
Website	Dedicated landing pages including vulgarized information in both English and Creole	www.mcsscoralrestoration.com	Referencing in SEO google and google map 118 unique visitors from 28 February to 20 April 2021
Print Advertising	Keep community informed through traditional print channels	Posters placed at Marine Charter Association, AngelFish Eden Island, etc.	6 poster deployed
Online Surveys	Collate stakeholder and community responses and feedback on project implementation and activities development	Google forms	1 questionnaire; 29 responses on 20 April 2021

Online Survey

The online questionnaire was made available online from 8 March until 15 April 2021 and was promoted through newspaper articles, social media and print advertising using a QR code. A total of 29 individuals responded to the questionnaire.

Table 8: Number of responses to the online questionnaire per stakeholder category

Categories	#
Academia	5
Civil Society	5
Government/Authority	6
Parastatal	1
Resident	3
Tourism - boat excursion	4
Tourism - dive operator	1
Tourism - hotel	2
Tourism - Tour operator	2
Grand Total	29

Discussion and recommendations

The project disseminated information to a broad range of stakeholders, who were considered representative of the users of the Marine Park. The results from the questionnaire show a positive response from stakeholders to the project; for example, **96.6% of respondents think the coral restoration project will have a positive impact on their activities.** Moreover, 100% of respondents would like to receive more information about the project in the future.

In terms of recommendations from the stakeholders, the following was obtained:

"In view of the length of the project it would be good to ensure it is integrated accordingly in the Ste Anne Management plan"

Integration of the project in the management plan of the Ste Anne Marine National Park is ongoing through the national consultation process. Formalisation of the partnership with the Seychelles National Parks Authority remains a priority and will be achieved through the signing of a Memorandum of Understanding.

"Can the SNPA install anchor blocks to tie on at various points in the marine park - this will prevent boat owners to anchor - this will protect the reefs."

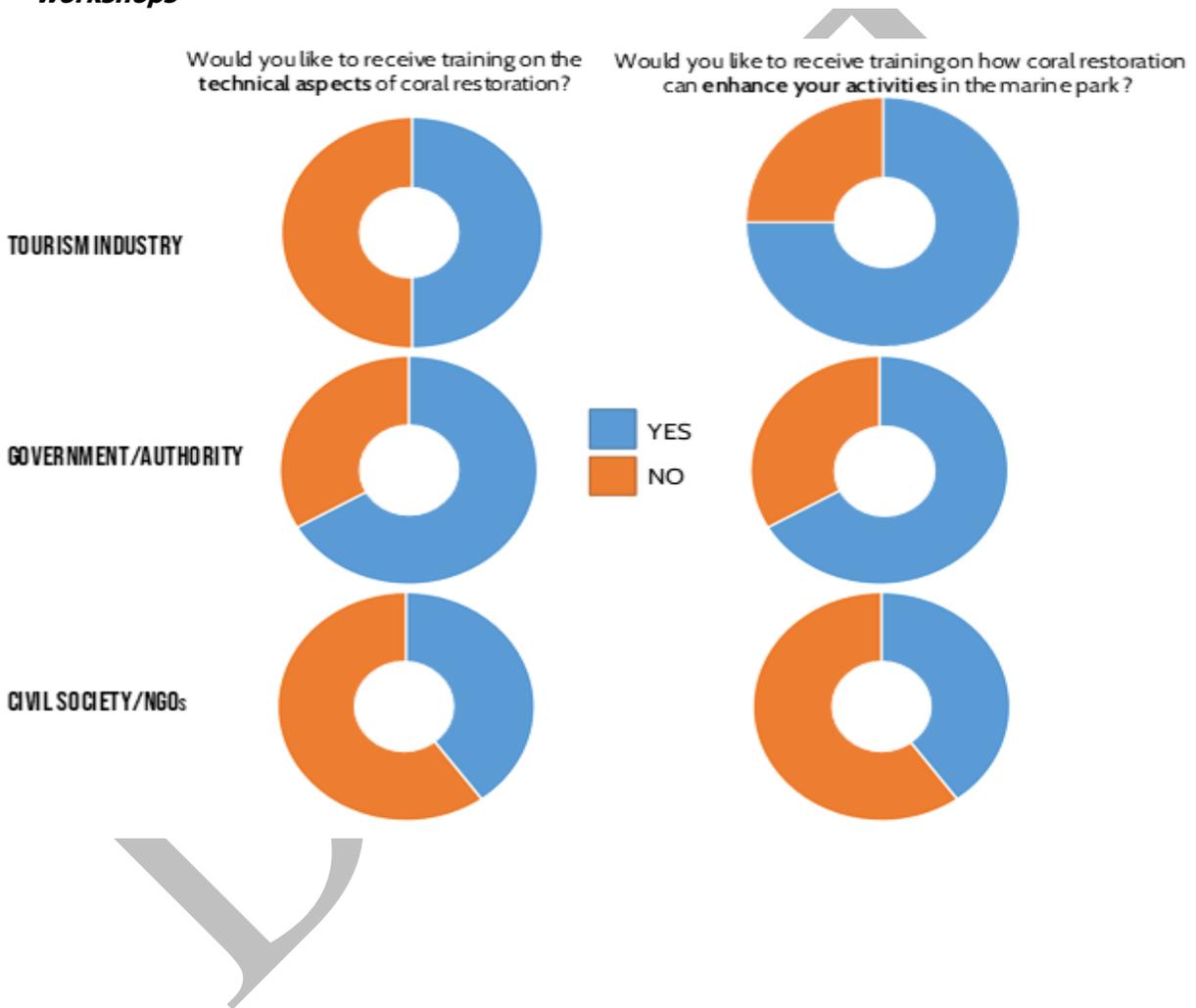
This recommendation shows the importance of having a multi-tool approach to reduce the local stressors on coral reefs which must include zoning and creation of specific anchoring or mooring areas, particularly around sensitive areas such as coral nurseries and transplantation sites.

“Detailed technical report that includes monitoring and climate impact mitigation options.”

The technical and scientific knowledge accumulated during the project needs to be distilled and disseminated to the stakeholders. It is the responsibility of all project partners under component 3 to provide detailed technical reports during the lifespan of the project.

“This will be a very time-consuming project, there are however divers like myself (and a couple of others) who could volunteer a dive day to help. it could be done as a sensitization dive also... good luck”

Figure 15: Proportion of responses per stakeholder category for two questions on training workshops



9.0 Appendices

Appendix I: Environmental and Social Management Plan

1. Introduction

This ESMP is a delivery mechanism for environmental and social mitigation and enhancement measures made in the ESIA Report (as described in Section 8 of this ESIA). The purpose of the ESMP is to help translate these recommendations into practical management actions which can be adequately resourced and integrated into the Project phases. The ESMP is a management tool used to ensure that undue or reasonably avoidable adverse impacts of construction and operation are prevented or reduced and that the positive benefits of the Project are enhanced.

2. Overview and Scope

The ESMP has been developed to meet international standards on environmental and social management performance, most notably UNDP's SES and host country (RoM & RoS) EHS regulatory requirements.

The ESMP is intended to cover the activities described in Chapter 3 of this ESIA report. It covers project activities during construction and operation and will be subject to thorough reviews prior to the commencement of activities to ensure completeness. The ESMP does not include measures for activities related to equipment and facility fabrication being done offsite/outside of the projects Results Framework. It should be noted that this provides the outline requirements for environmental management.

3. Objectives

The ESMP is essential for successful implementation of the Project's social and environmental performance. Having this framework in place ensures a systematic approach to bringing environmental and social considerations into decision making and day-to-day operations. It establishes a framework for tracking, evaluating and communicating environmental and social performance and helps ensure that environmental and social risks and liabilities are identified, minimised and managed. The ESMP will be a living document, and will continue to develop during the design and construction phase to enable continuous improvement of the Project's social and environmental performance.

In particular, the objectives of the ESMP are to:

- Ensure that all workers, subcontractors and others involved in the Project meet legal and other requirements with regard to environmental and social management;
- Incorporate environmental and social management into project design and operating procedures;
- Address concerns and issues raised in the ESIA's stakeholder consultation process and those that will likely continue to arise during the Project's lifetime;
- Serve as an action plan for environmental and social management for the Project;

- Provide a framework for implementing project environmental and social commitments (i.e., mitigation measures identified in the ESIA); and
- Prepare and maintain records of project environmental and social performance (i.e., monitoring, audits and non-compliance tracking).

4. Institutional Arrangements

Project Management Team (PMT)

PMT will have oversight/final compliance responsibility of the ESMP. The PMT will monitor the reports from the National Project Teams. They will rely on a bottom-up feedback system; from the ground-up by going through the monitoring reports and making regular site visits to inspect and verify for themselves the nature and extent of the impacts and the success or lack thereof, of the mitigation measures.

The PMT will prepare brief consolidated periodic monitoring reports for submission to the Project Steering Committee, the UNDP and the Fund on an annual basis, at mid-term and termination of the project. The Regional Project Manager will be responsible for yearly reporting to the Project Steering Committee every year on implementation measures.

National Project Team (NPT)

The National Project Team consist of the Responsible Parties and will be headed by the Project Site Coordinators (2 in Mauritius and 3 in Seychelles). Direct monitoring responsibilities will be under the Project Site Coordinators.

The NPT will collect and analyse monitoring data and also be responsible for the maintenance of management information systems and all baseline data. Monitoring will be done to ensure that actions are taken in a timely manner and to determine if actions are appropriately mitigating the risk/impact or if they need to be modified in order to achieve the intended outcome. Annual reporting will include information about the status of implementation of this ESMP, including those measures required to avoid, minimize or mitigate environmental and social risks. The reports shall also include, if necessary, a description of any corrective actions that are deemed necessary.

5. Managing Project Changes

Changes in the Project may occur due to unanticipated situations. Adaptive changes may also occur during the course of final design, commissioning or even operations. The Project will implement a formal procedure to manage changes in the Project that will apply to all project activities.

The objective of the procedure is to ensure that the impact of changes on the worker's labour and working conditions, the environment and the communities' socio-economic conditions are identified and assessed prior to changes being implemented. The management of change procedure will ensure that:

- Proposed changes have a sound technical, safety, environmental, and commercial justification;

- Changes are reviewed by competent personnel and the impact of changes is reflected in documentation, including operating procedures and drawings;
- Hazards resulting from changes that alter the conditions assessed in the ESIA will be identified and assessed and the impact(s) of changes do not adversely affect the management of health, safety or the environment;
- Changes are communicated to personnel who are provided with the necessary skills, via training, to effectively implement changes; and
- The appropriate project personnel person accepts the responsibility for the change.

As information regarding the uncertainties becomes available, the Project ESMP will be updated to include that information in subsequent revisions. Environmental and social, as well as engineering feasibility and cost considerations will be taken into account when choosing between possible alternatives.

6. Monitoring

Monitoring will be conducted to check compliance with regulatory requirements as well as to evaluate the effectiveness of operational controls and other measures intended to mitigate potential impacts. Monitoring parameters, frequency and sampling points are included in the ESMP matrix (and where relevant in the subsequent thematic specific management plans.)

7. Environmental and Social Management

The environmental and social mitigation and enhancement measures and the monitoring and management responsibility for impacts during both construction and operation/implementation of the Project are presented in the ESMP Matrix provided in Table 1.

The ESMP Matrix provides a higher-level overview of the required E&S mitigation measures that should be employed by the project and its proponents. Additional tools and management plans will need to be developed in order to address key risks and impacts that were identified as part of the ESIA report.

A full list of the key management plans and strategic E&S documents identified in the ESIA for this Project is provided below:

- Diver safety protocol/management plan
- OHS construction risk matrix and management plan
- Environmental and Social Impact Monitoring Plan
- Livelihood Action Plan

Principles	Project Activities	Identified Risks	Potential E&S Impacts if risks materialize	Mitigating measures	Indicator	Responsible for Monitoring
	Component 3	<p>certificates). As such, there is a risk that this limits direct participation to a larger number of community members.</p> <p>Fishermen at Anse Forbans may temporarily have limited boat access in this pilot site.</p> <p>There is a slight risk that not all the communities will be aware of the works carried out and results of studies</p> <p>Limited access to published papers and data may impact on the regional studies</p>	<p>Complaints may be received for temporary limited access to fishing ground at Anse Forbans</p> <p>Limited data access will hinder the work at the regional level, leading to only a limited number of people will benefit from the project work.</p>	<ul style="list-style-type: none"> - Creation of other, not so specialised jobs associated with coral nursing and restoration efforts. - Communication on grievance mechanism. - Public communication and sensitization campaign will be developed to (i) raise public awareness and engagement; (ii) facilitate communication and collaboration among stakeholders and project partners; and (iii) enable dissemination of information and lessons through tailor-made communication products, such as: <ul style="list-style-type: none"> o Creation and maintenance of project website o Use of social media o Short clips and documentary films - Ensure access to publish papers to all project team and have agreement with Accademia to have access to published data generated with support of the project fund. 	<p>training sessions organised.</p> <ul style="list-style-type: none"> - Number and quality of the project communication system. - Project website updated regularly - Communication plan approved by PSC 	PMT
<i>Marginalized and Vulnerable Groups</i>	1.1.2.3 2.1.2.1	At some community-based coral nurseries, some of the marginalized and	The marginalized and vulnerable may become more vulnerable,	- The main management and mitigation measures associated with access restrictions and the impact	- At least 30% of young people and women will be direct beneficiaries of the project	NPT Project Gender Officers

Principles	Project Activities	Identified Risks	Potential E&S Impacts if risks materialize	Mitigating measures	Indicator	Responsible for Monitoring
		<p>vulnerable group (including fishermen and women) might:</p> <p>i) Not be able to participate in the project implementation directly due to specialised nature of the skills required or not well represented in the business plan</p> <p>ii) Temporarily be unable to carry out their normal economic activities due to the coral reef restoration activities (Anse Forbans).</p>	<p>economically or otherwise, by not being able to benefit from project interventions and/or having their livelihoods impacted</p>	<p>on livelihoods for project affected peoples (including the most marginalised and vulnerable) will be explicitly addressed by the project-level Livelihood Action Plan</p> <ul style="list-style-type: none"> - Ensure the participation of women and other marginalised and vulnerable groups participate in the implementation of the project and in sensitization campaign (Some indicators in the Project Results Framework are made sensitive to the marginalized and the vulnerable.) - The project includes activities to promote alternative livelihoods to provide for alternate source of income - Selection of the restoration sites and nurseries will occur through a participatory process where fishermen can provide input on their fishing 	<ul style="list-style-type: none"> - Number of alternate livelihoods (instead of fishing) undertaken by the local community (disaggregated data) - at least 30% of all trainings/workshops and learning events will be female - at least 35% of representatives in higher level authorities participating in the project will be female. - Number of marginalised/vulnerable groups benefiting from the project 	<p>With assistance from: MOEMRFS MACCE and Economic Development Division of UNDP</p>

Principles	Project Activities	Identified Risks	Potential E&S Impacts if risks materialize	Mitigating measures	Indicator	Responsible for Monitoring
				<p>areas so that these can be avoided if possible.</p> <ul style="list-style-type: none"> - During the period that the fishing activities are curtailed, fishermen will be encouraged and provided with authorization to fish in different areas. - The project includes activities to promote alternative livelihoods to provide for alternate source of income. 		
<i>Core Labour Rights</i>	1.2.3.1 1.2.3.2 1.2.3.3 1.3.1.1. 2.1.1.3 2.2.3.1 2.2.3.2 2.3.1.1	<p>There is a risk of accidents due to mishandling of equipment or material.</p> <ul style="list-style-type: none"> - Trained SCUBA Divers may be exposed to the risk of accidents while planting corals 	Occupational hazards realized to concerned workers and/or scuba divers	<ul style="list-style-type: none"> - The main management and mitigation measures associated with OHS risks will be explicitly addressed by the project-level OHS/construction risk matrix and the Diver safety management plan/protocol - During implementation, the PMT and National Project Teams will ensure compliance with national and 	<ul style="list-style-type: none"> - Proportion of workers who wear protective equipment - Number of trainings - Level of compliance of the project with the labour laws in each country. - Number of incidences caused due to mishandling of equipment - Diver safety trainings provided 	<p>Responsible parties.</p> <p>With the assistance from:</p> <ul style="list-style-type: none"> - MOEMRFS - MACCE - MLIRET⁹⁴ - MEIC⁹⁵

⁹⁴ Ministry of Labour, Industrial Relations, Employment and Training

⁹⁵ Ministry of Employment, Immigration and Civil Status

Principles	Project Activities	Identified Risks	Potential E&S Impacts if risks materialize	Mitigating measures	Indicator	Responsible for Monitoring
		<ul style="list-style-type: none"> Other risks to workers, associated with mishandling of equipment at coral nurseries or at coral restoration sites. 		<ul style="list-style-type: none"> international labour laws and occupational and health safety laws. Adequate protection equipment for workers, training (advanced training for diving activities), insurance and access to medical decompression chamber will be provided. 		
<i>Involuntary Resettlement</i>	2.2.3.2 2.2.3.2 2.3.1.1	Some fishermen actively fishing in Anse Forbans may feel the voluntary measures set by the Anse Forbans community to restrict fishing activities at their coral restoration site is set unfairly or set without their full consent.	This may lead to involuntary economic resettlement of certain fishermen.	<ul style="list-style-type: none"> The main management and mitigation measures associated with access restrictions and potential economic displacement will be explicitly addressed by the project-level Livelihood Action Plan There will be full community engagement in the restoration activities, with a strong sustained communication effort throughout the project implementation to ensure the buy-ins and cooperation of the fishermen. Fishermen will also be encouraged to use the neighbouring fishing area during the project implementation. In case the project activities at Anse Forbans cause an 	<ul style="list-style-type: none"> Level of satisfaction of the community with the coral restoration works No of persons redirected to neighbouring fishing ground No. of complaints received for restriction of boat access. 	Responsible Parties

Principles	Project Activities	Identified Risks	Potential E&S Impacts risks materialize if	Mitigating measures	Indicator	Responsible for Monitoring
				economic issue to the local community, another restoration site (with legal protection) will be sought, since Anse Forbans is a pilot restoration site outside MPA or Reserve		
<i>Protection of Natural Habitats</i>	1.2.1.2 1.2.1.3 1.2.3.2 1.2.3.3 2.2.1.2 2.2.1.3 2.2.3.2	There is a low risk that some small areas of natural habitat in the project sites may be disturbed in the collection of the donor corals and construction of ocean-based nursery sites.	Donor colony may be affected due mishandling during collection There is a low risk that some small areas of natural habitat may be disturbed in the construction of nursery sites.	The main E&S management tool for associated with this thematic area will be the <i>E&S Impact Monitoring Plan</i> for Mauritius, Rodrigues and Seychelles. It will include a matrix on what and how to collect information to ensure proper monitoring of indicators by the Activity Partners. This will include coral reef status, water quality, area of degraded sites restored using farmed corals, area of site successfully restored using resilient species of farmed corals, number of coral fragments under culture in ocean-based nurseries and land-based nurseries, percentage of live coral cover and quality of restoration sites and other key environmental and social parameters for potential nursery sites such as, fish and other fauna and flora density, fish catch. - Since the restoration works will be carried in MPAs and Fishing Reserves, all access and activities are regulated and controlled. In the long term, the project activity will restore the Natural Habitats.	<ul style="list-style-type: none"> - Area of coral reef restored increased - Report on condition of the coral reef ecosystem - Coastal seawater quality, meeting the standards - Improved level of biodiversity of the restored coral reef compared to natural sites - Number of community members trained in handling living organisms - Number of translocated living organism 	NPT MOEMRFS (AFRC and MOI) MACCE With the assistance of SFA

Principles	Project Activities	Identified Risks	Potential E&S Impacts if risks materialize	Mitigating measures	Indicator	Responsible for Monitoring
				<ul style="list-style-type: none"> - Science-based coral reef restoration work, proposed by this project, will avoid the risk of impacting natural habitats when installing ocean nurseries and intervention in restoration sites as much as possible. - All precautions will be taken to ensure that the natural habitat remains undisturbed, as far as possible. Training will be provided to Responsible parties, workers and community members that will be directly involved in the project to ensure the protection of natural habitat. Moreover, in the event that there is need to displace some living species, same will be done in the presence of the authority (e.g. Fisheries officers of the MOEMRFS in Mauritius) - Continuous monitoring of the water quality, biodiversity and other key environmental parameters of the donor and nursery sites. 		
<i>Conservation of Biological Diversity</i>	1.3.1.1 2.3.1.1	Coral reef restoration work will be carried out mainly with identified climate	In the short term there will be a decrease in genetic diversity	<ul style="list-style-type: none"> - In the short term, asexual reproduction (fragmenting) of climate resilient species will be implemented to stabilize and 	– Number of asexually farmed corals successfully transplanted.	MOEMRFS MACCE NPT

Principles	Project Activities	Identified Risks	Potential E&S Impacts if risks materialize	Mitigating measures	Indicator	Responsible for Monitoring
		resilient species. It is possible that the focus on climate-resilient species will lead to a reduction of genetic diversity in the restored sites	at the restored sites	stop the degradation of the restoration sites. Thereafter, the genetic diversity would be increased through sexual reproduction of the transplanted corals.	<ul style="list-style-type: none"> - Number of sexually farmed corals successfully transplanted - Fish diversity (abundance and number of species) 	

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Frequency of ESMP reporting

The NPT under the supervision of the PMT will carry out regular monitoring of the risks identified in the ESMP in all project sites. The monitoring of the ESMP implementation will be carried out by the NPT with support from PMT, and reported to PSC, with any necessary updates on emerging risks and mitigation measures, as necessary.

The monitoring of the ESMP implementation will be a standing agenda item for the National Project Coordination Committee meeting and for the Regional PSC meeting so that these steering bodies will monitor the status of ESMP implementation closely, ensure that any necessary actions are taken in a timely manner, update risks and appropriate mitigating measures as necessary, and ensure all relevant national policies and standards are applied and triggered in managing environmental and social risks caused by the project interventions.

The ESMP implementation status will be reported to the Adaptation Fund on an annual basis through the annual Project Progress Reports.

Table 2: Role of Stakeholders in the implementation of the ESMP⁹⁶

Stakeholders	Role in Project Implementation	Function
Ministry of Blue Economy, Marine Resources, Fisheries and Shipping (MOEMRFS)	Project Execution Agency in Mauritius. Co-chair of Project Steering Committee (PSC) Chair of Project Coordination Committee (PCC) in Mauritius	<ul style="list-style-type: none"> • Will lead project activities in relation to the formulation of norms and strategies, the clarification of institutional roles for Marine Parks management and conservations. • Local Staff of the Ministry are responsible for planning, management, vigilance and control within the MPAs and Reserves, and also the quality of coastal water quality. • Provision of training, technical assistance and control compliance with coastal water quality and monitoring of marine biodiversity. • Ensure that there is no import/export of corals and other controlled marine organism • Conduct surveys to identify donor sites in Mauritius and Rodrigues • Conduct monitoring of restored sites in Mauritius and Rodrigues

⁹⁶ To be verified with the stakeholders during the inception phase, before they sign an ESMP Implementation Agreement with UNDP.

Stakeholders	Role in Project Implementation	Function
		<ul style="list-style-type: none"> Maintain the land-based nursey at AFRC for sexual reproduction
Ministry of Agriculture, Climate Change, and Environment (MACCE).	Project Execution Agency in Seychelles. Co-chair of PSC Chair of PCC in Seychelles	<ul style="list-style-type: none"> Will lead project activities in relation to the formulation of norms and strategies, the clarification of institutional roles for Marine Parks management and conservations. Local Staff of the Ministry are responsible for planning, management, vigilance and control within the MPAs and Reserves.
Mauritius Oceanography Institute (MOI)	Institution under the MOEMRFS. Member of the PSC and PCC (Mauritius)	<ul style="list-style-type: none"> Provision of training and technical assistance Responsible for the implementation of the genetic study Conduct surveys to identify donor sites in Mauritius and Rodrigues Conduct monitoring of restored sites in Mauritius and Rodrigues Assist in the collection of samples for the genetic connectivity and coral resilience study Conduct beach profiling Maintain the land-based nurseries at MOI for propagation of coral resilient species. Conduct current pattern analysis
Rodrigues Regional Assembly (Commission for Environment, Forestry, Tourism, Marine parks and Fisheries)	Institution responsible for Marine Parks and fisheries Member of the PCC (Mauritius)	<ul style="list-style-type: none"> Local Staff of the Ministry are responsible for planning, management, vigilance and control within the MPAs and Reserves in Rodrigues
Seychelles Fisheries Authority (SFA)	Member of the PCC (Seychelles)	<ul style="list-style-type: none"> Ensure compliance to Fisheries Act
National Coast Guard Mauritius	Member of the PCC (Mauritius)	<ul style="list-style-type: none"> Patrol at the sea to ensure compliance to Laws of the sea
National Coast Guard Seychelles	Member of the PCC (Seychelles)	<ul style="list-style-type: none"> Patrol at the sea to ensure compliance to Laws of the sea

Stakeholders	Role in Project Implementation	Function
Customs Mauritius	Member of the PCC (Mauritius)	<ul style="list-style-type: none"> Ensure that there is no import/export of corals and other controlled marine organism
Customs Seychelles	Member of the PCC (Seychelles)	<ul style="list-style-type: none"> Ensure that there is no import/export of corals and other controlled marine organism
Ministry of Labour, Industrial Relations, Employment and Training (MLIRET)	Ministry Responsible for Labour issues Member of the PCC (Mauritius)	<ul style="list-style-type: none"> Ensure compliance to Labour Act
Ministry of Employment, Immigration and Civil Status (MEIC)	Ministry Responsible for Labour issues Member of the PCC (Seychelles)	<ul style="list-style-type: none"> Ensure compliance to Labour Act
NGOs	Responsible Party, forming part of the National Team (Mauritius)	<ul style="list-style-type: none"> Responsible for the implementation of the project in Mauritius and Rodrigues and its monitoring and management
Seychelles National Parks Authority (SNPA)	Responsible Party (forming part of the National Team (Seychelles) and member of the PSC, and PCC (Seychelles)	<ul style="list-style-type: none"> Responsible for the implementation of the project in Curieuse Island and Ste Anne Island, Seychelles and its monitoring and management
Marine Conservation Society Seychelles (MCSS)	Responsible Party (forming part of the National Team (Seychelles) and member of the PSC, and PCC (Seychelles)	<ul style="list-style-type: none"> Responsible for the implementation of the project in Ste Anne Island and Anse Forbans, Seychelles and its monitoring and management
Nature Seychelles (NSey)	Responsible Party (forming part of the National Team (Seychelles) and member of the PSC, and PCC (Seychelles)	<ul style="list-style-type: none"> Responsible for the implementation of the project in Cousin Island, Seychelles and its monitoring and management

Appendix II: Stakeholder Meeting Minutes

Notes of consultative meeting with Albion Fisheries Research Centre for the Social and Environmental Safeguards consultancy

Date and time: *Wednesday 09 June 2021 from 14 00 hrs to 14 40 hrs*

Venue: *Zoom*

Were Present:

SN	Name	Designation	Organisation
1	Mrs R. Ramsurn	Regional Project Manager, Coral Restoration project (Chairperson)	United Nations Development Programme (UNDP)
2	Mr S. Ramchurn	Head of Environment Unit	
3	Dr D. D. Annandale	Social and Environmental Safeguards Specialist	
4	Mr R. Mohit	Ag. Divisional Scientific Officer, Albion Fisheries Research Centre	Ministry of Blue Economy, Marine Resources, Fisheries and Shipping
5	Mr S. Leckraz	Scientific Officer, Albion Fisheries Research Centre	
6	Ms A. Aumeeruddy	Project Assistant, Coral Restoration project (Secretary)	United Nations Development Programme (UNDP)

1.0 Opening

The Regional Project Manager (RPM) welcomed everyone and led a round of introductions. She stated that the purpose of the meeting was to introduce the Social and Environmental Safeguards (SES) Specialist, Dr David Annandale, define the parameters for his assignment in terms of timeline, process and information requirements, and to take note of any relevant concerns or recommendations they might have.

2.0 Discussions

The following issues were discussed:

SN	Topic	Discussions	Remarks/ Responsibility
1	Overview of assignment and project	The SES specialist explained that the project had been reassessed to a moderate risk level, which required that different plans be put into place to mitigate risks. The moderate risks related to the restricted access of fishers and tourism operators in the coral restoration areas and the sensitivity of the project outcomes towards climate change impacts.	

SN	Topic	Discussions	Remarks/ Responsibility
		<p>The RPM outlined the purpose of the assignment, project background, overview and status. <i>The presentation delivered is at Annex I to these notes.</i></p> <p>She also noted that the AFRC would be responsible for the table ocean-nurseries and the Mauritius Oceanography Institute (MOI) would be responsible for rope nurseries. One land nursery would be established each at AFRC and MOI. The former would cater to sexual reproduction of corals and the latter to asexual propagation of corals.</p>	
2	Social and Environmental Safeguards (SES)	<p>The SES specialist presented the key elements of the SES, comprising programming principles, project-level standards and the Social and Environmental Management System. He also explained the concepts of 'precautionary principle', 'direct, indirect, cumulative impacts', 'adaptive management' and 'mitigation hierarchy' of risks.</p>	
3	Deliverables under assignment	<p>The SES specialist presented the outputs of his assignment in accordance with his TOR namely:</p> <ul style="list-style-type: none"> (i) Updated Social and Environmental Screening Procedure (SESP) (ii) Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) (iii) Livelihood Action Plan (iv) Site Selection Plan (v) Construction Risk Plan (vi) Monitoring Plan (vii) Security Plan (viii) Training Report 	
4	Livelihood Action Plan	<p>The SES specialist explained that the Livelihood Action Plan (LAP) will cover the mitigation measures related to the economic displacement of affected groups, such as fishers and tourism operators. The LAP will be incorporated in the ESIA.</p>	
5	Construction and site	<p>The SES specialist stated that the construction risk plan would include a simple risk matrix but no detailed engineering plan. The risk matrix would cover issues such as the location of the</p>	

SN	Topic	Discussions	Remarks/ Responsibility
	selection plans for nurseries	<p>land-based nursery, the plans, the extent of land clearance required, whether it would involve displacement of people.</p> <p>Regarding site selection plans, it was noted that the exact location of the ocean-based nurseries would be based on a normative approach and rationalised from an environmental point of view. Specific coordinates would be required.</p> <p>It was agreed that the AFRC would provide details of the proposed location, maps and aerial photos to the consultant for the land-based nursery, which would be included in the ESIA. The AFRC would also provide the rationale to be used to determine the exact location of the ocean-based nurseries.</p>	AFRC
6	Security plan/ diving protocols	<p>Regarding diving guidelines to be included in the security plan, the representatives of AFRC reported that there were none at the level of the Ministry.</p> <p>Given the importance of diving and snorkelling activities for the project, the Head of Environment Unit recommended that this issue be discussed with Mauritian and Seychellois stakeholders, with a view to having a common understanding of all aspects to be considered and arrive at common guidelines across the project.</p>	

3.0 Closing

The meeting ended at 14 40 hrs with a vote of thanks from the Chairperson.

Notes of consultative meeting with Mauritius Oceanography Institute for the Social and Environmental Safeguards consultancy

Date and time: Wednesday 09 June 2021 from 11 00 hrs to 12 00 hrs
Venue: Zoom

Were Present:

SN	Name	Designation	Organisation
7	Mrs R. Ramsurn	Regional Project Manager, Coral Restoration project (Chairperson)	United Nations Development Programme (UNDP)
8	Mr S. Ramchurn	Head of Environment Unit	
9	Dr D. D. Annandale	Social and Environmental Safeguards Specialist	
10	Mr S. Bacha Gian	Research Scientist	Mauritius Oceanography Institute (MOI)
11	Ms S. Varaden	Finance and Procurement Assistant, Coral Restoration project (Secretary)	United Nations Development Programme (UNDP)
12	Ms A. Aumeeruddy	Project Assistant, Coral Restoration project (Secretary)	

4.0 Opening

The Regional Project Manager (RPM) welcomed everyone and led a round of introductions. She stated that the purpose of the meeting was to introduce the Social and Environmental Safeguards (SES) Specialist, Dr David Annandale, define the parameters for his assignment in terms of timeline, process and information requirements, and to take note of any relevant concerns or recommendations they might have.

5.0 Discussions

The following issues were discussed:

SN	Topic	Discussions	Remarks/ Responsibility
7	Overview of assignment and project	The RPM outlined the purpose of the assignment, project background, overview and status. <i>The presentation delivered is at Annex I to these notes.</i>	
8	Social and Environmental Safeguards (SES)	The SES specialist presented the key elements of the SES, comprising programming principles, project-level standards and the Social and Environmental Management System. He also explained the concepts of 'precautionary principle', 'direct, indirect, cumulative impacts', 'adaptive management' and 'mitigation hierarchy' of risks.	
9	Deliverables under assignment	The SES specialist presented the outputs of his assignment in accordance with his TOR namely:-	

SN	Topic	Discussions	Remarks/ Responsibility
		<ul style="list-style-type: none"> (ix) Updated Social and Environmental Screening Procedure (SESP) (x) Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) (xi) Livelihood Action Plan (xii) Site Selection Plan (xiii) Construction Risk Plan (xiv) Monitoring Plan (xv) Security Plan (xvi) Training Report 	
10	Relevance of Livelihood Action Plan	<p>The SES specialist explained that the Livelihood Action Plan (LAP) will cover the mitigation measures related to the economic displacement of affected groups, such as fishers and tourism operators. The LAP will be incorporated in the ESIA.</p> <p>Although it was expected that the project would result in positive long-term outcomes for the above groups, the project could entail short-term negative impacts.</p> <p>The RPM added that the NGOs which would be selected to implement coral restoration activities would be responsible to carry out livelihood surveys and Environmental and Social Impact monitoring. The matrix which would have to be used would be developed by the SES specialist.</p>	
11	Site selection plans/ ocean-based nurseries	<p>In terms of site selection plans, MOI confirmed that it would carry out the bathymetric and ocean pattern surveys to finalise the exact locations for the ocean-based nurseries and the restoration sites. The consultant highlighted that, from an impact point of view, no significant risks associated with ocean-based nurseries had been identified in the SESP.</p>	
12	Construction risk plans/ land-based nurseries	<p>The SES specialist stated that the construction risk plan would include a simple risk matrix but no detailed engineering plan. The risk matrix would cover issues such as the location of the land-based nursery, the plans, the extent of land clearance required, whether it would involve displacement of people.</p>	

SN	Topic	Discussions	Remarks/ Responsibility
		<p>The consultant explained that the ESIA would cover the aspects pertaining to the land-based nursery. The representative of MOI informed the consultant that the land-based nursery would be located on a plot adjacent to the MOI building. Woodland clearance and fencing would be required. A sea-water pumping system to and from the ocean would also be installed. The MOI would recruit workers for the nursery.</p> <p>The representative of the MOI agreed to provide details of the proposed location, maps and aerial photos to the consultant for the land-based nursery, for inclusion in the ESIA.</p>	MOI
13	Security plan/ diving protocols	<p>The representative of the MOI enquired whether any safety guidelines for diving expeditions would be elaborated under the security plan for the project. He raised the point that fishers and members of coastal communities would be trained in diving and snorkelling under the project but that there were no proper guidelines for snorkelling and diving activities in Mauritius. He reported that MOI had a safety protocol for diving but it required updating.</p> <p>The representative of MOI agreed to share the available diving protocol.</p> <p>Given the importance of diving and snorkelling activities for the project, the Head of Environment Unit recommended that this issue be discussed with Mauritian and Seychellois stakeholders, with a view to having a common understanding of all aspects to be considered.</p>	MOI PMT

6.0 Closing

The meeting ended at 12 00 hrs with a vote of thanks from the Chairperson.

Notes of consultative meeting with NGOs for the Social and Environmental Safeguards consultancy

Date and time: Thursday 10 June 2021 from 11 00 hrs to 12 30 hrs
Venue: Zoom

Were Present:

SN	Name	Designation	Organisation
13	Mrs R. Ramsurn	Regional Project Manager, Coral Restoration project (Chairperson)	United Nations Development Programme (UNDP)
14	Mr S. Ramchurn	Head of Environment Unit	
15	Dr D. D. Annandale	Social and Environmental Safeguards Specialist	
16	Mr J. Ravina	President	Ter-Mer Rodriguez
17	Mr L. Azie	Treasurer	
18	Ms Anielle Espiegle	Scientific Officer	Shoals Rodrigues
19	Mr R. Jhangeer-Khan	Rodrigues Manager	Mauritian Wildlife Foundation
20	Ms K. Young	Managing Director	Reef Conservation
21	Dr P. K. Chumun	Head of Scientific Team	Eco-Sud
22	Mr V. Seetapah	Scientific Coordinator	
23	Ms C. Griffiths	-	Mauritius Marine Conservation Society
24	Ms A. Aumeeruddy	Project Assistant, Coral Restoration project (Secretary)	United Nations Development Programme (UNDP)

7.0 Opening

The Regional Project Manager (RPM) welcomed everyone and led a round of introductions. She stated that the purpose of the meeting was to introduce the Social and Environmental Safeguards (SES) Specialist, Dr David Annandale, define the parameters for his assignment in terms of timeline, process and information requirements, and to take note of any relevant concerns or recommendations they might have.

8.0 Discussions

The following issues were discussed:

SN	Topic	Discussions	Remarks/ Responsibility
14	Overview of assignment and project	The SES specialist informed the NGOs that his purpose of his assignment was to align the project with the requirements of the UNDP SES. The project had been reassessed to a moderate risk level, which required that different plans be put into place to mitigate risks. The moderate risks related to the restricted access of fishers and tourism operators in	

SN	Topic	Discussions	Remarks/ Responsibility
		<p>the coral restoration areas and the sensitivity of the project outcomes towards climate change impacts.</p> <p>The RPM outlined the purpose of the assignment, project background, overview and status. <i>The presentation delivered is at Annex I to these notes.</i></p> <p>She elaborated on the active role expected of NGOs in the project. Through a call for proposals, NGOs will be selected for coral restoration works in Mauritius and Rodrigues. The NGO staff will be trained by the staff of the Mauritius Oceanography Institute and the Albion Fisheries Research Centre in new coral restoration techniques. These NGOs will train and work with coastal communities to carry out coral restoration activities, including the maintenance and monitoring of ocean-based nurseries. The RPM also highlighted that the selected NGOs will be expected to train local communities in snorkelling.</p> <p>The representatives of the NGOs present were invited to share any information and concerns they might have on the project pertaining to SES.</p>	
15	Social and Environmental Safeguards (SES)	<p>The SES specialist presented the key elements of the SES, comprising programming principles, project-level standards and the Social and Environmental Management System. He also explained the concepts of 'precautionary principle', 'direct, indirect, cumulative impacts', 'adaptive management' and 'mitigation hierarchy' of risks.</p>	
16	Deliverables under assignment	<p>The SES specialist presented the outputs of his assignment in accordance with his TOR namely:</p> <ul style="list-style-type: none"> (xvii) Updated Social and Environmental Screening Procedure (SESP) (xviii) Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) (xix) Livelihood Action Plan (xx) Site Selection Plan (xxi) Construction Risk Plan 	

SN	Topic	Discussions	Remarks/ Responsibility
		<p>(xxii) Monitoring Plan (xxiii) Security Plan (xxiv) Training Report</p> <p>The SES specialist informed the NGOs that their input would next be sought on the first draft of the ESIA, which is expected for July 2021.</p>	
17	Livelihood Action Plan	<p>The SES specialist explained that the Livelihood Action Plan (LAP) will cover the mitigation measures related to the economic displacement of affected groups, such as fishers and tourism operators. The LAP will be incorporated in the ESIA.</p>	
18	Security plan/ diving protocols	<p>The Head of Environment Unit queried whether the NGOs had any diving or safety protocols which could be shared so that a common approach may be devised for the project. The responses were as follows:</p> <ol style="list-style-type: none"> 1) The representative of Eco-Sud indicated that the security and responsibility aspects were usually on the dive centres. 2) The representative of Shoals Rodrigues reported that within its NGO every diver had her/his own insurance from the Mauritius Scuba Diving Association (MSDA). She recommended that a specific insurance policy be obtained for community members who would be involved in underwater activities. Moreover, PADI certified divers need to follow PADI guidelines. 3) The representative of Reef Conservation informed that the organisation had its own protocol in addition to the guidelines to be respected by the dive centres. She also noted that they had their own insurance in addition to the MSDA one. She recommended that the boats used for the activities to also be insured, given that underwater insurance does not cover people when they are aboard. Moreover, she was of the view that everyone should be fully trained and comfortable before being allowed to carry out underwater activities. 	

SN	Topic	Discussions	Remarks/ Responsibility
		<p>It was agreed that the representative of Reef Conservation would share their guidelines with the consultant.</p> <p>4) The representative of the Mauritius Marine Conservation Society suggested that a contract be established between the NGO and the dive centres or other third parties in terms of safety guidelines to be followed.</p> <p>5) The representative of the Mauritius Wildlife Foundation added that each scuba diving certification had their own safety protocols.</p>	Reef Conservation
19	Other similar projects	<p>Shoals Rodrigues representative informed that they had carried out a coral restoration project in Rodrigues funded by Duke University and recent Alternative Livelihood project. The project entailed the collection of nubbins from coral colonies for replanting in the Northern region of the island. A 70% survival rate was obtained.</p> <p>The representatives of Shoals Rodrigues were requested to share the project report.</p>	Shoals Rodrigues
20	Concerns	<p>The representative of Eco-Sud stated that conflicts arose with fishers under a previous coral restoration project. Given that many fishers viewed the <i>Acropora</i> corals as pests, they shifted to the propagation of other types of corals which, however, grew slower than <i>Acropora</i>.</p> <p>The representative of Eco-Sud was requested to share the relevant project report.</p> <p>The representative of Shoals Rodrigues also noted that there were conflicts with fishers in the South of Rodrigues where coral restoration works were carried out.</p>	Eco-Sud
21	Site selection plans for nurseries	<p>The Head of Environment Unit indicated that the project document already contained information on the sites where restoration would take place. However, as regards the locations of the nurseries, the site selection plan would contain guidelines, unless the locations were already known,</p>	NGOs

SN	Topic	Discussions	Remarks/ Responsibility
		and hence NGOs should provide the necessary initial locations. The NGOs were informed that equipment was being procured under the project to carry out ocean pattern surveys in the South East Marine Protected Area (SEMPA). The final locations of the nurseries would be decided based on the survey results and consultations with the Rodrigues Regional Assembly.	
22	Training	The RPM encouraged all the NGOs present to attend the five half-day trainings which would be carried out by the SES consultant on the use of the plans to be produced.	

9.0 Closing

The meeting ended at 12 00 hrs with a vote of thanks from the Chairperson.

Notes of consultative meeting with Rodrigues Regional Assembly for the Social and Environmental Safeguards consultancy

Date and time: *Friday 11 June 2021 from 11 10 hrs to 11 50 hrs*

Venue: *Zoom*

Were Present:

SN	Name	Designation	Organisation
25	Mrs R. Ramsurn	Regional Project Manager, Coral Restoration project (Chairperson)	United Nations Development Programme (UNDP)
26	Mr S. Ramchurn	Head of Environment Unit	
27	Dr D. D. Annandale	Social and Environmental Safeguards Specialist	
28	Mr J. P. Colin	Departmental Head	Commission for Environment and Others, Rodrigues Regional Assembly
29	Mr M. J. S. Perrine	Ag. Scientific Officer	Fisheries Research and Training Unit (FRTU), Rodrigues
30	Mr J. R. Pierre Louis	Ag. Project Manager	South East Marine Protected Area (SEMPA), Rodrigues

SN	Name	Designation	Organisation
31	Ms S. Varaden	Finance and Procurement Assistant, Coral Restoration project (Secretary)	United Nations Development Programme (UNDP)
32	Ms A. Aumeeruddy	Project Assistant, Coral Restoration project (Secretary)	

10.0 Opening

The Regional Project Manager (RPM) welcomed everyone and led a round of introductions. She stated that the purpose of the meeting was to introduce the Social and Environmental Safeguards (SES) Specialist, Dr David Annandale, define the parameters for his assignment in terms of timeline, process and information requirements, and to take note of any relevant concerns or recommendations they might have.

11.0 Discussions

The following issues were discussed:

SN	Topic	Discussions	Remarks/ Responsibility
23	Social and Environmental Safeguards (SES)	<p>The SES specialist presented the key elements of the SES, comprising programming principles, project-level standards and the Social and Environmental Management System. He also explained the concepts of 'precautionary principle', 'direct, indirect, cumulative impacts', 'adaptive management' and 'mitigation hierarchy' of risks.</p> <p>The SES Specialist informed that for the Coral Restoration project, 9 risks were identified in the most recent SESP (June 2020) out of which 7 risks were classified as "low", and two being identified as "Moderate". The moderate risks concerned the standard on resettlement/displacement and standard on climate change mitigation and adaptation</p> <p><i>The presentation delivered is at Annex I to these notes.</i></p>	
24	Deliverables under assignment	<p>The SES specialist presented the outputs of his assignment in accordance with his TOR namely:</p> <p>(i) Updated Social and Environmental Screening Procedure (SESP)</p>	

SN	Topic	Discussions	Remarks/ Responsibility
		<ul style="list-style-type: none"> (ii) Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) (iii) Livelihood Action Plan (iv) Site Selection Plan (v) Construction Risk Plan (vi) Monitoring Plan (vii) Security Plan (viii) Training Report 	
25	Ocean-based nurseries	<p>The Head of Environment Unit clarified that in Rodrigues only ocean-based nurseries will set up.</p> <p>For the project, coral fragments will be taken from ocean-based nurseries to the transplantation sites, which will be within the South East Marine Protected Area (SEMPA).</p>	
26	Livelihood Action plan	<p>The Project Manager for SEMPA informed that there might be conflicts with fishers in case the sites chosen for restoration and transplantation result in fishing grounds being displaced.</p> <p>He recommended that awareness raising activities be carried out with fishers, divers, neighbouring hotels, kite surfers and other stakeholders to sensitise them on the benefits of the project to them.</p> <p>The SES specialist indicated that there might be a possible need for compensation, which would not necessarily be in cash. A questionnaire will be designed for NGOs/implementing partners to determine the needs thereof. The RPM added that the NGOs which would be selected to implement coral restoration activities would be responsible to carry out annual livelihood surveys and Environmental and Social Impact monitoring.</p>	
27	Input from stakeholders	<p>The SES specialist informed the stakeholders from Rodrigues that their input would next be sought on the first draft of the ESIA, which was expected for the end of June 2021.</p>	

12.0 Closing

The meeting ended at 11 50 hrs with a vote of thanks from the Chairperson.

Notes of consultative meeting with the Marine Conservation Society of Seychelles for the Social and Environmental Safeguards consultancy

Date and time: *Tuesday 15 June 2021 from 11 00 hrs to 12 00 hrs*

Venue: *Zoom*

Were Present:

SN	Name	Designation	Organisation
33	Mrs R. Ramsurn	Regional Project Manager, Coral Restoration project (Chairperson)	United Nations Development Programme (UNDP)
34	Mr S. Ramchurn	Head of Environment Unit	
35	Ms P. Sushil Nair	National Project Coordinator, Coral Restoration project (Seychelles)	
36	Ms M. Benoit	Administrative and Finance Assistant, Coral Restoration project (Seychelles)	
37	Dr D. D. Annandale	Social and Environmental Safeguards Specialist	
38	Mr C. Mason-Parker	Chief Executive Officer	Marine Conservation Society of Seychelles
39	Mr L. Barret	Project Leader	
40	Ms R. Somers	Scientific Coordinator	
41	Ms A. Aumeeruddy	Project Assistant (Mauritius), Coral Restoration project (Secretary)	United Nations Development Programme (UNDP)

13.0 Opening

The Regional Project Manager (RPM) welcomed everyone and led a round of introductions. She stated that the purpose of the meeting was to introduce the Social and Environmental Safeguards (SES) Specialist, Dr David Annandale, define the parameters for his assignment in terms of timeline, process and information requirements, and to take note of any relevant concerns or recommendations they might have.

14.0 Discussions

The following issues were discussed:

SN	Topic	Discussions	Remarks/ Responsibility
28	Overview	<p>The SES Specialist stated that the project risk had been upgraded from low to moderate in the most recent SESP (June 2020). 9 risks were identified out of which 7 risks were classified as "low", and two being identified as "Moderate". The moderate risks concerned the standard on resettlement/displacement and standard on climate change mitigation and adaptation.</p> <p>Given the moderate risk level, assessment studies and management plans were needed as part of the Social and Environmental Safeguards (SES) requirements.</p> <p>The SES specialist gave an overview of the project status.</p>	
29	Social and Environmental Safeguards (SES)	<p>The SES specialist presented the key elements of the SES, comprising programming principles, project-level standards and the Social and Environmental Management System. He also explained the concepts of 'precautionary principle', 'direct, indirect, cumulative impacts', 'adaptive management' and 'mitigation hierarchy' of risks.</p> <p><i>The presentation delivered is at Annex I to these notes.</i></p>	
30	Deliverables under assignment	<p>The SES specialist presented the outputs of his assignment in accordance with his TOR namely:</p> <ul style="list-style-type: none"> (ix) Updated Social and Environmental Screening Procedure (SESP) (x) Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) (xi) Livelihood Action Plan (xii) Site Selection Plan (xiii) Construction Risk Plan (xiv) Monitoring Plan (xv) Security Plan (xvi) Training Report <p>The SES specialist informed the Activity Partner that specific monitoring and reporting requirements would have to be met as part of the plans produced under the assignment. These</p>	

SN	Topic	Discussions	Remarks/ Responsibility
		would include precautionary measures to be implemented at nursery sites.	
31	Information required	<p>The SES specialist stated that he would request for information, by email, on the site selection procedures for nurseries, the consultations held with stakeholders, recruitment and training of staff and emergency preparedness plans.</p> <p>The SES specialist requested that project progress reports be shared with him. MCSS agreed to share the links for the locations of the nurseries by the following week.</p>	<p>MCSS</p> <p>MCSS/PMT</p>
32	Security plan	In terms of security measures, the representatives of MCSS informed that their diving expeditions were governed by PADI guidelines. Moreover, all their divers were certified Rescue Divers at the minimum.	
33	Conflicts	The representatives of MCSS informed that there were no conflicts with the fishing community at Anse Forbans, given that the location was not appropriate for fishing.	
34	Project workers	The representatives of MCSS stated that their project workers are volunteers, staff from hotels, community and some are employed by the NGO. However, given that the nurseries are in shallow water (less than 18 M), all of them have the minimum open water diving certificate.	
35	Training	The Regional Project Manager informed MCSS that training on the implementation of the monitoring plans would be held over five half-days around the end of September 2021 or the beginning of October 2021.	

15.0 Closing

The meeting ended at 12 00 hrs with a vote of thanks from the Chairperson.

Notes of consultative meeting with the Seychelles National Parks Authority for the Social and Environmental Safeguards consultancy

Date and time: *Tuesday 15 June 2021 from 14 00 hrs to 14 30 hrs*

Venue: *Zoom*

Were Present:

SN	Name	Designation	Organisation
42	Mrs R. Ramsurn	Regional Project Manager, Coral Restoration project (Chairperson)	United Nations Development Programme (UNDP)
43	Ms P. Sushil Nair	National Project Coordinator (Seychelles), Coral Restoration project	
44	Ms M. Benoit	Administrative and Finance Assistant (Seychelles), Coral Restoration project	
45	Dr D. D. Annandale	Social and Environmental Safeguards Specialist	
46	Ms N. Pierre Einfeldt	Research Scientist	Seychelles National Parks Authority
47	Ms P. Theresine	Assistant	
48	Ms A. Aumeeruddy	Project Assistant (Mauritius), Coral Restoration project (Secretary)	United Nations Development Programme (UNDP)

16.0 Opening

The Regional Project Manager (RPM) welcomed everyone and led a round of introductions. She stated that the purpose of the meeting was to introduce the Social and Environmental Safeguards (SES) Specialist, Dr David Annandale, define the parameters for his assignment in terms of timeline, process and information requirements, and to take note of any relevant concerns or recommendations they might have.

17.0 Discussions

The following issues were discussed:

SN	Topic	Discussions	Remarks/ Responsibility
36	Overview	The SES Specialist stated that the project risk had been upgraded from low to moderate in the most recent SESP (June 2020). 9 risks were identified out of which 7 risks were classified as "low", and two being identified as "Moderate".	

SN	Topic	Discussions	Remarks/ Responsibility
		<p>The moderate risks concerned the standard on resettlement/displacement and standard on climate change mitigation and adaptation.</p> <p>Given the moderate risk level, assessment studies and management plans were needed as part of the Social and Environmental Safeguards (SES) requirements.</p> <p>The SES specialist gave an overview of the project status.</p>	
37	Social and Environmental Safeguards (SES)	<p>The SES specialist presented the key elements of the SES, comprising programming principles, project-level standards and the Social and Environmental Management System. He also explained the concepts of 'precautionary principle', 'direct, indirect, cumulative impacts', 'adaptive management' and 'mitigation hierarchy' of risks.</p> <p><i>The presentation delivered is at Annex I to these notes.</i></p>	
38	Deliverables under assignment	<p>The SES specialist presented the outputs of his assignment in accordance with his TOR namely:-</p> <ul style="list-style-type: none"> (xvii) Updated Social and Environmental Screening Procedure (SESP) (xviii) Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) (xix) Livelihood Action Plan (xx) Site Selection Plan (xxi) Construction Risk Plan (xxii) Monitoring Plan (xxiii) Security Plan (xxiv) Training Report 	
39	Information required	<p>The SES specialist requested for information on the site selection procedures and coordinates for nurseries, the consultations held with stakeholders, recruitment and training of staff and emergency preparedness plans.</p> <p>The representatives of SNPA indicated that no photographs of the nurseries were currently available. They would share</p>	

SN	Topic	Discussions	Remarks/ Responsibility
		the documentation available at their end, including their progress reports.	SNPA
40	Security plan	In terms of security measures, the representatives of SNPA stated that they had their own diving protocol and additional guidelines they were following in the context of the Covid-19 pandemic. The representative of SNPA agreed to share the above-mentioned protocols.	SNPA
41	Personnel	The representatives of SNPA informed that the personnel working for the project were full-time contractual staff. They also reported that interns also sometimes worked on project activities.	
42	Way forward	The SES specialist agreed to follow-up with SNPA after the latter had shared their project documentation.	

18.0 Closing

The meeting ended at 14 30 hrs with a vote of thanks from the Chairperson.

Notes of consultative meeting with Nature Seychelles for the Social and Environmental Safeguards consultancy

Date and time: *Wednesday 16 June 2021 from 14 00 hrs to 14 38 hrs*

Venue: *Zoom*

Were Present:

SN	Name	Designation	Organisation
49	Mrs R. Ramsurn	Regional Project Manager, Coral Restoration project (Chairperson)	United Nations Development Programme (UNDP)
50	Mr S. Ramchurn	Head of Environment Unit	
51	Ms P. Sushil Nair	National Project Coordinator (Seychelles), Coral Restoration project	
52	Ms M. Benoit	Administrative and Finance Assistant (Seychelles), Coral Restoration project	
53	Dr D. D. Annandale	Social and Environmental Safeguards Specialist	
54	Dr N. Shah	Chief Executive	Nature Seychelles

SN	Name	Designation	Organisation
55	Ms K. Henri	Director	
56	Ms S. Ramkalawan	Project Coordinator	
57	Ms A. Aumeeruddy	Project Assistant (Mauritius), Coral Restoration project (Secretary)	United Nations Development Programme (UNDP)

19.0 Opening

The Regional Project Manager (RPM) welcomed everyone and led a round of introductions. She stated that the purpose of the meeting was to introduce the Social and Environmental Safeguards (SES) Specialist, Dr David Annandale, define the parameters for his assignment in terms of timeline, process and information requirements, and to take note of any relevant concerns or recommendations they might have.

20.0 Discussions

The following issues were discussed:

SN	Topic	Discussions	Remarks/ Responsibility
43	Overview	<p>The SES Specialist stated that the project risk had been upgraded from low to moderate in the most recent SESP (June 2020). 9 risks were identified out of which 7 risks were classified as "low", and two being identified as "Moderate". The moderate risks concerned the standard on resettlement/displacement and standard on climate change mitigation and adaptation.</p> <p>Given the moderate risk level, assessment studies and management plans were needed as part of the Social and Environmental Safeguards (SES) requirements.</p> <p>The SES specialist gave an overview of the project status.</p> <p>The Regional Project Manager highlighted that Nature Seychelles (NSey) was the Activity Partner in Seychelles with the highest budget and the only one responsible for both land and ocean nurseries.</p>	
44	Social and Environmental Safeguards (SES)	<p>The SES specialist presented the key elements of the SES, comprising programming principles, project-level standards and the Social and Environmental Management System. He also explained the concepts of 'precautionary principle',</p>	

SN	Topic	Discussions	Remarks/ Responsibility
		<p>'direct, indirect, cumulative impacts', 'adaptive management' and 'mitigation hierarchy' of risks.</p> <p><i>The presentation delivered is at Annex I to these notes.</i></p>	
45	Deliverables under assignment	<p>The SES specialist presented the outputs of his assignment in accordance with his TOR namely:-</p> <ul style="list-style-type: none"> (xxv) Updated Social and Environmental Screening Procedure (SESP) (xxvi) Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) (xxvii) Livelihood Action Plan (xxviii) Site Selection Plan (xxix) Construction Risk Plan (xxx) Monitoring Plan (xxxi) Security Plan (xxxii) Training Report 	
46	Information required	<p>Dr Shah was of the view that the SES requirements were coming rather late in the project and stakeholders should have been apprised earlier. The SES specialist agreed that the production of environmental safeguard plans was unusual at this point of the project. The representatives of Nature Seychelles were requested to share their progress reports.</p>	NSeY
47	Project risks	<p>The representatives of NSeY stated that all their intervention sites were within Marine Protected Areas. As such, no fishing was allowed there and there was little no incidence of poaching.</p> <p>He also reported that the boat and engine of the organisation, which were procured under the project, had been stolen and that they were currently in the process of filing the insurance claim. The unstable rate of the SCR vis-à-vis USD in the context of the Covid situation was considered as an added risk.</p>	

SN	Topic	Discussions	Remarks/ Responsibility
48	Safeguards for land-based nurseries	<p>In terms of safeguards respected for land-based nurseries, Dr Shah indicated that Seychelles was governed by strict country and town planning and Environmental and social impact legislation. He reported that NSey had applied for planning permission for the fencing around the land-based nursery site, which was located on land leased to the organisation by the Government of Seychelles. If the planning authority decided that an Environmental and Social Impact Assessment was required, then this would have to be carried out.</p> <p>NSey agreed to send the relevant legislation, in addition to the site plans, photographs and coordinates.</p>	NSey
49	Ocean-based nurseries	<p>The representatives of NSey informed that there was no relevant legislation pertaining to ocean-based nurseries. The Aquaculture Department was currently overseeing the matter and NSey was envisaging to sign a Memorandum of Understanding with them.</p> <p>NSey agreed to send the relevant maps and coordinates for the ocean-based nurseries.</p>	NSey
50	Staffing/security	<p>The representatives of NSey informed that no community members were involved in coral restoration works in the ocean nurseries, given that they were at depths of 12 to 20 m. Only adequately certified and insured divers from the local dive centre and the Fire and Rescue Service were allowed to work in the ocean nurseries.</p> <p>The representative of Nature Seychelles agreed to share their diving guidelines.</p>	NSey

21.0 Closing

The meeting ended at 14 38 hrs with a vote of thanks from the Chairperson.

Appendix III: Project SESP

The completed template, which constitutes the Social and Environmental Screening Report, must be included as an annex to the Project Document. Please refer to the [Social and Environmental Screening Procedure](#) for guidance on how to answer the 6 questions.

Project Information

Project Information	
1. Project Title	Restoring marine ecosystem services by rehabilitating coral reefs to meet a changing climate future
2. Project Number	5736
3. Location (Global/Region/Country)	Mauritius and Seychelles

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?

Briefly describe in the space below how the Project mainstreams the human-rights based approach

The project integrates overarching human rights principles in order to strengthen social and environmental sustainability by including measures to assist the Republics of

Mauritius and Seychelles to protect and restore coral reefs, which will in turn provide for food, safety, drinking water, safe shelter and for decent work for local communities. The project is designed to bring socioeconomic and climate change adaptation benefits particularly for the vulnerable. UNDP consistently applies the Human Rights Based approach (HRBA) in all programming, taking into account the responsibilities of the duty-bearers and the entitlements of the right-holders. The project design includes the identification of the government authorities as the primary duty-bearers in ensuring effective management of the coral populations in the lagoons to ensure sustainable biodiversity protection as well as food security in the longer term, and recognizes the importance of partnerships across various sectors, as well as the integral engagement and involvement of the rights-holders themselves in this agenda. These rights-holders include fishers, NGOs and other community members participating in the project interventions with the objective of improving livelihoods.

Healthy coral reef ecosystems provide the vulnerable coastal communities and coast- and ocean-based industries with protection from various extreme events as well as economic opportunities. Degraded reef ecosystems will leave the coastal communities and coast- and ocean-based industries vulnerable. In order to restore, maintain and protect coral reef ecosystems, community engagement and involvement is crucial, and the project will require efforts from all, not just from the government. For the restoration, protection and conservation of targeted coral reef ecosystems (i.e., to achieve the intended climate change adaptation benefits, including the long-term food security), the project might require temporary or permanent economic displacement of some stakeholders, should any of their current activities or practices be considered harmful to the coral reef ecosystems. Thorough stakeholder consultations and engagement will be ensured by the project, its implementing party (UNDP) and responsible parties, prior to any physical, social or economic displacement, in order to ensure that the project interventions would not result in any violation of human rights, intentionally or unintentionally.

Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment

Gender and social issues will be fully considered in the project, and gender accountability is a cross-cutting issue that will be tracked as part of the project's M&E system. During the project development phase, a gender assessment was completed, including among other issues, the description of the role played by women in relation to different project components (gender baseline). The findings from the Gender Assessment informed the project logframe, project's proposed interventions and the development of the Gender Action Plan. The implementation of the Gender Action Plan will ensure that the project will effectively contribute to the gender equality and women's empowerment efforts.

The project will pursue a gender-sensitive approach whereby gender equality in participation will be strongly promoted. Under all components, the principle of gender equality will be promoted in terms of both numbers involved and degree of participation in decision-making. Equal participation of men and women in decision-making forums and in capacity building activities will be encouraged. Furthermore, UNDP will encourage qualified women applicants for positions under the project in line with UNDP rules and regulations.

Briefly describe in the space below how the Project mainstreams environmental sustainability

The project will directly address and aim to improve environmental sustainability through coral reef restoration in Mauritius and Seychelles. Mauritius and Seychelles are highly vulnerable to climate change in several ways, none more so than the impact that elevated sea temperature is having on their coral reefs. Coral reefs provide a wealth of ecosystem services including food, coastal protection, recreational and tourism use, biodiversity benefits, and regulating services, all of which are vital to the local economies and food security of human populations living in vulnerable Small Island Developing States (SIDS) such as these two countries. However, in both Mauritius and Seychelles, corals have suffered heavy mortalities from bleaching events (see details below in section 5), caused by climate-change induced sea warming, over recent decades. Healthy and robust coral reefs, through the provision of these ecosystem services, ensure that coastal populations and their coast- and ocean-based economic activities become more resilient to the adverse impacts of climate change.

In order to mainstream environmental sustainability particularly related to coral restoration work, project interventions are designed not only to strengthen the technical capacity of both countries to promote climate resilient coral restoration but also to institutionalize the coral restoration work fully in the relevant government and partner institutions AND to engage non-government actors, such as private sectors and coastal communities in socially and environmentally sustainable economic activities that will improve coastal livelihoods and food security and will protect coral reefs and reef ecosystems at the same time.

Technical and institutional capacity strengthening, ensuring active involvement of all concerned stakeholders and promoting sustainable businesses which will support the coral restoration efforts will all contribute to environmental sustainability.

Part B. Identifying and Managing Social and Environmental Risks

<p>QUESTION 2: What are the Potential Social and Environmental Risks? <i>Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any "Yes" responses.). If no risks have been identified in Attachment 1 then note "No Risks Identified" and skip to Question 4 and Select "Low Risk". Questions 5 and 6 not required for Low Risk Projects.</i></p>	<p>QUESTION 3: What is the level of significance of the potential social and environmental risks? <i>Note: Respond to Questions 4 and 5 below before proceeding to Question 6</i></p>			<p>QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?</p>
<p>Risk Description</p>	<p>Impact and Probability (1-5)</p>	<p>Significance (Low, Moderate, High)</p>	<p>Comments</p>	<p>Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.</p>
<p>Risk 1: The Project could lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups. The project may also exclude some vulnerable/marginalized groups (such as fishermen and women), who may not be able to participate in the project implementation directly due to the specialised nature of the skills required for the implementation of coral restoration activities.</p> <p>Principle 1.1, 1.2 Principle 3: Standard 5.2</p>	<p>I = 2 P =2</p>	<p>Low</p>	<p>In those areas where the project will implement coral restoration activities (in order to maximize the effectiveness of the coral restoration interventions to be supported by the project) some restrictions might be put on fishers who have been fishing there and/or tourism operators who have been conducting tourism activities either during a limited period or permanently.</p> <p>However, once the coral populations have been restored in the long term, the healthy and more robust coral reefs are expected to naturally increase fish populations, which will have positive impacts on fishing and tourism activities in the areas where corals are restored and beyond. The impact is considered to be of low magnitude, limited in scale (site</p>	<p>Assessment: To ensure that the project meets the high standards required by UNDP, the Adaptation Fund, and host country regulation, preparation of an Environmental and Social Impact Assessment (ESIA) by an independent international specialist has been included within the framework of the project. The ESIA will assess (amongst others) risks relating to human rights and the inclusion and participation of affected communities/individuals.</p> <p>Management: During the period that economic activities (Fishing, tourism, etc) will be curtailed in certain designated areas to restore corals, fishers and tourism</p>

			<p>specific) and in duration (temporary) and can be managed and/or mitigated with relatively uncomplicated accepted measures. Further, a long-term impact can be considered positive rather than negative.</p>	<p>operators will be provided with authorization to operate in different areas. The inclusion and meaningful participation of vulnerable groups will be systematically embedded throughout the project design and stakeholder engagement processes. A grievance redress mechanism will be developed, and the monitoring and evaluation process will be designed to record any inequalities or grievances that arise within the project and wider community, with attention being brought to the Project Steering Committee.</p> <p>Training and capacity building will be integrated into project design in order to support duty bearers (particularly members of the project steering committee, project staff and consultants and government officials) so they understand their responsibilities for human rights, and how to effectively implement, monitor and report on the required safeguards related issues.</p>
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<p>Risk 2: The Project could potentially restrict availability, quality of and access to, resources (for fishermen and tourism operators) through the measures set by the Anse Forbans community to restrict certain activities at the coral restoration site. The site at Anse Forbans will be the only site that will have newly imposed restrictions placed upon it, however, through the enforcement of pre-existing restrictions on access/activities at the other MP sites, communities and individuals may also be impacted.</p> <p>Principle 3: Standard 5.2</p>	<p>I = 3 P = 4</p>	<p>Moderate</p>	<p>In areas where coral restoration activities are prioritized, activities that will hamper coral restoration efforts will be restricted. This includes some fishing and tourism activities, both authorized and unauthorized. While the size of areas and the duration of restriction are expected to be limited, the significance of the risk is considered to be moderate for those who are subject to this restriction.</p> <p>It is important to note that a long-term impact from this limited restriction is expected to be positive rather than negative, even for those who will be affected by the restriction, considering that the restored coral reefs will support more fish and potentially increase the fish catch even outside of the restricted areas.</p> <p>This risk is limited in scale (site-specific) and in duration (temporary) and can be managed and/or mitigated with relatively uncomplicated accepted measures</p>	<p>Assessment: Based on the Moderate assessment of this and other risks, and to ensure that the project meets the high standards required by UNDP and Government, preparation of an Environmental and Social Impact Assessment by relevant specialists has been included within the framework of the project. The ESIA will include a robust assessment of access-restriction related risks and impacts, with an indicative Livelihood Restoration Plan and survey questionnaire (for use by relevant Activity Partners) being produced as part of the accompanying ESMP.</p> <p>An emphasis will be placed on strong stakeholder consultation and engagement throughout the project implementation period, building upon stakeholder engagement activities that started during the project development phase to secure buy-in from the stakeholders.</p> <p>Management: The consideration and needs of project-affected people (such as fishermen and tourism operators) who may suffer adverse impacts relating to imposed restrictions to access of certain sites will be factored in to the project design and delivery. This shall also be reflected in the stakeholder engagement strategy/plan. Stakeholders will be fully engaged in the discussions related to the selection of the areas that will be subject to restrictions, the expected potential long-term (economic) benefits to fisheries and tourism, and the potential alternatives to</p>
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				be offered to compensate for any project-induced loss.
<p>Risk 3: Some Project activities are proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), proposed for protection. There is a risk that some (small) areas of natural habitat in the project sites may be disturbed in the collection of the donor corals and the construction of ocean-based nurseries.</p> <p>Principle 3: Standard 1.2, 1.3</p>	<p>I = 1 P = 5</p>	<p>Low</p>	<p>Except for Anse Forbans, all coral restoration activities will be undertaken in legally protected areas. The proposed interventions are expected to bring positive impacts, not negative, to critical habitats and environmentally sensitive areas; thus, the risk of this project interventions making any adverse impacts on critical habitats or environmentally sensitive areas are low.</p>	<p>Assessment & Management: Any interventions proposed by the project in or adjacent to critical habitats and/or environmentally sensitive areas including legally protected areas will be carefully designed and monitored to avoid intended or unintended negative impacts through careful selection of techniques and methodologies. Science-based coral reef restoration work, proposed by this project, will avoid the risk of impacting natural habitats when installing ocean nurseries and intervention in restoration sites as much as possible. All precautions will be taken to ensure that the natural habitat remains undisturbed, as far as possible. Training will be provided to Responsible Parties, workers and community members who will be</p>

				directly involved in the project to ensure the protection of natural habitat.
<p>Risk 4: The Project will involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods</p> <p>Principle 3: Standard 1.2, 1.3 Standard 5.2</p>	I = 1 P = 5	Low	Project will involve changes to the use of marine resources (coral reefs). The areas selected for coral reef protection and to pilot the coral restoration activities will be more closely monitored and protected from external activities and shocks. As such, it is expected that the changes will have positive impacts on habitats and ecosystems. There are potentially negative impacts on livelihood of some people for a limited period (see the risk 2). The risk is considered low.	Assessment & Management: The management measures to reduce or minimize potential adverse impacts on livelihoods are described under Risk 2.
<p>Risk 5: The Project involves the production and/or harvesting of aquatic species (i.e. corals) . As such, risks relating to the handling of such species exist.</p> <p>Principle 3: Standard 1.2, 1.3, 1.7, 1.9</p>	I = 1 P = 5	Low	The Project promotes active coral restoration in land-based laboratories and in the ocean/lagoons. It is expected to have positive impacts on coral reefs and the ecosystems they support in the long run, including fish. The risk is considered low.	Assessment & Management: The project will utilize and nurture corals to promote and accelerate coral restoration activities. The selection of corals will be done carefully based on the best scientific knowledge available to date, as well as relying on research to be conducted as part of the project's activities, for their climate resilience and for their suitability to be planted where the coral restoration activities are expected. Thus, any adverse impacts expected from coral restoration activities are expected to be minor.
<p>Risk 6: The project poses potential risks and vulnerabilities related to occupational health and safety due to physical safety hazards during Project construction, and operation. OHS risks for the project are primarily associated with the handling of specialist</p>	I = 3 P = 2	Moderate	Some activities will involve scuba-diving in the ocean to plant the corals and monitor their growth. Trained scuba divers may be at risk of accidents (as well as injury relating to the operation and handling of equipment during such activities).	<p>Assessment: Analysis and assessment of OHS risks will be included within the scope of the project's ESIA.</p> <p>Management: All project staff working in the lagoon on coral restoration and</p>

<p>equipment and machinery by scuba divers.</p> <p>Principle 3: Standard 3.7</p>			<p>Communities will also be trained in snorkelling activities to conduct coral restoration activities and monitoring of restored sites.</p>	<p>having to work underwater will have to be qualified divers and also trained in providing first aid in the event of any mishap. An Occupational Health and Safety management checklist/protocol will be produced (as part of the project's ESMP) that will detail the required actions, monitoring, and reporting elements for the respective responsible parties concerning OHS protocols. During implementation, the PMT and National Project Teams will ensure compliance with national and international labour laws and occupational and health safety laws. The terms and conditions of engaging project workers and sub-contractors shall follow all host country law and UNDP SES requirements. OHS management plans (primarily for the constructions works to be undertaken for the land-based nurseries) and protocols for diver/snorkeller safety will also be established.</p>
<p>Risk 7: The outcomes of the Project are sensitive and/or vulnerable to potential impacts of climate change. Rising sea temperatures may result in increased coral bleaching.</p> <p>Principle 3: Standard 2.2, Standard 3.5</p>	<p>I = 4 P = 2</p>	<p>Moderate</p>	<p>It is widely believed that climate change will increase the temperature of the lagoon further in the future and thus potentially lead to more coral bleaching and death in the long term when no action is taken. The project cannot avoid the potential impacts of climate change and the project outcomes are vulnerable to them. However, the project interventions are intended to reduce the adverse impacts of climate change felt by the vulnerable communities in the two countries by making the coral populations more resilient to climate change.</p>	<p>Assessment: During the conduct of the ESIA, the assessments will fully consider climate vulnerability by adopting local and expert advice over areas most at risk as well as species, habitats or communities that could be affected.</p> <p>Management: The project is designed to enhance Mauritius and Seychelles resilience to climate change to reduce the adverse impacts of climate change felt by the most vulnerable. Demonstrations on the ground will show how integrated natural resources</p>

				management can be a key tool in addressing climate change.
<p>Risk 8: The Project could possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation) relating to restrictions imposed upon fishers (particularly at the Anse Forbans site).</p> <p>Principle 3: Standard 1.3, Standard 5.2</p>	I=3 P=2	Moderate	Only one site is potentially affected, namely Anse Forbans in Seychelles. The possibility of involuntary resettlement is considered to be remote owing to the fact that there are other fishing areas around. Moreover, in the long term, the project will result in increase in fish populations, which will improve the livelihoods of the concerned populations.	<p>Assessment: While the potential for economic displacement (as a result of voluntarily imposed restrictions on access to certain sites, most notably Anse Forbans) is relatively minor, and site specific, this risk still persists. The project’s ESIA will assess the risk of economic displacement further. In addition, a Livelihoods survey questionnaire will also be developed which will seek to establish a livelihoods baseline from which the responsible parties and activity partners can continue to monitor and measure the impact to direct and indirect project beneficiaries.</p> <p>Management: Mitigation and management measures for livelihood/economic displacement issues will be include within the projects ESMP. A training session will also be conducted during the initial stages of project implementation that will provide activity partners with the key tools, knowledge and capacity to ensure that the required mitigation and management measures are adequately undertaken throughout the project’s duration.</p>

QUESTION 4: What is the overall Project risk categorization?

Select one (see SESP for guidance)		Comments
<i>Low Risk</i>	<input type="checkbox"/>	
<i>Moderate Risk</i>	<input checked="" type="checkbox"/>	<p>Eight individual risks have been identified as part of this screening exercise, four of which have been categorized as Moderate, and four which have been determined to be Low. As such, the project has been categorized Moderate Risk.</p> <p>The risks identified as part of this SESP have confirmed the need for the following SES-related studies, assessments and management plans:</p> <ul style="list-style-type: none"> • ESIA (including information on the site selection criteria/plans) • ESMP • Livelihoods Action Plan (including a survey questionnaire to be used as a guideline by Responsible Parties and Activity Partners to measure and monitor the indicators and evaluate the impact of the project on direct and indirect beneficiaries) • Environmental and Social Impact Monitoring Plans for the Republic of Mauritius and the Republic of Seychelles, including a matrix on what and how to collect information to ensure proper monitoring of indicators for the Activity Partners to report • OHS and construction risk matrix and management plan

	<p style="text-align: right;">High Risk</p> <input type="checkbox"/>	<ul style="list-style-type: none"> • Provision of training to PMU/stakeholders to raise awareness of/capacity to manage safeguards risks • Integration of the above and other risk mitigation measures into project design, budget, governance arrangements and PMU.
QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?		
	Check all that apply	Comments
	Principle 1: Human Rights	X Risk 1
	Principle 2: Gender Equality and Women's Empowerment	<input type="checkbox"/>
	1. Biodiversity Conservation and Natural Resource Management	X Risk 3 Risk 4 Risk 5 Risk 8
	2. Climate Change Mitigation and Adaptation	X Risk 7
	3. Community Health, Safety and Working Conditions	X Risk 6 Risk 7
	4. Cultural Heritage	<input type="checkbox"/>
	5. Displacement and Resettlement	X Risk 1 Risk 2 Risk 4 Risk 8
	6. Indigenous Peoples	<input type="checkbox"/>
	7. Pollution Prevention and Resource Efficiency	<input type="checkbox"/>

SESP Attachment 1. Social and Environmental Risk Screening Checklist

Checklist Potential Social and Environmental Risks		Answer (Yes/No)
Principles 1: Human Rights		
1.	Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	Yes
2.	Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? ⁹⁷	Yes
3.	Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	Yes
4.	Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?	No
5.	Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	No
6.	Is there a risk that rights-holders do not have the capacity to claim their rights?	No
7.	Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
8.	Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment		
1.	Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2.	Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	No
3.	Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
4.	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? <i>For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being</i>	No
Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below		

⁹⁷ Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management		
1.1	Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services?	No
<i>For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes</i>		
1.2	Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	Yes
1.3	Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	Yes
1.4	Would Project activities pose risks to endangered species?	No
1.5	Would the Project pose a risk of introducing invasive alien species?	No
1.6	Does the Project involve harvesting of natural forests, plantation development, or reforestation?	No
1.7	Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	Yes
1.8	Does the Project involve significant extraction, diversion or containment of surface or ground water? <i>For example, construction of dams, reservoirs, river basin developments, groundwater extraction</i>	No
1.9	Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)	Yes
1.10	Would the Project generate potential adverse transboundary or global environmental concerns?	No
1.11	Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area? <i>For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.</i>	No
Standard 2: Climate Change Mitigation and Adaptation		
2.1	Will the proposed Project result in significant ⁹⁸ greenhouse gas emissions or may exacerbate climate change?	No
2.2	Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	Yes

⁹⁸ In regards to CO₂, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? <i>For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding</i>	No
Standard 3: Community Health, Safety and Working Conditions		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	No
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No

3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No
3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	No
3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	Yes
3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	Yes
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No

Standard 4: Cultural Heritage		
4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No

Standard 5: Displacement and Resettlement		
5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	Yes

5.3	Is there a risk that the Project would lead to forced evictions? ⁹⁹	No
5.4	Would the proposed Project possibly affect land tenure arrangements and/or community-based property rights/customary rights to land, territories and/or resources?	No
Standard 6: Indigenous Peoples		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	No
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	Would the proposed Project potentially affect the rights, lands and territories of indigenous peoples (regardless of whether Indigenous Peoples possess the legal titles to such areas)?	No
6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.4	Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.5	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No
6.6	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.7	Would the Project potentially affect the traditional livelihoods, physical and cultural survival of indigenous peoples?	No
6.8	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
Standard 7: Pollution Prevention and Resource Efficiency		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or nonroutine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	No
7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	No
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? <i>For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol</i>	No
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No
7.5	Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	No

⁹⁹ Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

Appendix IV: List of key stakeholders and community identified- SAMP

Category	Name	Affiliation
Academia	Dr Nuette Gordon	University of Seychelles
Academia	Gerard Rocamora	University of Seychelles
Academia	Holger Anlauf	University of Seychelles
Academia	Island Biodiversity Centre(UniSey)	University of Seychelles
Academia	Jerome Harlay	University of Seychelles
Academia	Kelly Hoareau	University of Seychelles
Academia	Stuart Laing	University of Seychelles
Academia	Sue Ansell	International School Seychelles
Academia	Seychelles Maritime Academy	Seychelles Maritime Academy
Civil Society	Georgina Beresford (Wise Oceans)	Wise Oceans
Civil Society	Helena Sims	TNC
Civil Society	Krishna Ashok	Wise Oceans
Civil Society	Leo Barret	MCSS
Civil Society	Nina Andrews	MCSS
Civil Society	Rowana Walton	Wise Oceans
Civil Society	Suketu Patel	Moyenne Foundation
Civil Society	Victoria Alis	SSTF
Fisherman	Derrick Labrosse	Fisherman Roche Caiman
Fisherman	Neddy Labrosse	Fisherman Roche Caiman
Fisherman	Terrence Labrosse	Fisherman Roche Caiman
Government/Authority	Allen Cedras	ex Government/Authority
Government/Authority	Anderson Nourrice	Government/Authority
Government/Authority	Bernard Bijoux	Government/Authority
Government/Authority	Dainise Quatre	Government/Authority
Government/Authority	Dean	Government/Authority
Government/Authority	Denis Matatiken	ex Government/Authority
Government/Authority	Eldon	Government/Authority
Government/Authority	Gilberte Gendron	ex Government/Authority
Government/Authority	Isabelle Ravinia	Government/Authority
Government/Authority	James Mougat	Government/Authority
Government/Authority	Jude Bijoux	Consultant - Coral Reef Policy
Government/Authority	Lenny	Government/Authority
Government/Authority	Marie-May Muzungaila	MACCE
Government/Authority	Remi Asman	Government/Authority
Government/Authority	Rodney Quatre	Environnemental officer - Port extension Project
Government/Authority	Roland	Government/Authority
Government/Authority	Selby Remie	Government/Authority
Government/Authority	Seychelles Coral Reef Policy	
Government/Authority	Unels Bristol	ex Ste Anne MNP worker
Others	Angelique Pouponneau	SeyCCAT
Others	Daig Romain	PAF project
Others	Daniella Payet	SSTF
Others	Daniella Payet2	SSTF
Others	Diana Kroner	SSTF
Others	Elke Talma	PCU
Others	Fabrina Molle	PCU
Others	Jan Robinson	Consultant
Others	Jeanne Mortmer	Consultant
Others	John Nevill	Consultant - Coral Reef Policy
Others	Preethi Sushil	UNDP
Others	Rachel Bristol	SAMNP Management Plan Consultant

Others	Ryan Meriton	C Lover
Others	Vania Robert	SeyCCAT
Resident	Andie Delafontaine	Cerf Island Resident
Resident	Andy Calais	Cerf Island Resident
Resident	Anne Delafontaine	Cerf Island Resident
Resident	Antoine Gardner	Cerf Island Resident
Resident	Bernadette Gardner	Cerf Island Resident
Resident	Cerf Sanctuary	Cerf Sanctuary
Resident	Delta Ward-Horner	Cerf Island Resident and hotel owner (L'Habitation)
Resident	Dominique Pompee	Cerf Island Resident and property caretaker
Resident	Doris Calais	Cerf Island resident
Resident	Edme Calais	Cerf Island Resident
Resident	Elsie Blanchard	Cerf Island Resident
Resident	Gillian Horner/Calais?	Cerf Island resident
Resident	James Delafontaine	Cerf Island Resident
Resident	Judith Strashoon	Cerf Island Resident and private estate manager
Resident	Kevin Horner	Cerf Island Resident and Fairy Tern Chalets owner
Resident	Marina Costa	Cerf Island Resident
Resident	Philippe Blanchard	Cerf Island Resident
Resident	Rita	Manager Villa de Cerf
Resident	Wendy Horner	Cerf Island Resident and Fairy Tern Chalets owner
Tourism industry	Burak	Round Island Resort
Tourism industry	Christopher Paris	Creole TSS (excursion manager)
Tourism industry	Coco Charter Seychelles	
Tourism industry	Davilia Micock	Masons Travel (head of excursions)
Tourism industry	Diving Cruises Seychelles Ltd	Diving Cruises Seychelles Ltd
Tourism industry	Dominic Horner	L'habitation
Tourism industry	Forum Varsani	manager VJ Cerf resort
Tourism industry	Forum Varsani	Cerf Island Resort
Tourism industry	Forum Varsini	Cerf Island Resort
Tourism industry	Francis Savy	Ste Anne Island developer
Tourism industry	Jadore Seychelles Excursions	Jadore Seychelles Excursions
Tourism industry	Lisette Hoareau	Teddys Glass Bottom Boats/Jolly Rodger Restaurant (Moyenne)
Tourism industry	Michael / Aisha	Dolphin Nemo
Tourism industry	Michael Mason	Masons Travel
Tourism industry	Mrs Anna Marzocchi	Managing Director Villa de Cerf
Tourism industry	Mrs Wilna Tirant	HR manager Club Med
Tourism industry	Nesi Croisières	
Tourism industry	Okeanos Cruise Croisière	Okeanos Cruise Croisière & Location de Catamaran aux Seychelles
Tourism industry	Prisca Barbe	Creole TSS
Tourism industry	Sailfishing Charters	
Tourism industry	Sea-Tribe Yacht Charters	Sea-Tribe Yacht Charters
Tourism industry	SeyVillas	SeyVillas
Tourism industry	Shubham	Cerf Island Resort
Tourism industry	Stephanie Azemia	excursion boat operator
Tourism industry	Tania	Teddy's Glass Bottom Boat
Tourism industry	Teddy's Glass Bottom Boat	Teddy's Glass Bottom Boat
Tourism industry	Masons Travel	Masons Travel
Tourism industry	Creole Travel	Creole Travel
Tourism industry	Semi Sub	Semi Sub
Tourism industry	Club Med - St Annes	Club Med - St Annes
Tourism industry	Calipso	Calipso
Tourism industry	Azuro Charters	Azuro Charters
Tourism industry	VPM Yacht Charter	VPM Yacht Charter
Tourism industry	Island Hopper	Island Hopper

Appendix V: Stakeholder Meetings

Social and Environmental Safeguard Specialist - Stakeholder consultations (via MS Teams) June 2021

Meeting no.	Stakeholder category	Stakeholders	Proposed Date	Proposed Time
1	Responsible Parties in Mauritius	Mauritius Oceanography Institute	Mon 07 Jun 21	10 00 - 12 00
2		Albion Fisheries Research Centre	Mon 07 Jun 21	14 00 - 16 00
3	Main stakeholder in Rodrigues	Rodrigues Regional Assembly	Tues 08 Jun 21	10 00 - 12 00
4	NGOs in Mauritius and Rodrigues	Ecosud Mauritian Wildlife Foundation Reef Conservation Ecomode Society Mauritius Scuba Diving Association Mauritius Marine Conservation Society Association of Pleasure Craft Operators in South East Marine Megafauna Conservation Association Shoals Rodrigues Ter-Mer Rodriguez	Wed 09 Jun 21	10 00 - 12 00
5	Responsible Party in Seychelles	Ministry of Agriculture, Climate Change and Environment Programme Coordinating Unit (PCU)	Mon 14 Jun 21	10 00 - 12 00
6	Activity Partners in Seychelles	Seychelles National Parks Authority (SNPA)	Tues 15 Jun 21	10 00 - 12 00
7		Marine Conservation Society of Seychelles	Tues 15 Jun 21	13 00 - 15 00
8		Nature Seychelles	Wed 16 Jun 21	10 00 - 12 00