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Third Project Steering Committee Meeting for the WIOSAP Project and First Project Steering Committee meeting for the SAPPHIRE project

25-27 June 2019
Durban, South Africa

THIRD PSC MEETING FOR WIOSAP PROJECT: SESSION Ve - PROJECT PROPOSAL ON ASSESSMENT OF BLUE CARBON ECOSYSTEM (SEAGRASS) AROUND THE ISLAND OF MAURITIUS.

UNITED NATIONS ENVIRONMENT PROGRAMME
NAIROBI CONVENTION

WIOSAP FULL PROPOSALS TEMPLATE

Call title: Implementation of the Strategic Action Programme for the protection of the Western Indian Ocean from land-based sources and activities (WIO-SAP)

Participating countries: Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, South Africa, Tanzania [and France (not project beneficiary)]

Executing organization: Nairobi Convention Secretariat

Duration of demo projects: 2 years

Stage of the call: Full proposals

Submission dateline: 5th March 2019

(Maximum 20 pages including cover page, budget and annexes)

INSTRUCTIONS

Organisation Name	Ministry of Ocean Economy, Marine Resources, Fisheries and Shipping
Project Title	Assessment of Blue Carbon Ecosystem (Seagrass) around the island of Mauritius
Address	Albion Fisheries Research Centre, Albion, Mauritius
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Registration Details	Type of organisation: Governmental Country: Mauritius Year: NA Registration Number: NA

Executive Summary: Seagrass ecosystems have been recently acknowledged for their blue carbon potential. Blue carbon, is a recent concept used to refer to organic carbon stored in coastal and marine ecosystems. Mangroves, salt marshes and seagrass beds possess enormous potential to capture, store and release carbon. These blue carbon ecosystems are considered important natural carbon sink sources. Unfortunately, seagrass beds are globally being impacted by multiple anthropogenic stressors from coastal development, nutrient enrichment, sediment runoff, physical disturbance, commercial fishing practices, invasive species, diseases, aquaculture, algal blooms and global warming. The result of seagrass loss worldwide is leading to a loss of associated ecosystem services, which makes it a contributing factor to the degradation of the ocean's health. In Mauritius, the main pressure on seagrass emanates from tourism development in region where seagrass beds are cleared out for a more appealing lagoon to the tourists. Despite the study survey conducted on seagrass, there is a current lack of knowledge on seagrass species composition, density distribution and a knowledge gap on the efficiency of seagrass beds to act a natural carbon sink in Mauritius. The purpose of the project is to investigate the current status of seagrasses around the coast of Mauritius and to determine their carbon sink potential to further enabling the develop of management strategies, to formulate policies gearing towards conservation and rehabilitation of seagrass ecosystems in Mauritius and to generate blue carbon credit. This study would yield a map showing the areas of the distribution pattern and diversity of the seagrasses around the coast of Mauritius. Furthermore, it is also expected that during the fieldwork, critical areas with constant degradation would be identified. Long term seagrass monitoring transects will be established and monitoring will be carried out twice yearly. Overall, both the outcomes from the seagrass assessments and the determination of the blue carbon storage will give substantial data to determine the specific location and the targeted seagrass species to be used for the initiation of restoration programme after the 2 years. The project will also help in the formulating of national policy for the protection and conservation of seagrass around the coast of Mauritius and in national reports.

I. BACKGROUND AND JUSTIFICATION[1]

Seagrasses are flowering plants (angiosperms) that are adapted to live entirely submerged in the marine environment. There are about 60 species of seagrasses worldwide and 13 species are known to occur in the Western Indian Ocean (Gullstrom et al. 2002). They often grow forming extensive meadows which can be monospecific (single species) or multispecific where more than one species of seagrass can co-exist. They are situated in shallow areas of the lagoon up to 20 meters or deeper if environmental conditions permit photosynthesis. Seagrass beds play key ecological roles in marine and estuarine environment. They procure important ecological services such as maintaining the populations of commercially exploited fisheries by providing nursery and feeding grounds for juveniles to complete their life cycle or provide a safe haven from larger predators (Jackson et al. 2001). They also serve as a valuable direct food source to a myriad of organisms and support high biodiversity. They also act as stabilizing agents in coastal sedimentation and erosion processes and as a natural filter for pollutants and nutrients. Seagrass has strong linkages with coral reefs and mangroves forming one of the most productive coastal

habitat. Seagrass can play a critical role in buffering the effects of ocean acidification on adjacent coral reefs (Anthony et al. 2011).

Seagrass ecosystems have been recently acknowledged for their blue carbon potential. Blue carbon, is a recent concept used to refer to organic carbon stored in coastal and marine ecosystems. Mangroves, salt marshes and seagrass beds possess enormous potential to capture, store and release carbon (The Nature Conservancy, 2018). These blue carbon ecosystems are considered important natural carbon sink sources. They absorb carbon dioxide from the atmosphere and the ocean for the process of photosynthesis, but not only, they can sequester and store carbon for a long time in the underlying sediments (McKenzie and Unsworth, 2009). Marine sediments are often anoxic and accumulate sediment vertically where organic carbon can be preserved over significantly long time scales (Kennedy et al. 2010). In a study by Kennedy et al. (2010), carbon burial by seagrass meadows has been estimated to be between 48 to 112 Tg yr-1 making seagrass beds a hotspot for carbon sequestration.

Unfortunately, seagrass beds are globally being impacted by multiple anthropogenic stressors from coastal development, nutrient enrichment, sediment runoff, physical disturbance, commercial fishing practices, invasive species, diseases, aquaculture, algal blooms and global warming (Duarte, 2002; Short et al. 2014). The result of seagrass loss worldwide is leading to a loss of associated ecosystem services, which makes it a contributing factor to the degradation of the ocean's health (Waycott et al. 2009). Reported seagrass losses on a global scale, have led to increased awareness of the need for seagrass protection, monitoring, management, and rehabilitation or restoration.
Seagrass restoration refers to returning a seagrass bed to a pre-existing condition in terms of same species composition, distribution, abundance, and ecosystem function while seagrass rehabilitation implies returning seagrass beds to an area where seagrass previously existed but not necessarily with the same species composition, abundance or equivalent ecosystem function (Seddon, 2004). Escalating loss in seagrass beds reported worldwide and recognizing the importance of seagrass ecosystem in the coastal zone; scientists and resource managers are investigating ways to protect existing seagrass beds while restoring degraded ones. Restoration/rehabilitation of seagrass beds has been recognized as a means to accelerate the recovery of seagrass beds within reasonable timeframes in an area which has been widely studied (Wear, 2006). Greiner et al. (2013) also showed with evidence that seagrass habitat restoration enhances carbon sequestration in the coastal zone.

In Mauritius, the main pressure on seagrass emanates from tourism development in region where seagrass beds are cleared out for a more appealing lagoon to the tourists (ESA report, 2009; Daby, 2003). The seagrass meadows distribution has been receding since the advent of coastal development and intensification of the tourism industry in Mauritius. On the other hand, overfishing and anthropogenic activities also affect the seagrass beds via mechanical destruction and pollutant inputs. In 2000, the Albion Fisheries Research Centre conducted a study on seagrass distribution and species composition at two sites around Mauritius; Albion and Pointe aux Canonniers. The purpose of the survey was to have a preliminary understanding of the status of seagrass in Mauritius and to build up a baseline reference on the species distribution and composition for the establishment of a long term monitoring plan with the objective to improve the management of the coastal zone of Mauritius. The dominant species identified in Albion was *Halodule uninervis* followed by *Halophile stipulacea*, *Halophila ovalis*, and *Syringodium isoetifolium* while *Syringodium isoetifolium* was predominant at Pointe aux Canonniers followed

by *Thalassodendron ciliatum*, *Halophila ovalis*, *Halodule uninervis*, and small patches of *Halophile stipulacea.* The total seagrass cover at Albion was 20,890 m^2 over a total surveyed area of 72,000 m^2 while at Pointe aux Canonniers, the total seagrass cover was 1,252 m^2 out of 2,500 m^2 surveyed, (Paupiah et al., 2000).

Despite the study survey conducted on seagrass, there is a current lack of knowledge on seagrass species composition, density distribution and a knowledge gap on the efficiency of seagrass beds to act a natural carbon sink in Mauritius. Monitoring seagrass beds represent a valuable tool to help and improve coastal management practices and allow to identify environmental problem before any further damage or loss, areas that require conservation measures, understand natural or man-made variations in seagrass resources, and develop benchmarks against which performance and effectiveness can be measured. The purpose of the project is to investigate the current status of seagrasses around the coast of Mauritius and to determine their carbon sink potential to further enabling the develop of management strategies, to formulate policies gearing towards conservation and rehabilitation of seagrass ecosystems in Mauritius and to generate blue carbon credit.

II. PARTNERSHIPS

The project will be led by the Marine Science Division of the Albion Fisheries Research Centre which has the mandate and training to carry out the said research. However, this project would also be implemented under the Coral Reef Network, a network englobing the Research Institutions, Governmental Bodies, Non-Governmental bodies, private and public sectors. The network has for mission to work in collaboration to:

(i) Harmonize monitoring methodology and data collection,
(ii) Updating of the new database for data storage,
(iii) Drafting of regional/national report on the coral reef/ marine biodiversity status in Mauritius.

The key institutions which will be directly involved in the project are listed below:

Partner Name	Mandate	Role in the project	Resources partner will provide
1. University of Mauritius	Carry out research	Assist in project implementation	Provision of equipment facilities
2. National Coast Guard	Security at Sea	Assist in provision of logistics	Boat facilities
3. Eco-Sud (NGO)	Research, Conservation & Awareness	Assist in project implementation	Man power
4. Reef Conservation (NGO)	Research, Conservation & Awareness	Assist in project implementation	Man power

The NGOs will participate according to region-wise whereby the Reef Conservation will overlook and assist in work in the North region of Mauritius while the Eco-Sud will assist in the South of Mauritius. Surveys and samplings will be brought to the facilities of the Albion Fisheries Research Centre where most of the processing will be carried out in the lab. Some of processing will be carried out in the facilities of the University of Mauritius depending on the materials and equipment needed.

III. OBJECTIVES

A. Overall objective

To investigate the current status of seagrasses around the coast of Mauritius and to determine their carbon sink potential to further enabling the development of management strategies, to formulate policies gearing towards conservation and rehabilitation of seagrass ecosystems in Mauritius and to generate blue carbon credit.

B. Immediate/specific objectives

a) Conduct surveys on the density and distribution of seagrass around Mauritius Island
b) Establish permanent seagrass monitoring stations at specific sites around the island
c) Carry out sediment coring at specific seagrass sites around the island to determining carbon storage
d) Analysis of carbon sequestration content in sediment
e) Calculation/generation of blue carbon credit

IV. PROJECT IMPLEMENTATION AND MANAGEMENT PLAN (See definitions in Annex 3)

A. Expected project results and indicators

This study would yield a map showing the areas of the distribution pattern and diversity of the seagrasses around the coast of Mauritius. Furthermore, it is also expected that during the fieldwork, critical areas with constant degradation would be identified. Long term seagrass monitoring transects will be established and monitoring will be carried out twice yearly. The highly regulated collaborative network (Coral Reef Network) in place will be used to conduct and coordinate the different activities.

Through the island-wide assessment and continuous monitoring of the seagrass diversity and distribution, the following would be the indicators:

i. A map depicting the distribution and diversity of seagrass species in the lagoons of Mauritius
ii. Acquisition of continuous long term monitoring data on seagrass and its health status
iii. Yearly report on Seagrass distribution through long term monitoring

Through the sediment coring for the determination of carbon storage, the following would be the indicators:

i. Carbon storage capacity of the different species of seagrass around Mauritius.
ii. Generate blue carbon credit

Overall, both the outcomes from the seagrass assessments and the determination of the blue carbon storage will give substantial data to determine the specific location and the targeted seagrass species to be used for the initiation of restoration programme after the 2 years.

The outcome of the project will help in the formulating of national policy for the protection and conservation of seagrass around the coast of Mauritius and in national reports.

The indicators are:

i. Formulation of adequate regulation to be included in the Fisheries and Marine Resources Act.
ii. Become an offset partner for external buyers of carbon credits
iii. Make Seagrass be accounted for into the national inventory of the UNFCCC

B. Project activities and work plan

The project is being planned over 2 years and the work plan table at annex. The project will be comprised of three components:

Component 1: Seagrass Assessment around the island
Component 2: Seagrass Monitoring Program and
Component 3: Blue Carbon Storage Capacity in Seagrass

Component 1: Seagrass Assessment around the Island

It is important to document seagrass species composition, distribution and density to be able to identify areas requiring conservation measures. Adequate information acquired from surveys on seagrass will help to prevent further significant areas or species being lost. In order to detect changes that occur through disturbance (man-made and natural), it is necessary to first map the distribution and density of existing seagrass beds and to confirm the existing ESA maps findings. The preliminary survey will also be used to create a repertoire of seagrass diversity and density around Mauritius for future use and reference in the conservation and scientific community as well as to be used to identify the stations for establishment of the long term seagrass monitoring around Mauritius. These findings will also be monitored to determine the extent of natural variation in seagrass habitat (natural die-back) before estimating their loss and/or gain due to natural and anthropogenic disturbances.

From the ESA report, according to Montaggioni & Faure (1980), a total of 9 species of seagrass have been identified to grow in Mauritius waters. These are namely: *Halophila ovalis, Halophila stipulacea, Halophila balfourii, Halodule univervis, Halodule wrightii, Cymodocea ciliata, Cymodocea serrulata, Thalassodendron ciliatum* and *Syringodium isoetifolium*.
However, during the workshop on 'Seagrass identification, monitoring and mapping' conducted in mid July 2018 and funded by the Indian Ocean Commission, only 5 species of seagrass have been identified in Le Morne, namely, *Halophila ovalis, Halophila stipulacea, Halodule univervis, Thalassodendron ciliatum* and *Syringodium isoetifolium*.

The preliminary study would include species identification to verify the species encountered in the coastal areas around Mauritius. The coasts around Mauritius will be divided into eleven (11) zones following the ESA map
Water quality parameters (chemical, microbiology) will be measured during the ground truthing surveys to have a first baseline data for establishment of the long term monitoring.

Component 2: Seagrass Monitoring Program

Following the preliminary survey, the results would be used as baseline reference for site selection for the establishment of the long term seagrass monitoring program. The number of sites for the establishment of the permanent transects would depend on the density, diversity of seagrass species, on their blue carbon storage capacity among others. The spatial and temporal changes in seagrass abundance and species composition, will be measured and interpreted with respect to prevailing environmental conditions and remedial actions would be initiated accordingly.
Water quality parameters (chemical, microbiology) will be measured in parallel to the seagrass parameters. Seagrass depends on good water quality to maintain their ecological functions in parallel to the seagrass parameters. Seagrass depends on good water quality to maintain their ecological functions. Any disturbance in water quality can alter the biogeochemistry of seagrasses affecting their conditions in the long term. The results will be used to formulate future policies and regulations to improve the management of the coastal zone with regards to seagrass ecosystems protection and conservation in Mauritius.

Component 3: Blue Carbon Storage Capacity in Seagrasses

Seagrass ecosystem are important natural carbon sinks but their efficiency varies significantly depending on species composition, sediment properties and environmental factors. It is proposed to conduct a core based estimates of carbon storage and sequestration in seagrass beds in Mauritius. By measuring the carbon sequestered within the underlying sediments of seagrass beds, one can determine which species, sediment type and site location is more favourable for optimum carbon capture and sequestration. Understanding the efficiency of seagrass beds to store and sequester carbon in the sediments, could have important implications for management and protection of the seagrass habitat to continue to act as a natural carbon sink (Dahl et al. 2016).
The coring will be conducted in two phases in parallel with the preliminary survey during the first year and when the seagrass monitoring during the second year. Three sediment cores will be taken for carbon storage analysis. Isotopic analysis of soil carbon to determine stored carbon origin within sediment will also be investigated for the purpose of blue carbon determination.
Two sites for each three species (*Thalossodendron ciliatum, Syringodium isoetifolium and Halodule uninervis*), will be selected and three cores will be sampled at each site (3 species, two sites for each 3 species, 3 cores at each site = a total of 18 cores). It is

expected that the coring samples will be sent to CSIRO, a research institution in Australia, for the analysis of the core estimate of carbon storage. Based on the core carbon storage estimation along with the preliminary data collected on seagrass, policy will be formulated to support protection of seagrass ecosystems along with the development of conservation strategies such implementing permanent seagrass monitoring program and rehabilitation of degraded seagrass areas.

C. Project Beneficiaries

Mauritius will benefit as a whole in terms of being a carbon credit seller. Seagrass acts as nurseries and spawning grounds to various commercial fish species, thus, it is expected that the artisanal fishery be enhanced in terms of catch with regards to different commercial fish species when the project will be fully implemented. As the two main output would be to develop a policy for the conservation of seagrass around the island and as well to move towards seagrass restoration after the two years of the project.

The project will also enhance the biodiversity evolving around seagrass beds which will attract sea turtles and other marine organisms as well.

NGOs, Universities and other stakeholders from the Coral Reef Network will benefit from the knowhow and techniques that would be used for the sediment coring and monitoring. Most stakeholders will benefit from technology transfer which can be replicable as well to the Western Indian Ocean regions.

D. Implementing agency management of project

The main implementing agency would be the Albion Fisheries Research Centre who is a governmental organisation under the Ministry of Ocean Economy, Marine Resources, Fisheries & Shipping and who has the mandate to conduct research on ecosystem which include the conservation and management of the seagrass.

However, throughout the established coral reef network, all stakeholders will be able to participate in terms of gathering the different techniques for coring of sediment. Workshops will be carried out as well to harmonise a standard method for the monitoring of seagrass around the island.

V. SUSTAINABILITY AND REPLICABILITY

After the project is completed, the on-going monitoring and the future rehabilitation program will be sustained through inclusion of required annual budget through the government budget.

It is also suggested to seek other funding avenues after the project to implement the seagrass rehabilitation in identified degraded areas in Mauritius. The services of an expert in seagrass rehabilitation would be required.

Through annual reports and open access publications, the whole project would be available for other agencies in the Western Indian Ocean to replicate the work on seagrass monitoring and blue carbon.

VI. PROJECT MONITORING AND EVALUATION

The project monitoring and evaluation would be monitored using specific indicators that will give an insight of the advancement of the project. The indicators would be:

i. the number of surveys carried out around Mauritius to assess the diversity, density and distribution of the different seagrass species
ii. the number of permanent transect established
iii. the continuous data collection during the monitoring
iv. the amount of sediment coring conducted and samples processed

A workplan would be established to adequately use the resources available for the smooth going of the project.

VII. BUDGET (Total budget for the Output applied for MUST NEVER exceed the ceiling given in the background document)

A total budget of 200, 000 USD

Annex1: Example of workplan (to be expanded as appropriate)

Task	Responsible	Year 1												Year 2											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Overall Objectives: To investigate the current status of seagrasses around the coast of Mauritius and to determine their carbon sink potential to further enabling the development of management strategies, to formulate policies gearing towards conservation and rehabilitation of seagrass ecosystems in Mauritius and to generate blue carbon credit.																									
Outcome 1.0	Island-wide assessment and continuous monitoring of the seagrass diversity and distribution																								
Output 1.1	A map depicting the distribution and diversity of seagrass species in the lagoons of Mauritius																								
Activity 1.1.1	Carry out assessment surveys and Ground Truthing																								
Activity 1.1.2	Compilation of data to design map																								
Activity 1.1.3	Yearly report																								
Outcome 2.0	Determination of the blue carbon storage and generation of blue carbon credit																								
Output 2.1	Determination of carbon sequestration																								
Activity 2.1.1	Selection of sites																								
Activity 2.1.2	Sediment Coring																								

Activity 2.1.3	Pre-processing of samples																								
Activity 2.1.4	Analysis of samples																								
Activity 2.1.5	Interpretation of data for blue carbon credit																								
Activity 2.1.6	Report																								

Annex 2: Logical Framework

Project title: Assessment of Blue Carbon Ecosystem (Seagrass) around the island of Mauritius			
Project overall objective: To investigate the current status of seagrasses around the coast of Mauritius and to determine their carbon sink potential to further enabling the development of management strategies, to formulate policies gearing towards conservation and rehabilitation of seagrass ecosystems in Mauritius and to generate blue carbon credit.			
Project Results	**Outputs**	**Activities**	**Costs /output (US$)**
Outcome 1: Island-wide assessment and continuous monitoring of the seagrass diversity and distribution	O.1.1 A map depicting the distribution and diversity of seagrass species in the lagoons of Mauritius	A.1.1.1 Carry out assessment surveys and Ground Truthing A.1.1.2 Compilation of data to design map A. 1.1.3 Establishment and Monitoring of Long term monitoring transects A.1.1.4 Yearly report	**Sub - total** **100, 000**
	O.1.2	A 1.2.1 A 1.2.2 A 1.2.3. A1.2.4	
Outcome 2.0 Determination of the blue carbon storage and generation of blue carbon credit	O.2.1 Determination of carbon sequestration	A 2.1.1 Selection of sites A 2.1.2 Sediment Coring A.2.1.3 Pre-processing of samples A 2.1.4 Analysis of samples A 2.1.5 Interpretation of data for blue carbon credit A 2.1.6 Report	**Sub – total** **100, 000**

	O.2.2		

Annex 3: Project Monitoring Plan

Project Title: Assessment of Blue Carbon Ecosystem (Seagrass) around the island of Mauritius			
Project overall objective: To investigate the current status of seagrasses around the coast of Mauritius and to determine their carbon sink potential to further enabling the development of management strategies, to formulate policies gearing towards conservation and rehabilitation of seagrass ecosystems in Mauritius and to generate blue carbon credit.			
Project Results	**Indicator**	**Target/baseline**	**Method**
Outcome 1.0 Island-wide assessment and continuous monitoring of the seagrass diversity and distribution	IND.1.1 1. the number of surveys carried out around Mauritius to assess the diversity, density and distribution of the different seagrass species 2. the number of permanent transect established 3. the continuous data collection during the	Target: 1. A map depicting the distribution and diversity of seagrass species in the lagoons of Mauritius 2. Monitoring of seagrass over the long term 3. Restoration of seagrass beds Baseline: Few studies have been carried out by the University of Mauritius and the Albion Fisheries Research Centre. Publications are available.	The coasts around Mauritius will be divided into eleven (11) zones following the ESA map produced in 2009. However, no ground trothing work has been carried out to verify the work. Water quality parameters (chemical, microbiology) will be measured during the ground truthing surveys to have a first baseline data for establishment of the long term monitoring. Following the preliminary survey and selection of permanent sites for seagrass monitoring, permanent transects are to be established at selected sites. The proposed Seagrass Monitoring Framework for the Western Indian Ocean will be used as guiding protocol for the seagrass monitoring program (Annex 6). The proposed framework was worked on by participants of the Seagrass Network workshop conducted in Reunion Island in 2017. The contents of the protocol were adapted from international protocols developed by SeagrassWatch (2001) and SeagrassNet

	monitoring		(2006) for intertidal seagrass monitoring. Water quality parameters, including; chemical, physical and microbiological will be monitored as well at the established monitoring sites
Outcome 2.0 Determination of the blue carbon storage and generation of blue carbon credit	IND.2.1. 1. Carbon storage capacity of the different species of seagrass around Mauritius. 2. Generate blue carbon credit	Target: 1. Formulation of adequate regulation to be included in the Fisheries and Marine Resources Act. 2. Become an offset partner for external buyers of carbon credits 3. Make Seagrass be accounted for into the national inventory of the UNFCCC Baseline: No baseline for Mauritius. However, few research has already started in the Western Indian Ocean countries.	The coring will be conducted in two phases in parallel with the preliminary survey during the first year and when the seagrass monitoring during the second year. Three sediment cores will be taken for carbon storage analysis. Isotopic analysis of soil carbon to determine stored carbon origin within sediment will also be investigated for the purpose of blue carbon determination. Two sites for each three species (*Thalossodendron ciliatum, Syringodium isoetifolium and Halodule uninervis*), will be selected and three cores will be sampled at each site (3 species, two sites for each 3 species, 3 cores at each site = a total of 18 cores). It is expected that the coring samples will be sent to CSIRO, a research institution in Australia, for the analysis of the core estimate of carbon storage.

Definitions

- **Indicator**: Specific information that provides evidence about the achievement of planned results and activities e.g. percentage of, number of, proportion of, ratio of etc. They can either be quantitative or qualitative.
- **Outcome**: Outcomes are the benefits or other long-term changes that are sought from undertaking the project. They are achieved from the utilisation of the project's outputs. Outcomes are linked with objectives, in that if the outcomes are achieved then the project's objective(s) have been met e.g. reduced pollution, improved management of an ecosystem, enhanced stakeholder engagement etc.
- **Objective**: A project objective is a statement of the overarching rationale for why the project is being conducted. It focuses on what the project is going to achieve, rather than what is produced.
- **Output**: Outputs are those results which are achieved immediately after implementing an activity e.g. meeting reports, management plans, knowledge gained etc.
- **Activities**: Activities are tasks that need to be done to produce the outputs for the project e.g. meetings, trainings, taking transects, etc.

- **Targets**: Targets are the desired level of performance you want to see, as measured by indicators, that represents success at achieving your outcome e.g. number of ha to be restored, population of species to be achieved, pollution levels to be achieved etc.
- **Baseline**: A minimum or starting point used for comparisons determined at the beginning of the project.

Annex 4: Budget (Total budget for the Output applied for MUST NEVER exceed the ceiling given in the background document)

	Category	Quantity	Unit Cost (US$)	Total Cost (US$)	WIOSAP Support	Co-financing
1.	Personnel	6		20 000	Yes	Yes
2.	Equipment	8		150 000	Yes	Yes
3.	Operating costs			10 000	Yes	Yes
4.	Contract Services	2		15 000	Yes	Yes
5.	Travel	2		20 000	Yes	No

Definitions

- **Personnel:** This will be critical personnel required for the successful implementation of the project e.g. a Project Coordinator. Such a role can also be cost-shared with another ongoing project, which has complementary interventions to the proposed WIOSAP project. This category will also include required consultants who may be required for critical technical expertise in the project.
- **Equipment:** This will include a computer, printer, any required office furniture, critical water quality measuring instruments of a reasonable and cost-effective budget etc.
- **Operating costs:** Will include internet, mailing and where very necessary, telephone charges. Will include stationary, fuel and other necessary inputs without a recurring value.
- **Contract services**: Where external services will be required to bring in critical expertise e.g. contractors for construction works etc. This category also includes meetings/workshops e.g. contracted conference package.
- **Travel:** To include ticket costs, local transport and daily subsistence allowance.

Annex 4.1: Budget justification

	Category	Justification
1.	Personnel	To sustain the stakeholders involve in the project to carry out the works
2.	Equipment	To prepare samples for analysis
3.	Operating costs	
4.	Contract Services	To organise workshops for technology transfer and capacity building
5.	Travel	For analysis of sediment samples for blue carbon determination. Technology and equipment not available in Mauritius