

Assessment of Blue Carbon Ecosystem (Seagrass) around the island of Mauritius

Component 3: Sensitisation and Awareness Programme for Students
and Coastal Communities

Report on World Seagrass Day National Campaign 2023

01 March 2023



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1.0 Introduction

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 Canonnières. 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 Canonnières followed by *Thalassodendron ciliatum*, *Halophila ovalis*, *Halodule uninervis*, and small patches of *Halophile stipulacea*. The total seagrass cover at Albion was 20,890 m² over a total surveyed area of 72,000 m² while at Pointe aux Canonnières, the total seagrass cover was 1,252 m² out of 2,500 m² 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.

2.0 AIMS AND OBJECTIVES

2.1 Aim

To carry out educational and sensitisation programme on seagrass around Mauritius Island

2.2 Objectives

- (a) Designing of sensitisation materials
 - (i) Designing of sensitisation materials
 - (ii) Printing of sensitisation materials

(b) Carrying out workshops and sensitisation campaigns for coastal communities and users

(c) Give presentations and educational talks in 8 main coastal schools, fisherman and Coastal communities around Mauritius

(d) Organise a national awareness campaign on protection and conservation of seagrass with NGOs, coastal communities, schools and tourism industry.

3.0 National Awareness campaign on World Seagrass Day

The National campaign and launching of the sensitisation and educational programmes were launched by the Hon. Minister for Blue Economy, Marine Resources, Fisheries & Shipping on 01 March 2023 to commemorate the UN recognised World Seagrass Day at Poste Lafayette (EAST of Mauritius).

Targeted Audience received: 150 people

Institutions	No of representatives
Fishermen	15
Local Community Members	19
Government Local Authorities	11
Enforcement Authorities	18
Schools	70
Universities	4
NGOs	3
Private / Touristic Organisation	10

Photos of the Day (Courtesy of GIS)





Sensitisation Materials

A first batch of 300 sensitisation materials were designed and prepared for the launching which will also be used for the series of sensitisation that will follow in the 4 other designated sites namely Albion (West), Le Morne (South), Mahebourg (East) and Mont Choisy (North). An information signage was also placed near the seagrass protected site for information purposes.

The materials produced and launched on that day are as below:



Flex Banner



Roll Up Banners

Assessment of blue carbon in seagrass ecosystems: A new potential strategy for Mauritius towards climate change mitigation
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 Albion Fisheries Research Centre, Ministry of Blue Economy, Marine Resources, Fisheries & Shipping, Albion, Republic of Mauritius

Introduction
 The Ministry of Blue Economy in Mauritius has started a two years project, with the financial help from the National Convention Secretariat for the WCO-SAP.

Aim
 To determine the carbon sink potential in seagrass meadows around Mauritius in a view to develop strategies and policies gearing towards the generation of blue carbon credit for offsetting.

Methodology

Sampling Area

Species composition and area determination

No	Species Name	% Total Species	Location	Disturbance
1	Halodule wrightii	92.5	Poste La Fayette	High
2	Syringodium isoetifolium	7.5	Albion	Low

Results
 > Organic Carbon Storage Capacity per Ha
 Banc d'Olive > Le Marne > Poste La Fayette > Albion > Mont Choisy
 > All sites had the same species composition for occupation of Albion
 > All sites showed mostly the same capacity for carbon sequestration

Conclusion
 This study brings forth, for the first time, data on the C₂ sequestration potential in seagrass meadows in Mauritius and thus, provides a new avenue towards the development of national management strategies or the creation of nature-based solutions for climate change mitigation.

Acknowledgements
 Technical Support: IRI, UN, GEF, BLUE OCEAN HUB
 Financial Support: UN, GEF, SCAN ME & learn more about the project
 Ministry of Blue Economy, Marine Resources, Fisheries & Shipping

SEAGRASS

An important marine ecosystem

SEAGRASS are flowering marine plants Seagrass has strong linkages with coral reefs and mangroves forming one of the most productive coastal habitats.

Holds more than **40,000 fish** and **50 million small invertebrates**.

Provides **food** and **shelter** to small marine organisms

Capture **10%** more carbon in sediment annually

Protects against beach erosion

Natural filter for pollutants and nutrients

An initiative of the Ministry of Blue Economy, Marine Resources, Fisheries & Shipping

Information Signage

Protecting the sensitive seagrass area at Poste Lafayette

SEAGRASS are flowering marine plants Seagrass has strong linkages with coral reefs and mangroves forming one of the most productive coastal habitats.

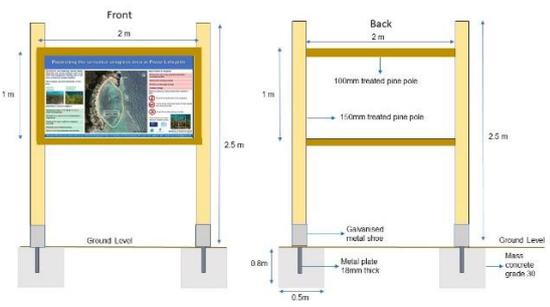
Two seagrass species dominates in this area:
 Halodule wrightii, Syringodium isoetifolium

Importance facts on seagrass
 Holds more than **40,000 fish** & **50 million small invertebrates**.
 Provides **food** and **shelter** to small marine organisms.
 Capture **10%** more carbon in sediment annually.
 Protects against beach erosion
 Natural filter for pollutants and nutrients

Major threats to seagrass
 Destruction caused by preppers and other nautical activities
 Destructive fishing activities
 Pollution and sewage leakage
 Climate Change

Good practices to help protect this sensitive area
 No anchoring directly in the seagrass
 Avoid using motorised boats at high speed and during low tide
 Avoid kite surfing during low tide

Ministry of Blue Economy, Marine Resources, Fisheries & Shipping | Tel: (+230) 211 3470 | Email: blueeconomy@goms.gov.mu



Official National Logo



Media Coverage

A short video on Seagrass available on youtube and projected on Big Screens in Districts Councils and Municipalities around Mauritius. Available at: <https://www.youtube.com/watch?v=ZYE6JEU867Q>

Media Coverage may be obtained on the Ministry's facebook page at https://m.facebook.com/story.php?story_fbid=pfbid02fCmTJ6uZBnrBuw8vFygW6GCGruZf7P5KVVMYWnuS7Rvkyu4Xf8Es2xVqy8L8damol&id=100086495570985&mibextid=Nif5oz and the Government Information System (GIS) facebook page at https://m.facebook.com/story.php?story_fbid=pfbid02FC75MsLaZoM7NG2GwikBdrcdNPYiLB9jmvwPbhUDLpzu4QJuBEaLgP5Yh3xhiBkl&id=100081471432309&mibextid=Nif5oz

The event was also covered by the National Television (MBC) extract available at <https://mcradio.tv/article/le-journal-t%C3%A9l%C3%A9vis%C3%A9-%E2%80%93-mars-01-2023> as from 16:07 to 18:35

Cost used for the National Campaign

SN	ITEMS	QTY	RATE (Rs)	Total Estimate Cost (Rs)
1	Manufacture, Supply and fixing of Display Signage on seagrass at Poste Lafayette Public Beach	1 unit	50 000	50 000
2	Eco-craft bags with Ministry's name, logos & seagrass logo	300 units	325	97 500
3	T-shirt with Ministry name, logo and seagrass logo in front	300	300	150,000
4	Cap (casquette)	300	250	75,000
5	Poster on Seagrass (A1)	500	100	50,000
6	Roll up Banner	4	3,000	12,000
7	Black Back Flex Banner	1	1,200	1,200
8	Lunch Pack	120	250	30,000
9	Veil for Information Board	1	800	800
10	Inox rod	1	250	250
11	Refreshment	1	70,000	70,000
	Total Cost (Rs)			536 750
	Total Cost (USD)			11 457.27

Way Forward

To carry out sensitisation and educational programme and fixing of information signage at 4 more sites: Le Morne, Mahebourg, Albion and Mont Choisy targeting 100 audiences during the months of March to May 2023.

Cost Estimate for the four remaining sensitisation campaigns around Mauritius and attend international conferences

SN	ITEMS	QTY	RATE (Rs)	Total Estimate Cost (Rs)
1	Manufacture, Supply and fixing of Display Signage on seagrass	6 units	50 000	300 000
2	Eco-craft bags with Ministry's name, logos & seagrass logo	500 units	375	187 500
3	T-shirt with Ministry name, logo and seagrass logo in front	500 units	300	150,000
4	Cap (casquette)	500 units	250	100,000
5	Pendrive with information on seagrass to distribute to schools	500 units	500	250,000
6	Roll up Banner	1	3,000	3,000
7	Refreshment	4	70,000	280,000
8	Transportation for students	8	3,000	24,000
9	Venue	4	50, 000	200,000
10	Attend/Present Project to International Conference (Flight + DSA + Registration)	1	250, 000	250, 000
Gross Cost (Rs)				1,744,500
Contingencies (15%) (Rs)				261,675
Total Cost (Rs)				2,006,175
Total Cost (USD)				42,823.1

REQUEST TO WIOSAP / NAIROBI CONVENTION

Request (1): To reallocate 43,000 USD from 88,520 USD from Component 1 (Island-wide assessment and continuous monitoring of the seagrass diversity and distribution) to Component 3 (Sensitisation and Awareness Programme for Students and Coastal Communities).

Request (2): To receive the last part of the allocated funds (90,150 USD). 100,000 USD was received as first transfer only.

Justification: Component 1 is almost completed and has been using the Government money for 1 year as there was delay in receiving the first WIOSAP funds to start the project.