

Economic valuation of the marine and coastal biodiversity for Palm Islands Nature Reserve in Lebanon

An overview of the study

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The content of this brochure was developed by ECODIT Liban SARL as part of the project “Market policy and legislative development for mainstreaming sustainable management of marine and coastal ecosystems in Lebanon”. The project is executed by the International Union for Conservation of Nature – Regional Office for West Asia (IUCN-ROWA) in partnership with the Lebanese Ministry of Environment and funded by the Global Environment Facility (GEF) through the United Nations Environment Programme (UNEP).

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Project Background and Objectives

The International Union for Conservation of Nature – Regional Office for West Asia (IUCN–ROWA) in collaboration with the Lebanese Ministry of Environment (MoE) is executing the project “Market Policy and Legislative Development for Mainstreaming Sustainable Management of Marine and Coastal Ecosystems in Lebanon”. The project, which is funded by the Global Environment Facility (GEF) and implemented by the United Nations Environment Programme (UNEP), aims at creating an enabling integrated framework for sustainable management and conservation of coastal and marine biodiversity and at mainstreaming the priorities of this biodiversity into national plans, and coastal zone management plans, with particular focus on the impact of climate change on marine and coastal biodiversity.

ECODIT Liban SARL was assigned by IUCN-ROWA to deliver a comprehensive *Ecosystem Services Valuation for the Palm Island Nature Reserve (PINR)*.

Objectives

This study is an *economic valuation* intended to *translate the benefits* provided by the marine and coastal ecosystem services of Palm Islands Nature Reserve (PINR) *into monetary terms*.

It will stress on the socio-economic importance of this Marine Protected Area (MPA) and provide decision-makers with the necessary tools to efficiently monitor and



Ramkine Island
© Ghassan Ramadan-Jaradi

protect the marine and coastal ecosystems; leading to an *optimal balance between ecosystem services use and conservation*.

The ultimate purpose is to *enhance management practices*, leading to *more resilient ecosystems*, effective conservation of marine biodiversity, and *improved climate change adaptation and mitigation mechanisms*, as well as to *strengthen local livelihoods and provide food security*.

Marine Protected Areas and Ecosystem Services

Marine protected areas (MPAs) are described by the International Union for Conservation of Nature (IUCN) as: “clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.”

MPAs were established to efficiently manage and protect vital marine and coastal ecosystems, processes, habitats and species; which can contribute to the restoration and replenishment of resources for social, economic and cultural enrichment.

MPAs have numerous benefits, including:

-  Increasing fish stocks
-  Protecting of species and restoring ecosystem diversity
-  Adjusting to climate change impacts and carbon storage
-  Creating sustainable tourism
-  Conserving cultural heritage
-  Supporting improved governance
-  Enhancing ecosystem resilience



Ecological benefits

Biodiversity conservation (e.g. fish stock, species habitats etc.); preservation of ecosystems regulatory services (e.g. climate regulation, coastal protection etc.).

Economic benefits

Improve business opportunities which generate revenues, turnovers and profits (e.g. eco-touristic activities) and increase employment rate.

Social benefits

Positively impact local communities by creating jobs (e.g. boat operators, guided tours etc.). They also provide cultural, educational and research opportunities.



Biodiversity in PINR
© Ghassan Ramadan-Jaradi

About Palm Islands Nature Reserve



Palm Islands Nature Reserve (PINR) is a marine protected area located approximately 5.5 km northwest of Tripoli, Lebanon. It comprises three flat, uninhabited Mediterranean islands with 500 meters of surrounding sea. The islands are: Sanani, Ramkine and Palm Island (largest of the three islands, also known as Rabbits Island).

Satellite Image of PINR

© Google Maps



Declaration

Under the mandate of MoE

March 09, 1992

Law no.121



International designation

Important Bird Area (IBA) in 1994

Ramsar Wetland of Special International Importance - 2001

Specially Protected Area of Mediterranean Importance (SPAMI) - 2012



Zones

Recreational zone

Turtle Breeding zone

Research area

Strictly protected zone (Seabird Breeding Area)



Ecosystems

Sand dunes

Sandy beach

Mixed loamy soil including vegetation

Earthen rocks

Marine seawater



Special species

Loggerhead and green sea turtles

Monk seals

Migratory birds

Special culinary and medicinal flora



Cultural heritage

Old salt pans

Old crusader church ruins and carved channels

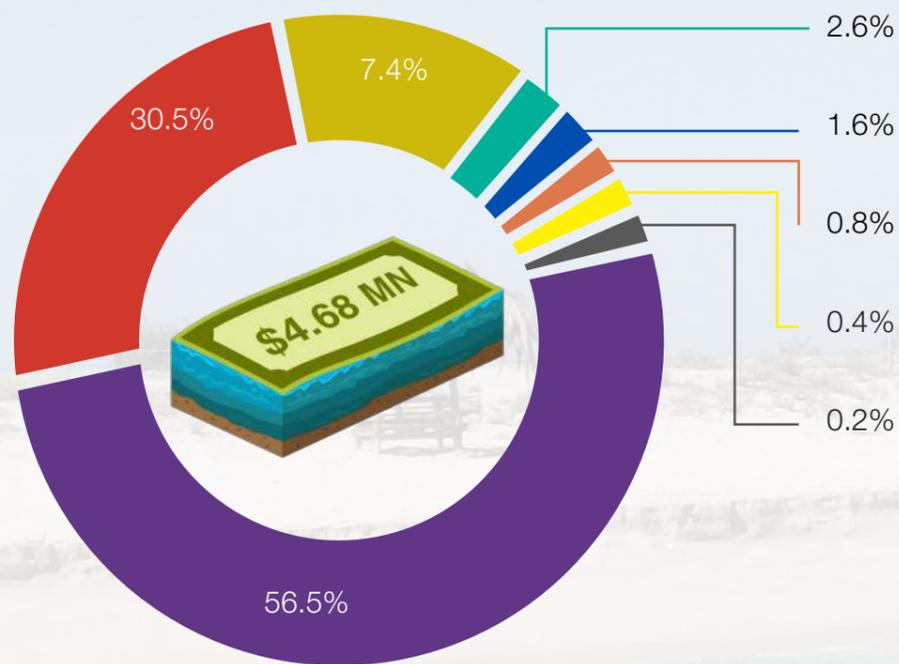
Old lighthouse and associated cannon mount site

Estimated Economic Values of PINR Ecosystem Services



Ecosystems Benefits and Results

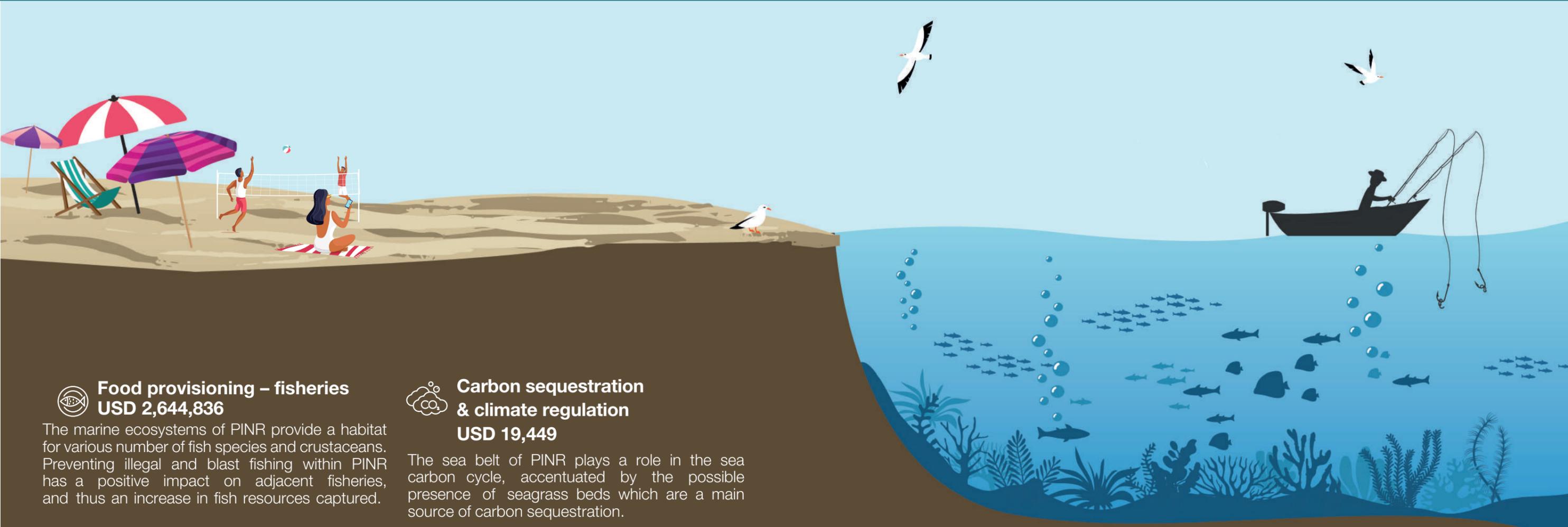
Total yearly estimated economic benefits of PINR marine and coastal ecosystems:
USD 4.68 Million



- Bequest value
- Fisheries
- Recreation & ecotourism
- Coastal protection & hazard mitigation
- Education & research
- Biodiversity & biological support
- Carbon sequestration & climate regulation
- Medicinal, culinary & ornamental products

The total economic valuation figures provide an estimated overview of the total social welfare and ecological benefits derived from the MPAs. It is important to note that ecosystems function in a dynamic way and their provision of services may vary across time. Placing a monetary value in ecosystem services does not mean that these services can be traded or marketed.

Estimated Economic Values of PINR Ecosystem Services



Food provisioning – fisheries USD 2,644,836

The marine ecosystems of PINR provide a habitat for various number of fish species and crustaceans. Preventing illegal and blast fishing within PINR has a positive impact on adjacent fisheries, and thus an increase in fish resources captured.



Carbon sequestration & climate regulation USD 19,449

The sea belt of PINR plays a role in the sea carbon cycle, accentuated by the possible presence of seagrass beds which are a main source of carbon sequestration.



Recreation & ecotourism USD 1,428,671

Around 20,000 to 22,000 visitors visit the reserve annually for nature-based recreational and eco-tourism activities (swimming, sun-bathing, snorkeling, scuba-diving, wildlife watching etc.). The eco-touristic activities in PINR create a dynamic flow of revenues in the area. Promenade ferries operators, local shops, lodgment facilities, water sports suppliers and other service providers benefit in a direct and indirect way from the reserve.



Cultural & archaeological heritage

The location and topography of the Islands made them a strategic place for the Phoenicians and, later the French to utilize and build infrastructure on the islands (e.g. the old lighthouse and mount cannons on Ramkine and the old crusader church on Palm Island). These cultural and archaeological sites in PINR have a major role in educating local communities and visitors about the culture, history and heritage of the protected area.



Coastal protection & hazard mitigation USD 123,042

Regulating services of PINR includes: shoreline stabilisation, erosion control, storm protection and wave attenuation. For example: sand dunes and sandy beach serve as natural barriers against severe weather conditions and storms waves that can cause damage to the coastline and loss of habitats.



Bequest value USD 74,362

This value is intangible, categorised as non-use marine and coastal ecosystem benefit. It measures the desire of people to conserve PINR ecosystems and their services for the future. This value is estimated using the results of the survey conducted for PINR.



Biodiversity & biological support USD 348,553

The location of PINR and its different habitats present favourable habitats, refuge and breeding grounds for endangered marine and coastal species (e.g. monk seals, green turtles etc.), as well as resting sites for migratory birds.



Raw materials - freshwater

- Freshwater supplied by the well on Palm Island.
- Remains of old salt pans on Palm Island have the potential to produce high-quality iodised sea salt. The latter can be extracted and sold to tourists as a symbolic organic product of the reserve.



Education & research USD 36,200

Marine and coastal ecosystems of PINR are very attractive grounds for many scientists and researchers as they enclose a wide variety of habitats and healthy ecosystems.



Medicinal, culinary & ornamental products USD 8,392

Some plants of the uninhabited PINR are recognized for their culinary and medicinal uses.

Main Recommendations – Way Forward



1 Conservation and protection of the marine and coastal ecosystems in the MPA is fundamental to ensure sustainable flow of goods and services that are important for the society's welfare.



2 Abiding by the rules and regulations imposed by the MPA limits the degradation of ecosystems and biodiversity in the reserve.



3 Understanding the link between the MPA's ecosystems functioning and the flow of benefits generated in both direct and indirect way is a vital first step to conservation.



4 Having healthy ecosystems will allow for more climate change resilience.



5 Protecting marine and coastal ecosystems will guarantee sustainability by allowing future generations to benefit from these natural services.



6 Polluters must be aware that legal and financial sanctions are imposed in case of any actions that would harm the environment and species.



7 Local community and the society must share the responsibility of managing and protecting the reserve as they are considered one of the first beneficiaries. For example, stopping illegal fishing and blast fishing within the reserve will result in the conservation of fishery stock and marine species in adjacent areas.



8 Shedding lights on the importance of a MPA ultimately allows for surrounding businesses to thrive as the number of visitors would surge as an effect of national recognition.



9 The protection of a MPA secures a higher priority ranking in terms of national and international funds that will be reflected back in the economy and wellbeing of the region.



Way forward

Local community and the society must share the responsibility of managing and protecting the reserve, which will ensure sustainable flow of goods and services and protection of biodiversity.

Keeping MPAs protected and clean constitutes a passive financial income for the surrounding areas and municipal institutions as well as an aesthetically pleasant environment for local community and tourists.



Yellow-legged gulls in PINR

© Ghassan Ramadan Jaradi

1 Nature, in specific marine and coastal habitats, are amongst the most productive and vital ecosystems. They provide various ecological and socio-economic benefits; yet they are under many environmental and anthropogenic threats leading to their deterioration.

The benefits offered by the marine and coastal ecosystems are categorised by the Millennium Ecosystem Assessment in 2005 as provisioning (e.g. food and materials), regulating (e.g. carbon sequestration, erosion control etc.), cultural (e.g. recreation, eco-tourism, educational) and supporting (e.g. nutrient cycling and primary production).

Increasing population and human needs coupled by the impacts of climate change are increasing the pressure on these ecosystems leading to their degradation.

2 The ecosystems of the Mediterranean Sea have been degrading rapidly, jeopardising the local economies and livelihoods of the society depending on the sea.

Ocean-related activities in the Mediterranean Sea generate an annual economic value of USD 450 billion making it the fifth largest economy in the region.

3 UN Convention on Biological Diversity (CBD) aims to preserve at least 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services.

Initiative to alleviate the marine and coastal degradation and to protect these ecosystems in order to maintain the flow of goods and services they produce.

4 MPAs are established to efficiently manage and protect vital marine and coastal ecosystems, processes, habitats and species.

This contributes to the restoration and replenishment of resources for social, economic and cultural enrichment.

5 Social engagement and local consensus must not be neglected when conserving the nature.

Social, cultural and economic impacts have to be well established and explained to the local communities and society in order to avoid any hostile behaviour or opposition.

6 Majority of the MPAs ecosystem services are under-estimated or overlooked due to their indirect long-term benefits to the society

Some of the benefits provided by the regulating services of ecosystems are not explicitly captured by society (e.g. the carbon sequestration whose effect is transboundary, the spill-over effect of fisheries and marine species to adjacent areas, etc.)



7 As established by The Economics of Ecosystems and Biodiversity program (TEEB) and Millennium Ecosystem Assessment (MA): “MPAs benefits calculated are significantly higher than estimated costs”.

The costs of MPAs are directly related to establishment, maintenance and compliance actions. Yet, each investment in conservation yields higher benefits from ecosystem services.

8 Fisheries and eco-tourism sectors are the main contributors to the Mediterranean Economy, and they are considered key ecosystem services of marine protected areas.

The fishery sector has a total worth of USD 3 billion based on the General Fisheries Commission for the Mediterranean (GFCM) in 2016. As for the recreational and subsistence fishing it generated around USD 200 million. However, overfishing activities have put 80% of the fish stock under threat.

As for the eco-tourism sector, it is generating more than USD 420 billion yearly to the regional economy. Yet, when not well managed and controlled, this sector is resulting in the degradation of many marine and coastal ecosystems.

Glossary

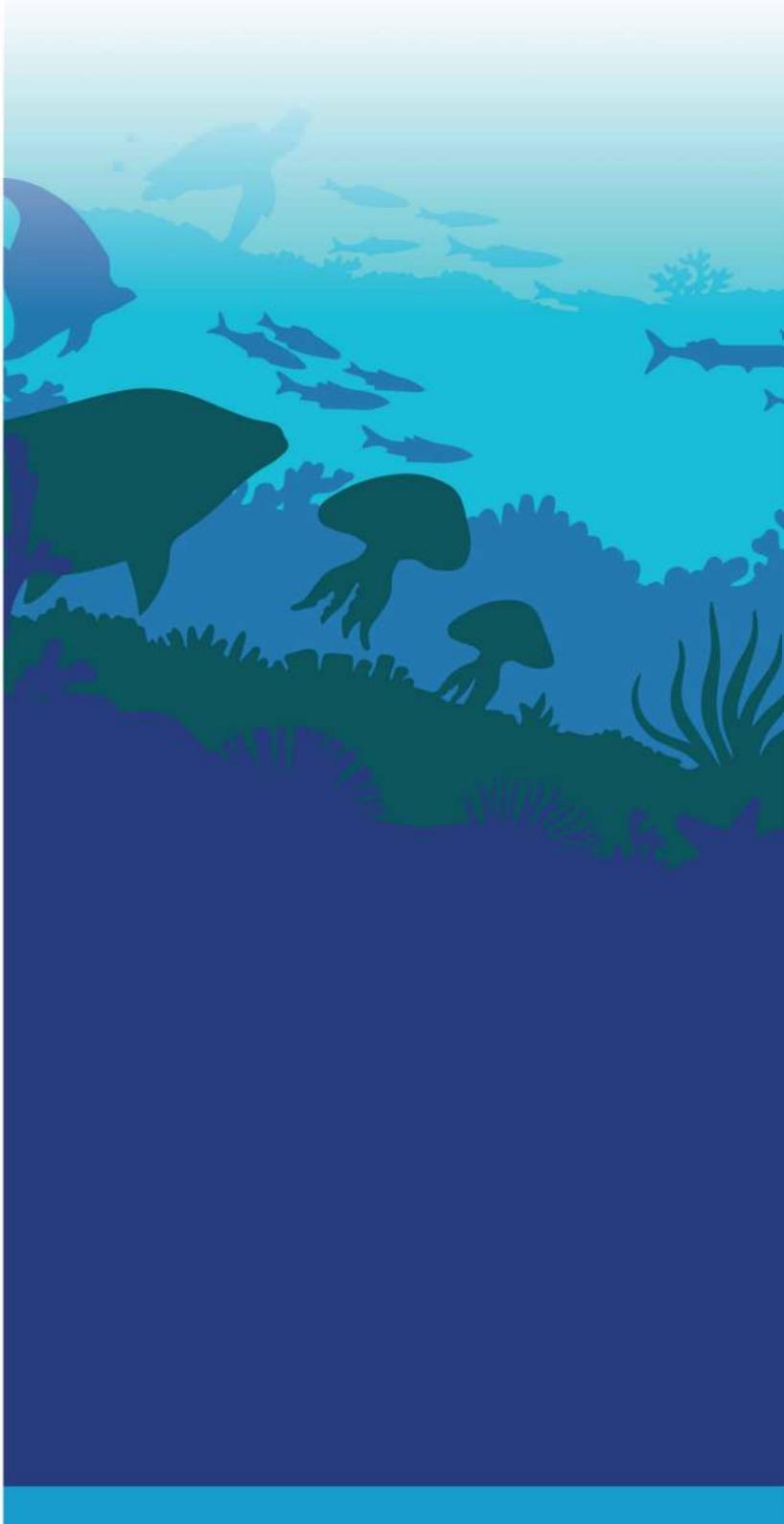
Ecosystems: defined as the interaction between living and non-living organisms that live and function together in a particular habitat to provide a flow of ecosystem services (Willis, 1997).

Ecosystem Services: pioneered by the Millennium Ecosystem Assessment (MA) (Alcamo, et al., 2003) and The Economics of Ecosystems and Biodiversity (TEEB) program (Wittmer, et al., 2013), it highlights the importance of human dependency on ecosystem services and underlines the functioning of ecosystems with the role of biodiversity and ecological processes on human well-being.

Carbon Sequestration: Carbon sequestration is a biochemical process by which atmospheric carbon is absorbed by living organisms, including trees, soil microorganisms, and crops, and involving the storage of carbon in soils, with the potential to reduce atmospheric carbon dioxide levels.

Wetlands: Transitional areas between terrestrial and aquatic systems in which the water table is usually at or near the surface or the land is covered by shallow water.





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