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STRENGTHENING THE STEWARDSHIP OF AN ECONOMICALLY AND
BIOLOGICALLY SIGNIFICANT HIGH SEAS AREA – THE SARGASSO SEA

PROPOSED STRUCTURE FOR THE SOCIO-
ECONOMIC DIAGNOSTIC ANALYSIS

Chapter 1: Introduction to the Socio-Ecosystem Diagnostic Analysis - Background & History

- A. The Geopolitical Context and Overview of Importance of the Sargasso Sea
- B. Brief Explanation of the SEDA Development Process – Objectives and Activities
- C. Defining the Management/System Boundary taking into account the ecological, biochemical, physical, economic, regulatory, institutional, sociological aspects.
- D. Overview of current data collection programmes and ongoing monitoring of the ecosystem and its biodiversity

Chapter 2: Socio- Ecosystem Analysis Baseline

Baseline Environmental Status - Current status regarding oceanography, productivity, fisheries, biodiversity, pollution, etc.

Baseline Socioeconomic Status - focusing particularly on Industry and Livelihoods (fisheries, tourism, energy, mining, shipping, etc.)

Baseline Management, Policy and Governance Status - the status quo on management and decision-making mandates and bodies that already exists (e.g. NAFO, ICCAT, IMO MEPC) including linkages into existing treaties

Summary of Threats and Impacts

Connectivity Considerations

- A. Links between environmental impacts and socioeconomics, and
- B. Connectivity within the system boundary and across the system boundary

Cross-cutting issues - gender mainstreaming, poverty reduction, employment practices

Chapter 3: Ecosystem Valuation

The objective within this chapter is to arrive at an estimate of the value of ecosystem services within the Sargasso Sea in monetary units

The realization of the monetary value may be far distant from the actual system boundary of the Sargasso Sea itself (e.g. anguillid fisheries and exports)

This is essential information for advocacy as well as for public awareness and can also inform the prioritisation of the threats and their impacts

The results and conclusions from this Chapter will be of significant importance in justifying the stewardship and management measures proposed within the SAP

There is valuable existing information already on this topic e.g. Nicholas Institute Report - 'Assessing the Economic Contribution of Marine and Coastal Ecosystem Services in the Sargasso Sea'.

Chapter 4: Cost-Benefit Analysis for Improved Stewardship

Demonstrating the value of a potentially more efficient collaborative stewardship approach

Aims to justify the need for an effective Strategic Action Programme by examining the costs of both action and inaction

Where appropriate, include options for such an approach. N.B. This section is 'exploratory' rather than aiming to be definitive. The Strategic Action Programme negotiations will consider the options in more detail

May include some initial 'thoughts' on sustainability of any monitoring, management and/or stewardship process (who, how, how much in \$\$\$)

Chapter 5: Proposed Socio-Ecosystem Quality Objectives

Identifies how the various partners/stakeholders see the expectations for maintaining or even improving the quality of the Ecosystem and the dependent socio-economic linkages

These are 'proposed' SEQOs and would need to be discussed and approved as part of the development and adoption of the SAP

As an example, a SEQO might be the reduction in the number of collisions between shipping and vulnerable species OR an improvement in a particular water quality parameter / reduction in a level of pollutant

These would then represent the priority objectives for the SAP and would also then be priorities under any monitoring programme

Chapter 6: Monitoring and Indicators

Ongoing measurements of those parameters addressed in the Baseline Environmental and Socio-Economic Sections above should be captured within a Monitoring Programme that would form part of the SAP agreement

GEF also places particular importance on three types of Indicators that demonstrate improvements in the welfare of the ecosystem:

Process Indicators: e.g. negotiation and adoption of new legislation to control and mitigate pollution from shipping or other maritime activities (signed treaties/agreement/protocols)

Stress Reduction Indicators: e.g. actual physical control measures in place such as filtration or storage systems for waste products and pollutants

Environmental Indicators: e.g. a measurable improvement in water quality, particularly in relation to the particular form of pollutant and its harmful presence

This section should, where feasible, identify scheduling and potential responsibility for the monitoring

Chapter 7: Potential Marine Spatial Planning approaches and other Area-Based Management Tools

Based on an initial overview of the spatial and temporal distribution of human activities within the Sargasso Sea (as well as any externalities)

Aim to balance the need to maintain the various ecological, economic and social status quo in a manner that, where possible, supports the wellbeing of each and all

This section is meant to identify the possibilities and potential ABMTs that could be employed for consideration in the development of the SAP.

In view of the 'innovative' nature of this exercise within an ABNJ, it may be valuable to consider new tools and new approaches to MSP.

Chapter 8: Linkages to the Sustainable Development Goals

This would be a relatively short section/chapter that identifies how the stewardship approach being developed within the Sargasso Sea would help to support and deliver on the UN Sustainable Development Goals

This can then form part of the justification for more effective stewardship within the SAP, possibly along with other relevant indicators and targets such as the Aichi targets as set by the Convention on Biological Diversity

Chapter 9: Final Justification for the proposed System Management Area/Boundary

Based on the information collected and analysed as part of this SEDA, consider the question - is the original 'System Boundary' (i.e. the Sargasso Sea Geographical Area of Collaboration) still appropriate for effective stewardship through a SAP?

In the absence of clear and permanent boundaries (e.g. of a geopolitical nature such as is used for many LMEs) there needs to be careful consideration of other external effects and impacts to avoid treating this as an isolated system

Chapter 10: The Socio-Ecosystem Analysis – Knowledge Gaps

- A. Bibliography of available Information
- B. Identification of Knowledge Gaps and possible sources



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The DPSIR and the Socio-Ecosystem Diagnostic Analysis

Relationship between DPSIR and SEDA

From the DPSIR Process	In the SEDA document
State, Impact	Environmental and Socioeconomic status of the Sargasso Sea. This forms the main bulk of the SEDA and provides current knowledge on the ecosystem status and trends. This data/analysis is then used to 'rank' the priority threats to the ecosystem based on an understanding and agreement of the environmental degradation and socioeconomic value/loss
Drivers	Defined as 'Root Causes' in the Causal Chain Analysis (e.g. ineffective management, inadequate capacity, weak policy, etc.)
Pressures	Defined as Immediate Causes in the Causal Chain Analysis (e.g. over-fishing, pollutant inputs)
Responses	Proposed Policy and Institutional Reforms, investments to address (remove or mitigate) main drivers and impacts. These would be both at 'root' (governance, policy) and to remove more immediate concerns at the level of 'Causes' through investments. These would provide 'logical' propositions for action within the separate Strategic Action Programme to follow this SEDA approach



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Expected Inputs to the Sargasso Sea Socio-Ecosystem Diagnostic Analysis

Expected Inputs from Various Partners to the SEDA process

It would be very useful now to go through the 'expected' inputs to the various SEDA Sections for the Sargasso Sea

Please Note; These 'expected' inputs are purely my interpretation based on the various agreements, contract and reports so far. It would be very helpful if you could confirm these or otherwise

(and my apologies for any errors or misinterpretations!!)

Duke MGEL

Sargasso Sea Descriptive - Oceanography and Ecosystem	
Past Work & Study Region	
Currents & Eddies	
Surface Topography	
Salinity, Temperature, Thermocline	
Chlorophyll Concentration	
Pelagic Habitats	
Ecosystem Classes, Mapping and Sub-Regions	
Tracking and Distribution of Sargassum Mats	
Current Ecosystem State	
Human Pressures	
Migratory Corridors	
Biodiversity indices (richness, diversity),	
Fisheries Catches, Bycatch	
Maritime Traffic and Activities (inc. Seabed mining)	
Marine Pollution and Debris	
Human Pressures (generally)	
Possible Governance and Management Improvements	
Existing data gaps, areas for future research and possible new analyses	

Bibliography of environmental, fisheries, and biological data	
Risk analysis based on elicitation to identify main concerns of stakeholders	
Updated Meta-database	
Update of the DPSIR and validation procedures	
COVERAGE Case Study specifications	

Bermuda Institute of Ocean Sciences

Physical characteristics of the oceanography of the Sargasso Sea

Meteorology and seasonality of the upper ocean	
Decadal changes in temperature and salinity of the upper ocean, and influence of modes of climate variability	
Properties of and changes in intermediate depth waters in the Sargasso Sea including subtropical mode water (STMW)	
Mesoscale eddy features and influence on Sargasso Sea variability	
Physical characteristics and changes in the deep water of the Sargasso Sea	

Chemical oceanography of the Sargasso Sea

Nutrients in the Sargasso Sea – seasonality and decade changes	
Dissolved oxygen seasonality and deoxygenation in the Sargasso Sea	
Trace element cycling in the Sargasso Sea	
Organic contaminants in the Sargasso Sea	
Microplastic contaminants in Sargasso Sea	

Biological oceanography of the Sargasso Sea

Food web overview including ocean optics and remote sensing

Microbial ecology, genomics and eDNA

Phytoplankton diversity and productivity

Zooplankton ecology

Export of organic matter in the Sargasso Sea

Decadal changes in the Sargasso Sea

Bermuda Institute of Ocean Sciences

Biogeochemical cycles and air-sea interactions in the Sargasso Sea	
Marine biogeochemical cycles in the Sargasso Sea	
The marine carbon cycle and ocean acidification	
Calcium carbonate production	
Air-sea gas exchange in the Sargasso Sea including carbon dioxide and DMS	
Atmospheric deposition and acid precipitation	
Influence of climate variability on the Sargasso Sea	

Biogeochemical cycles and onshore-offshore interactions between the coral reefs of Bermuda and the surrounding Sargasso Sea	
Marine biogeochemical cycles in the coral reef system	
Interaction and exchanges with the surrounding Sargasso Sea	

Edinburgh University

Using ATLAS to provide information on Deep Sea Ecosystems and associated species

Predicting future changes to ecosystems and species together with their vulnerabilities in the face of climate change

Using the multidisciplinary research programme of iAtlantic to assess the health of deep-sea and open-ocean ecosystems and to determine the resilience of deep-sea animals and associated habitats to threats such as temperature rise, pollution and human activities.

Employ deep-ocean observing capacities to provide accurate and detailed insights into ocean circulation in the past, present and future at a range of spatial and temporal scales using the latest marine robotics and imaging technology.

Identify the impacts of climate change on the ecosystem, allowing the identification of key drivers of ecosystem change and determine which areas of the Atlantic Ocean, including the Sargasso Sea, are most vulnerable to the effects of sustained, increasing and multiple pressures.

International Maritime University

Data capture to analyse ecological sensitivity of Sargasso Sea and environmental impacts from shipping including from abandoned, discarded or otherwise lost fishing gear and the need for improved marking and tracking of such	
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International Cable Protection Committee

Potential use of cables as sensors to detect change in the immediate environment alongside the cable	
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Various Fisheries-Related Partners

Western Central Atlantic Fisheries Commission	Information related to the conservation, management and development of the living marine resources of the area of competence of the Commission	
Global Fishing Watch	Working closely with MGEL and using state-of-the-art technology to visualise, monitor and share data on fishing activities, shipping, historical and real-time, seasonal or annual practices and ocean use. The data will be interpreted after an analysis that will be developed with the MGEL team as part of the Project on both sites.	
International Commission for the Conservation of Atlantic Tunas	Provide necessary data to support a case study to help develop Ecosystem Based Fisheries Management in the ICCAT Area including the Sargasso Sea	
North Atlantic Fisheries Organization	The status of the seamounts and associated fisheries with a view to identifying environmentally sensitive deep-sea areas	



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