



**Integrated Sargassum Management  
(4 years / US\$10,000,000.0)**

Dominican Republic

**Project/Program Concept Paper**

Ver2.

26, 09, 2023

<i>Applicant Information</i>	
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**PROJECT/PROGRAM CONCEPT PAPER (PCP)**  
(Version for Bilateral Project)

<b>SECTION 1. BASIC PROJECT INFORMATION</b>		
<b>1.1</b>	<b>Country</b>	Dominican Republic
<b>1.2</b>	<b>Title</b>	Integrated Sargassum Management
<b>1.3</b>	<b>Location(s)</b>	Dominican Republic's marine coastal area
<b>1.4</b>	<b>Duration</b>	4 years (2025-20 26)
<b>1.5</b>	<b>Budget (total)</b>	<i>Contribution from KOICA: USD 10,000,000.0 million</i> (20**): USD XX, 20**): USD XX, 20**): USD XX) Organization's co-funding: (Funds) USD XX, (in-kind) USD
<b>1.6</b>	<b>Objectives</b>	<p>1. Develop an integrated sargassum management plan that includes prevention, cleanup, and final disposal measures.</p> <p>2. Strengthen the capacity of local communities to manage sargassum in a sustainable manner.</p> <p>3. Promote research, monitoring and early warning of sargassum to improve the understanding of its impact in the Dominican Republic and the rest of the Caribbean.</p>
<b>1.7</b>	<b>Beneficiary</b>	<p><b>Direct Beneficiaries:</b> <b>Local coastal communities:</b></p> <ul style="list-style-type: none"> <li>- Approximately 10,000 residents of communities that depend significantly on tourism and fishing.</li> <li>-</li> </ul> <p><b>Government entities and local organizations:</b> Approximately 20 municipal authorities and 10 nongovernmental organizations involved in sargassum management</p> <p><b>Indirect beneficiaries:</b></p> <p><b>Visitors and Tourists:</b></p>

		<ul style="list-style-type: none"> <li>- An estimated 1,000,000 tourists per year will visit the improved and less affected areas by sargassum in the Dominican Republic.</li> </ul> <p><b>Fisheries Sector:</b></p> <ul style="list-style-type: none"> <li>- Nearly 5,000 fishermen and workers in fishing enterprises who will benefit from healthier marine ecosystems.</li> </ul> <p><b>Local and National Economy:</b></p> <ul style="list-style-type: none"> <li>- 50 small and medium enterprises in the tourism, industry and fishing sectors that will adopt circular economy practices, such as recycling sargassum for commercial products and reusing resources.</li> </ul> <p><b>Beneficiaries Sensitized and Trained: Educators and Community Leaders:</b></p> <ul style="list-style-type: none"> <li>- At least 200 people who will receive specific training in sustainable sargassum management and circular economy.</li> </ul> <p><b>General Public:</b></p> <ul style="list-style-type: none"> <li>- Estimated 50,000 people sensitized through public awareness and education campaigns.</li> </ul>
1.8	<b>Implementing organization</b>	<i>Ministry of Environment and Natural Resources</i>

## SECTION 2. PROJECT RATIONALE

2.1	<p><b>SITUATION ANALYSIS:</b> Please provide a brief introduction to the current social and economic situation related to the Project (geographic region and beneficiaries, etc.)</p> <p>Please describe problems/critical issues that the Project seeks to resolve, while identifying their root causes. Include also how this Project would address the problems/critical issues identified.</p> <p>If possible, include the gender equality analysis in this section.</p>
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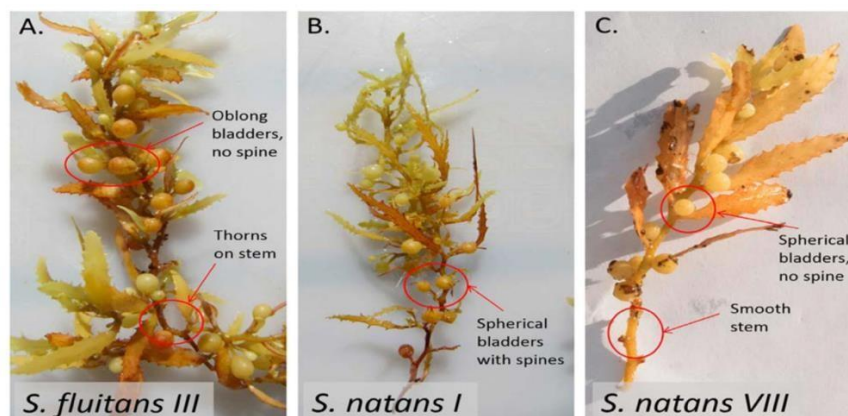
Since 2011, the Caribbean coasts have been subject to episodic, massive and unprecedented influxes of floating sargassum algae. Although 2020 was relatively mild in terms of sargassum volumes, and a global pandemic became the predominant concern, 2018 broke records in terms of sargassum volumes reaching the coasts of Caribbean countries and northern South America. Floating sargassum should not be interpreted as negative in itself: it is beneficial in the sea, primarily as a unique pelagic habitat. However, the mass stranding of sargassum on coasts has significant negative impacts (biophysical and socioeconomic), particularly on coastal communities and livelihoods, public health, tourism and fisheries. Therefore, this problem represents an emerging hazard for a region that is already subject to numerous threats. In fact, several Caribbean countries have declared national states of emergency with respect to sargassum influxes (Desrochers et al. 2020).



Figure 1- Schematic illustrating new sargassum source region

The Wider Caribbean Region (WCR) is geopolitically diverse and complex (Mahon et al. 2013, Debels et al. 2017); in fact, it is the most diverse and complex among the Regional Seas Programs. There are numerous political entities, vast differences in size, and varied levels of development (Debels et al. 2017). The region contains small island developing states (SIDS), with the well-known challenges associated with sustainable development: the WCR contains the largest number of SIDS of any region globally, and the largest number in the Regional Seas Programs. While there are many similarities and valid generalizations, the region is less homogeneous and more variable than it appears. This has implications both for how sargassum impacts countries and territories in the region, and for the appropriateness of responses, given the numerous ways of categorizing countries and territories in this complex region.

Caribbean upwelling has been found to consist predominantly of two species of holopelagic sargassum: *S. natans* and *S. fluitans*. There are several morphotypes of these species and some debate as to whether there may be a third (Desrochers et al. 2020).



Source: DOI: 10.7717/peerj.7814/fig-1

Figure 2: Morphological differences between pelagic *Sargassum* species and/or morphotypes (Govindarajan et al. 2019).

The sargassum that reaches the Dominican coasts belongs to a species that can accumulate extensive floating masses on the sea's surface (plankton composed of organisms that spend their lives fluctuating). This type of algae belongs to the genus *Sargassum* and includes species of macroalgae of the class Phaeophyceae (brown algae), which includes more than 300 species, both benthic and holopelagic (Guiry & Guiry, 2019). The latter are the ones found in the Dominican Republic.

*Sargassum* algae line up in "kelp lines" across the surface ocean circulation, creating a unique offshore habitat that hosts a highly diverse and productive community. This habitat supports turtles, birds, invertebrates and fish, many endemic to the sargassum ecosystem. It also supports abundant schools of pelagic fish, which serve as food for top predators such as mahi mahi, tuna, mackerel and billfish.



Figure 3: The CLME+Project

### Critical Problems/Issues

According to the Inter-American Development Bank (IDB), in 2018 sargassum cleanup cost the Caribbean around \$120 million. Considering the socioeconomic consequences, the impacts of excess sargassum on tourism, coastal communities and ecosystems are substantial, tourism-dependent regions may experience negative effects such as beach erosion, unpleasant odors, and disruption of recreational activities. Coastal communities that depend on fishing may face challenges as sargassum interferes with fishing activities and damages fishing equipment.

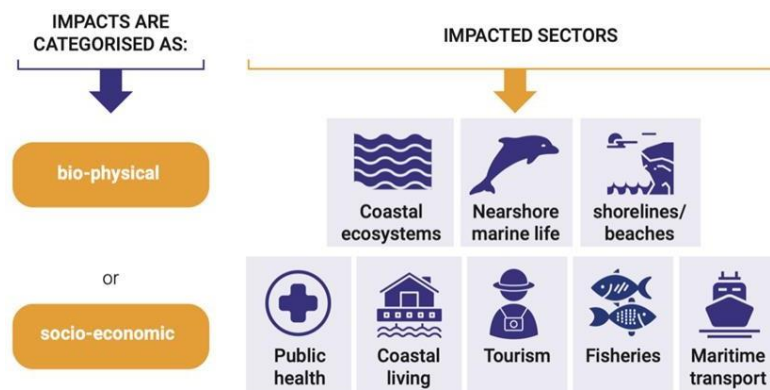


Figure 4: SGWP21.pdf (unep.org)

In addition, sargassum influxes can have ecological repercussions, such as smothering and shading coral reefs, seagrass beds, and other coastal habitats. These impacts can alter marine ecosystems, affecting biodiversity and ecosystem services.

## Soluciones Propuestas

This 4-year, \$10,000,000 project seeks to mitigate the impacts of sargassum through a comprehensive approach:

- **Sustainable Sargassum Management:** Use modified machinery to transform sargassum biomass into smaller particles, which could be reused in various sustainable applications, such as fertilizers or biofuels.
- **Strengthening Local Communities:** Train some 30,000 people in coastal communities and more than 3,000 MSMEs in circular economy practices, such as sargassum recycling and resource reuse.
- **Research Promotion:** Promote research to better understand the causes and impacts of sargassum, and establish a monitoring and early warning system.

### Gender Equality Analysis:

The impact of sargassum can be disproportionate for women, especially those employed in tourism and fishing, where they represent 65% (World Tourism Organization) and 9% (I National Fisheries Census), respectively. The project emphasizes gender inclusion, training primarily youth and women in sustainable sargassum management and circular economy practices.

### Project Focus:

The project focuses on the sustainable management of sargassum, aligned with the objectives of biodiversity conservation and minimization of the negative impacts of this macroalgae. Modified machinery will be used to transform the biomass into smaller particles, allowing it to be repurposed into various sustainable applications. This approach not only mitigates ecological impacts, but also offers sustainable economic opportunities.

By addressing these issues comprehensively, the project has the potential to benefit the entire Dominican Republic, alleviating negative impacts and creating alternative economic opportunities in other locations.

2.2

**COUNTRY DEVELOPMENT STRATEGIES AND POLICIES:** Please describe how the Project relates to partner country's national development priorities, strategies and short, mid to long-term plans. If possible, provide the ongoing status of their implementation, results and effects. Also, please analyze whether this Project relates to KOICA Mid-term Sectoral Strategy (refer to Annex 1).

Please indicate if there are relevant legal system (laws and regulations related to the scope of project) and technical and operational capacity in place to implement the project in the partner country.

## **Country Development Strategies and Policies**

### **Relationship to National Development Priorities**

The integrated sargassum management project in the Dominican Republic is directly aligned with the national priorities of sustainable development, environmental protection, and strengthening the economy. The massive accumulation of sargassum on the country's coasts has a significant impact on the economy, especially on tourism and fisheries, which are key sectors. In addition, the project seeks to address environmental and social challenges, such as marine ecosystem degradation and gender inclusion in coastal communities.

### **Implementation Status, Results and Effects**

This project is requesting funding to establish an integrated management system for sargassum in the Dominican Republic. The objective of this plan is to reduce its negative impacts, contemplating a series of management measures that address different aspects of the problem, the improvement of coastal and marine ecosystems, and the development of innovative technology and solutions.

### **Legal, Technical and Operational Capacity**

The legal framework for sargassum management in the Dominican Republic is robust and encompasses several regulation levels:

- **Constitution of the Dominican Republic: *Articles Related to Natural Resources*:** These articles establish that natural resources are part of the country's heritage. The exploitation of these resources by private parties may only be carried out through concessions, contracts, licenses, permits or quotas, and always in accordance with the provisions of the law.
- **General Law of Environment and Natural Resources No. 64-00 Article 68:** This article establishes the obligation to carry out an Environmental Impact Assessment for any activity that may have a significant impact on the environment, including the construction of infrastructure for sargassum management.
- **CONUEE Resolution No. 001-2015: Guidelines for Sargassum Management:** This resolution establishes specific guidelines for the management and use of sargassum. It aims to ensure the protection of the environment and natural resources, and covers collection, transportation, storage, treatment and final disposal of sargassum.
- **Decree 379-23 of August 21, 2023 creating the Cabinet to Fight Sargassum,** a council that will coordinate policies to mitigate the effects of sargassum on the Dominican coasts, integrated by ministers and representatives of the private sector. This council will seek comprehensive solutions, including financial support, to address this environmental and tourism problem, contributing to the recovery of beaches and the reactivation of tourism in the country.
- **Maritime-Terrestrial Zones and Tourism Laws: Law No. 305-68 on Maritime-Terrestrial Zones and Coasts:** This law establishes limitations on the construction of infrastructure in the coastal zone, which is relevant to any project involving sargassum management near beaches.

	<p>- <b>Law No. 541-14 on Tourism:</b> This law establishes measures to protect and conserve the country's tourism heritage, which is relevant due to the impact of sargassum on this industry.</p> <p><b>Expanded Technical and Operational Capacity</b></p> <p>The technical capacity to implement this project is high, supported by several governmental and academic institutions with experience in marine and coastal ecosystem management. The use of advanced technology, such as drones and satellite sensors, is planned to monitor real-time sargassum accumulation. In addition, it is planned to establish research and development laboratories to study the properties of sargassum and find alternative uses for this biomass.</p> <p>Technical training programs will be carried out to train local workers in the use of this machinery and technology, as well as in best practices for sustainable sargassum management.</p>
2.3	<p><b>JUSTIFICATION FOR INTERVENTION:</b> Please describe how the need for the Project was determined and provide rationale/justification for the Project (why this Project is considered to be the most effective way to solve the problems identified).</p> <p><b>Determination of Project Need:</b></p> <p><b>Context and Quantitative Data:</b></p> <ul style="list-style-type: none"> <li>- <b>Ecological Impact:</b> Decomposing sargassum affects water oxygenation, leading to "dead zones" with hypoxic or anoxic conditions in coastal ecosystems such as mangroves and coral reefs.</li> <li>- <b>Economic Impact:</b> In the Bávaro, Punta Cana region, recorded instances of sargassum presence showed a significant increase in 2023, with 42.5% in April, correlated with a decrease in hotel occupancy. The University of South Florida reported that, in 2023, sargassum arriving in the Caribbean had a length of approximately 8,800 kilometers and weighed 10 million tons.</li> </ul> <p><b>Justification:</b></p> <p>The accumulation of sargassum has devastating effects on the environment, economy and public health. The situation is critical and requires immediate and effective intervention. For this reason, this project has been developed with a rationale and justification that make this project effective:</p> <ul style="list-style-type: none"> <li>- <b>Comprehensive Approach:</b> Addresses prevention, monitoring and mitigation, offering a complete solution to the sargassum problem.</li> <li>- <b>Multisectoral Participation:</b> Involves government, private and civil society institutions, ensuring a more effective and diverse response.</li> <li>- <b>Scientific and Technical Basis:</b> Uses validated methods for sargassum monitoring and collection, ensuring effective results.</li> </ul>



	<ul style="list-style-type: none"> <li>- <b>Financial Sustainability:</b> Designed to be profitable, with the potential to reuse collected sargassum, which could generate additional income.</li> <li>- <b>National Benefit:</b> With tourism as one of the economic pillars of the Dominican Republic, the project has the potential to benefit the country as a whole.</li> </ul> <p><b>Key Project Actions</b></p> <p><b>Monitoring and Early Warning System:</b></p> <ul style="list-style-type: none"> <li>- Implement marine sensors and satellites for real-time monitoring.</li> <li>- Establish a notification system for communities and authorities.</li> </ul> <p><b>Shore and Shallow Sargassum Collection and Crushing System:</b></p> <ul style="list-style-type: none"> <li>- Involve local communities in sargassum collection.</li> <li>- Use specialized machinery to crush sargassum into smaller particles.</li> </ul> <p><b>Barge System with Sargassum Collection and Pumping in the Coastal Zone:</b></p> <ul style="list-style-type: none"> <li>- Use barges equipped with pumping systems.</li> <li>- Capacity to collect up to 50 tons of sargassum per day.</li> </ul> <p>In summary, the need for this project is based on quantitative and qualitative data demonstrating the negative impacts of sargassum. The justification for the intervention centers on its comprehensive approach, multi-sectoral participation, and alignment with the Dominican Republic's sustainable development needs and objectives.</p>
	<p><b>LESSONS LEARNED:</b> If there have been any similar projects to this Project implemented within or outside of the partner country, please provide the brief description of such project(s), including lessons-learned from implementing the project(s). Explain also whether these lessons were incorporated and reflected into this Project's designing process. If this Project is designed under a national/international initiative and/or program, describe main results of such imitative/program, and provide a plan to link them with this Project.</p> <p>Regarding the evaluation result of KOICA projects, please find KOICA Evaluation System(Reference link: <a href="https://koica.go.kr/sites/evaluation_en/main.do">https://koica.go.kr/sites/evaluation_en/main.do</a>)</p>
2.4	<p><b>Similar Projects and Lessons Learned:</b></p> <p><b>Littoral Barriers and Collection Vessels:</b></p> <ul style="list-style-type: none"> <li>• <b>Description:</b> Littoral barriers have been used to prevent or delay the arrival of sargassum on shore. In addition, boats have been used to remove floating marine debris and deposit it in a controlled manner.</li> <li>• <b>Lessons learned:</b> It is essential to design an economically viable system that favors the circular economy, optimizes cleanup costs and cares for the natural environment. Anti-silt barriers (adaptations of absorbent barriers), have proven to be useful, but with limitations.</li> </ul> <p><b>Case Study "Combating sargassum in Punta Cana":</b></p>

- **Description:** In 2018, the Punta Cana Group Foundation countered a massive arrival of sargassum by developing prototype barriers at sea.
- **Lessons learned:** Interdepartmental collaboration and continuous innovation are essential to effectively address the sargassum problem.

#### **Satellite Monitoring in the Mexican Caribbean:**

- **Description:** Since 2018, a satellite remote sensing monitoring system has been used in Quintana Roo, Mexico, alerting on the arrival of sargassum.
- **Lessons learned:** Satellite remote sensing is a valuable tool for early warning and preparedness against the arrival of sargassum.

#### **Vessels in the Mexican Caribbean:**

- **Description:** Similar vessels have been used in the Mexican Caribbean to collect sargassum.
- **Lessons Learned:** Vessels face limitations in swell conditions and when handling large volumes of sargassum. Stability and crushing capacity are essential for efficient collection.

#### **U.S. Patent Pending Method:**

- **Description:** A specific method has been tested in the USA for the collection and management of sargassum.
- **Lessons Learned:** It is crucial to adapt the equipment to the right dimensions and distribute more pieces of equipment according to the area to be covered in order to optimize the operation.

#### **Incorporating Lessons in the Project Design:**

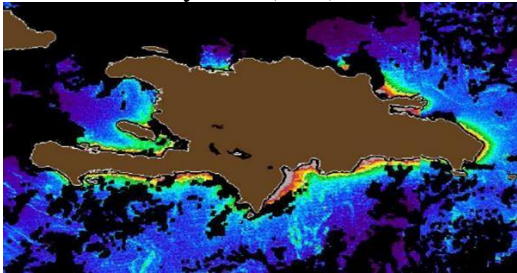
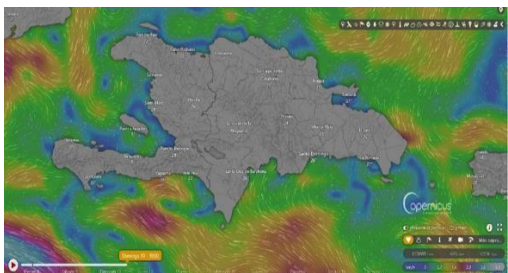
Lessons learned from previous projects have been fundamental in the design of this proposal. Special emphasis has been placed on:

- **Vessel Stability:** Highly stable vessel specifications have been developed to improve collection in swell conditions.
- **Equipment Optimization:** Based on lessons learned from the method proven in the U.S, equipment has been adapted to cover larger areas and reduce operating hours.
- **Circular Economy:** We are looking for an approach that not only clears sargassum, but also reuses it, promoting sustainability and reducing costs.

#### **Linkage with National/International Initiatives:**

This project aligns with the initiative of the Multisectoral Roundtable for Integrated Sargassum Management, coordinated by the Dominican Republic's Ministry of Environment and Natural Resources. The proposal thus presented seeks to integrate the solutions and recommendations derived from this roundtable, ensuring a

	<p>cohesive and effective response to the sargassum problem, which is now handled directly by the sargassum management cabinet created by presidential decree.</p> <p>Additionally, the satellite monitoring component will not be limited to the Dominican Republic. This early warning and monitoring system has the potential to be extended to other Caribbean islands, providing a valuable tool for regional preparedness and response to the sargassum phenomenon.</p> <p>The implementation of this project will serve as a catalyst for collaboration among various Caribbean islands, strengthening the region's capacity to address this environmental and economic challenge more effectively.</p>
<b>SECTION 3. PROJECT DESCRIPTION</b>	
<b>3.1</b>	<p><b>Objective/Outcome/Output:</b> Please outline objectives, expected outcomes, and outputs of the Project.</p> <p><b>General Objective:</b> To develop a comprehensive and sustainable approach to sargassum management along the Dominican Republic's coasts, mitigating its impact on marine ecosystems and the local economy, and establishing a replicable model for other Caribbean countries.</p> <p><b>Specific Objectives and Expected Results:</b></p> <ul style="list-style-type: none"> <li>• Implement an early warning and continuous monitoring system for the arrival of sargassum to the coasts.</li> <li>• Create and implement a comprehensive system for collecting and shredding sargassum on the shores and shallow areas of coastal zones, with the purpose of restoring the environmental quality of the beaches and encouraging the active participation of local communities in the sustainable management of marine ecosystems.</li> <li>• Establishment of a Barge System for the Collection and Pumping of Sargasso in the Coastal Zone.</li> </ul> <p><b>Expected Results:</b></p> <ul style="list-style-type: none"> <li>• Develop a Remote Monitoring Network and Countrywide Early Warning System, using GIS (Geographic and Environmental Information System) technology.</li> <li>• Capacity to predict the arrival of sargassum at least one week in advance.</li> <li>• Real-time information with exact geographic location via GPS.</li> <li>• Environmental assessment and monitoring of the most affected marine ecosystems.</li> </ul>

	<ul style="list-style-type: none"> <li>• Reduce the use of heavy machinery on beaches and the time required for collection.</li> <li>• Reduced beach erosion and protection of neighboring urban areas.</li> <li>• Facilitate cleanup in areas that are difficult for heavy machinery to access.</li> <li>• Implement the Pezгато Protocol to effectively collect and crush sargassum.</li> <li>• Reduce the volume of sargassum and its buoyancy.</li> <li>• Effective removal of sargassum before it negatively affects coasts and the tourism industry.</li> </ul> <p><b>Output</b></p> <ul style="list-style-type: none"> <li>• Protocols and guidelines for the integrated management of sargassum.</li> <li>• Environmental monitoring and evaluation reports.</li> <li>• Training and sensitization of local communities and relevant authorities.</li> <li>• Development of technologies and methods for the collection and utilization of sargassum, including its transformation into biofertilizers, alginates, etc.</li> </ul> <p><b>Linkage with Other Projects and Initiatives:</b></p> <p>This project aligns with national and international initiatives and has the potential to be extended to other Caribbean countries, strengthening the region's capacity to address this environmental and economic challenge more effectively.</p>
3.2	<p><b>Activities:</b> Please outline planned activities, the timing, duration and the responsible bodies for each activity. Please indicate the sequence of all major activities and implementation milestones.</p> <p>The project is seeking to implement the following activities:</p> <p>Specific Objective 1: Implement a continuous monitoring system and an early warning system for the arrival of sargassum to the coasts.</p> <p><b>Development of a Remote Monitoring Network and a Statewide Early Warning System:</b> This component focuses on implementing a continuous monitoring system for the arrival of sargassum to the Dominican Republic's coasts through the implementation of a Remote Monitoring Network and a Countrywide Sargassum Early Warning System through a Geographic and Environmental Information System (GIS).</p> <div style="display: flex; justify-content: space-around;">   </div> <p>Activities:</p>

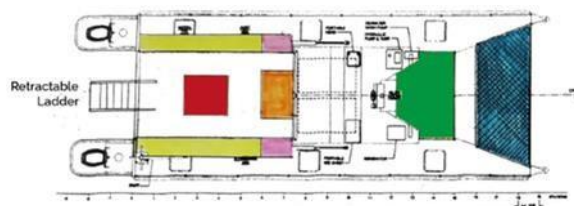
- Acquire remote monitoring equipment.
- Purchase and implement monitoring and early warning software.
- Purchase and install equipment that will make up the national sargassum monitoring center.
- Train personnel in the use and maintenance of the system.

Specific Objective 2: Create and implement an integrated system for the collection and crushing of sargassum on the shores and shallow areas of coastal zones.

**Implementation of the Sargassum Collection and Shredding System:** This system aims to clear beaches and shallow areas of sargassum, involving local communities in the collection and shredding process to promote social participation, reducing the presence of heavy machinery on beaches and collection time. In addition, beach erosion is reduced, which serves as a means of protection for neighboring urban areas, and cleaning is facilitated in areas that are difficult for heavy machinery to access. The project seeks to implement a sustainable and efficient sargassum management protocol through the use of modified machinery in aquatic environments, transforming organic matter into smaller particles, which will allow for proper management and the possibility of using the biomass in sustainable products.

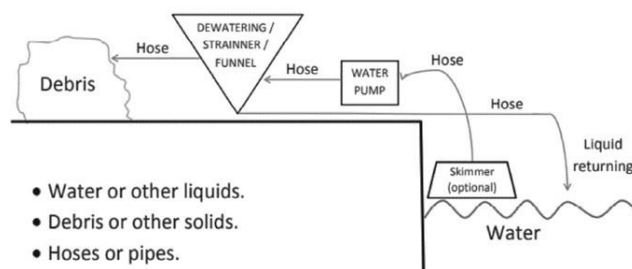
**Activities:**

- Acquire specialized machinery to collect and crush sargassum.
- Purchase machinery.
- Organize training workshops.
- Implement the system in coastal areas.



SKETCH

**METHOD TO REMOVE DEBRIS (BIOTIC-ABIOTIC) FROM LIQUIDS**



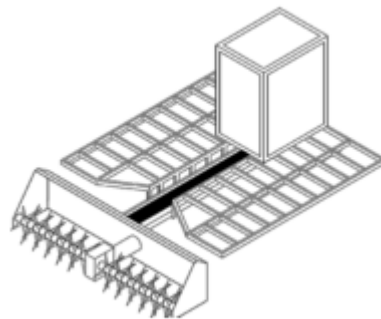
Specific Objective 3: Establish a Barge System to collect and crush sargassum in the coastal zone

**Barge System to collect and crush sargassum in the coastal zone**

This project proposes the transformation of existing machinery into floating units specialized in collecting and crushing sargassum and other aquatic plants. The process includes suctioning surrounding water, rich in brown tide, eutrophicated water and organic sludge. All shredded material is then pumped through a piping system for environmentally conscious dispersal on shore, in the water, or transfer to a collection site for reuse.

The integrated design allows a single vessel to handle both the collection and treatment of floating plant materials, ensuring an environmentally sustainable and functionally efficient operation. The approach is focused on mitigating the negative environmental impact generated by the accumulation and decomposition of sargassum, while promoting active participation in the protection and conservation of coastal ecosystems.

This innovative approach utilizes barges equipped with customized machinery to maximize efficiency in collecting and processing sargassum, ensuring environmental preservation and operational viability at every stage of the project.



Activities:

- Contracting engineering companies to adapt and modify machinery
- Testing and adjustment of adapted machinery.
- Other testing.

Capacity building:

The project contemplates a cross-cutting capacity building component, essential to ensure the sustainability and long-term impact of the proposed interventions. Specific activities will be carried out to train institutions, local governments and coastal populations in the efficient and effective use of sargassum monitoring, collection and management systems. In addition, significant efforts will be made to raise awareness among the general population about sargassum's adverse effects and the importance

of proper management. This component will also include training and technical assistance for the development of new businesses based on sargassum, with a special

focus on the circular economy. Innovation and entrepreneurship will be promoted, providing seed capital support for promising initiatives that contribute to the sustainable use of sargassum, transforming it from an environmental problem to an opportunity for economic and social development.

Activities:

- Design and develop a specialized training program for professionals in the area.
- Hire experts for training.
- Conduct training courses for local communities.

**Develop Protocols and Guidelines for Integrated Sargassum Management**

- Formulate protocols and guidelines.
- Create a methodology for the in situ assessment of beaches affected by sargassum.

**Knowledge Transfer to Other Caribbean Countries.**

- Organize international workshops and seminars.
- Plan and organize events.
- Create training material and documentation for knowledge transfer.

**Promote ventures for the utilization of Sargassum:**

- Entrepreneurship and circular economy training.
- Design and implement training programs.
- Technical assistance to entrepreneurs.
- Support entrepreneurs with seed capital.
- Promote the transformation of sargassum into useful products (biofertilizers, alginates, etc.).
- Training and assistance in the transformation of sargassum.

3.3

**Budget:** Please fill out this budget table based on the proposed outputs and activities of the Project. Once the PCP is selected, the detailed budget plan will be requested. This information is to assist KOICA to better understand the scope of the Project.

Output	Activity	Sub-Activity	Proposed budget (USD)
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	1. Monitoring and Early Warning System	Procurement and implementation of monitoring and early warning software	Hiring developer, software testing and tuning.	2,000,000
		Purchase and installation of equipment for national sargassum monitoring center	Install monitoring system	500,000
	2. Shore and Shallow Sargassum Collection and Shredding System	Acquisition of specialized machinery.	Purchase harvesting and shredding machinery.	1,500,000
		Management and operation	Training for barge handling, harvesting, crushing and pumping operations.	600,000
	3. Barge System with Sargassum Collection and Pumping in the Coastal Zone	Contract engineering companies	Equipment, materials and operations for collecting, crushing and pumping sargassum	1,400,000
		Testing and adjusting adapted machinery.	- Field tests and necessary adjustments.	900,000
	4. Entrepreneurship and Circular Economy	Personnel training	Specialized training courses.  Update and calibrate equipment.	270,000
		Awareness and Training Program on circular economy and sargassum use.	Workshops and courses on circular economy and sargassum use.	200,000
		Knowledge transfer to other Caribbean countries	Regional seminars	300,000

		Technical assistance for entrepreneurs	Consulting and mentoring for entrepreneurs.	350,000
		Seed capital support for sargassum-related ventures.	Seed capital fund for entrepreneurship.	1,000,000
	Operating and administrative costs (including personnel, barge handling, on-site evaluation, etc.)	Project staff (Project Coordinator, Procurement Specialist, Analyst 1, Analyst 2, Driver, Administrative Assistant)	Recruit key personnel for the project.	570,000
		Barge maintenance and operation	Barge operating and maintenance expenses.	200,000
		Onsite evaluations	Conduct periodic onsite evaluations	150,000
		Other operational expenses	Miscellaneous operational expenses	60,000
			Total	10,000,000

#### SECTION 4. STAKEHOLDER ANALYSIS

	<p><b>TARGET BENEFICIARY:</b> Please describe the following information: a) direct and indirect/wider beneficiary group, b) number of beneficiaries, with gender segregation data if possible (e.g. 300 children (150 girls and 150 boys) rather than children in 3 schools), c) how the target group was identified, d) why they are selected as target group, e) how these potential beneficiaries have been involved in the Project design process, and their expected role(s) in the Project implementation and evaluation.</p>
4.1	<p>This project will directly benefit the tourism and fishing industries. In the case of the former, by the end of 2023, it is projected to reach 850,900 jobs, totaling more than US\$16.7 billion, representing 15% of the Dominican economy. On the other hand, the fishing sector contributes 0.5% of the country's GDP.</p> <p>These sectors play a vital role in promoting economic development, especially in coastal regions where tourism activities are concentrated. Maintaining a pristine, sargassum-free coastline is crucial to improving the country's competitiveness in the tourism market, since the country faces competition from other destinations in the region. Providing a clean and pleasant coastal experience is key to attracting and keeping tourists.</p>

	<p><b>Coastal dependence:</b> The tourism and artisanal fishing sectors rely heavily on the country's coastal areas, which boast stunning beaches and rich marine ecosystems. These natural assets are key attractions for tourists, providing opportunities for beach-oriented leisure activities, water sports, and relaxation.</p> <p><b>Vulnerability to sargassum flows:</b> Sargassum inflows represent a substantial threat to the Dominican Republic's tourism sector. The accumulation of sargassum on beaches and in coastal waters negatively affects the aesthetic appeal, recreational value, and overall experience for tourists. Consequently, this can lead to a decrease in tourist arrivals, hotel occupancy rates, and revenues for businesses operating in the sector.</p> <p><b>Market competitiveness:</b> Maintaining a pristine, sargassum-free coastline is crucial to improving the country's competitiveness within the tourism market. The Dominican Republic faces competition from other destinations in the region, and providing a clean and pleasant coastal experience is key to attracting and keeping tourists.</p>
	<p><b>STAKEHOLDERS:</b> Please analyze the recipient(implementing) organization's capabilities, size, legal and political status, scope of work, functions, and finances. In this analysis, include also the size of personnel and budget over the past 3-5 years.</p> <p>Please describe other stakeholders (e.g. partner government agency, international organization, NGO, donor agency, etc.), if any, including a) name/group, b) respective role(s) and cooperation/coordination mechanism, etc.</p>
4.2	<p><b>Receiving Organization:</b> The Presidency recently created the Cabinet for the Integral Management of Sargassum, functioning as an intersectoral coordinator at different levels. The Ministry of Environment and Natural Resources, along with other vice ministries, has established an inter-institutional table to coordinate actions against sargassum.</p> <p><b>Ministry of Tourism and the National Hotel and Restaurant Association (ASONAHORES):</b></p> <ul style="list-style-type: none"> <li>- <b>Role:</b> Create the Sargasso Mitigation and Management Fund.</li> <li>- <b>Cooperation:</b> Joint contribution of US\$11,891,884.00 and creation of a Public-Private Monitoring Commission.</li> </ul> <p><b>Food and Agriculture Organization (FAO), Punta Cana Group Foundation and Ministry of Agriculture:</b></p> <ul style="list-style-type: none"> <li>- <b>Role:</b> Develop a program to value sargassum as a bio-input.</li> <li>- <b>Cooperation:</b> Working committee including MMARN and MEPYD (Ministry of Economy, Planning and Development).</li> </ul> <p><b>Mexican Government:</b></p>

- **Role:** Financial support for sargassum related initiatives.
- **Cooperation:** Mexico-Dominican Republic bilateral cooperation project.

**Fundación Grupo Punta Cana and Algea Nova:**

- **Role:** Major players in sargassum containment, collection, beach cleanup and research.
- **Cooperation:** Agreements and alliances with various organizations and companies.

**SOS Carbon and other NGOs:**

- **Role:** Build alliances for the valorization of sargassum.
- **Cooperation:** Agreements with the private sector and foreign companies.

**Academic Institutions (INTEC and UNAPEC):**

- **Role:** Organize international seminars and develop a sargassum research network.
- **Cooperation:** Inter-university agreement signed in July 2022.

**BENEFICIARY OBJECTIVE**

**a) Direct and Indirect Beneficiary Group:**

- **Direct:** Local coastal communities, tourism and artisanal fishing sector, government entities and local organizations.
- **Indirect:** National and international tourists, local and national economy, tourism and fishing related business sector.

**b) Number of Beneficiaries:**

- Y Coastal communities: ~10,000 residents
- Y Tourism sector: Projected at 850,900 jobs by 2023
- Y Tourists: ~1,000,000 annually
- Y Fisheries Sector: ~5,000 fishermen and workers
- Y Local and National Economy: 50 SMEs

**c) How the Target Group was identified:**

The target group was identified through a comprehensive analysis of the regions most affected by sargassum and those that rely heavily on tourism and fishing. Surveys and interviews were conducted in coastal communities to better understand the needs, challenges and expectations of local residents and tourism and fishing related businesses. In addition, impact studies were conducted to assess how sargassum affects daily life, the local economy and employment in these areas.

	<p><b>d) Why they were selected as a target group:</b> They were selected as a target group because of their direct exposure and vulnerability to sargassum inflows. Local coastal communities and the tourism and fishing sectors are on the front lines of impact, facing significant economic losses and environmental damage due to sargassum. In addition, their well-being and livelihoods are linked to the health and beauty of Dominican coasts, making their active and beneficial participation in sargassum mitigation and management essential.</p> <p><b>e) How these Potential Beneficiaries have been Involved in the Project Design Process and their Expected Role in Project Implementation and Evaluation:</b> Potential beneficiaries have been involved in the project design through community consultations, workshops and feedback meetings. These events have allowed beneficiaries to voice their concerns, propose solutions, and contribute their local knowledge to the project design.</p> <p>During project implementation, local coastal communities and government entities are expected to actively participate in training and awareness-raising activities. Specific workshops and training programs will be organized to equip local communities with the necessary skills and knowledge to effectively participate in sargassum management.</p> <p>In addition, regular communication channels will be established to ensure that beneficiaries can provide continuous feedback on the effectiveness of the interventions implemented and suggest improvements. They will also be encouraged to participate in project evaluation, helping to measure the impact and effectiveness of project activities in their communities and sectors.</p> <p>In the evaluation phase, review and evaluation meetings will be organized with beneficiaries to discuss project achievements, challenges and lessons learned. Their input will be crucial in making necessary adjustments and improvements, ensuring that the project continues to effectively meet their needs and expectations.</p>
<b>SECTION 5. PROJECT MANAGEMENT AND IMPLEMENTATION</b>	
	<p><b>PROJECT MANAGEMENT:</b> Please describe a) who will be responsible for the planning, management and operation of the Project, as well as coordinating other bodies and organizations associated with the Project, b) what arrangements will be established to ensure the effective coordination between this Project and other relevant programs/activities within the partner country.</p>
<b>5.1</b>	<p><b>a) Responsible for the Planning, Management and Operation of the Project:</b></p> <p>The project will be under the supervision of the Cabinet for Integrated Sargassum Management, created specifically to coordinate inter-sectoral efforts at the central, regional and local levels in the Dominican Republic. This entity will be primarily responsible for project planning, management and operations, ensuring that all activities are carried out as scheduled and that objectives are met.</p> <p>The Ministry of Environment and Natural Resources, together with three related vice-ministries, will coordinate the implementation of project activities in the field,</p>

overseeing the acquisition and installation of equipment, personnel training, and the execution of sargassum collection and management operations.

The Joint Public-Private Monitoring Commission, formed together with the Ministry of Tourism and ASONAHORES, will oversee the sargassum mitigation and management fund, ensuring that funds are used efficiently and effectively for project activities.

**b) Arrangements to Ensure Effective Coordination with Other Relevant Programs/Activities:**

To ensure effective coordination with other relevant programs and activities within the country, an Inter-Institutional Table for the Coordination of Actions against Sargassum will be established. This table will facilitate regular communication and collaboration between the different entities and organizations involved in sargassum management in the Dominican Republic.

Regular meetings will be organized to share updates, discuss challenges and coordinate efforts among the different programs and activities related to sargassum. This will ensure that all initiatives work in a complementary manner, maximizing impact and avoiding duplication of efforts.

In addition, clear communication and collaboration protocols will be established with other related projects and initiatives, both nationally and internationally. This will include coordination with the Mexico-Dominican Republic bilateral cooperation project on sargassum and collaboration with international organizations such as FAO and other relevant entities.

**The Project Location Map is required to be submitted together with the PCP.**

**Appendix 1. Project Location Map**



Please insert a map of the country with the precise project location marked or colored.



Map of the Massive Arrival of Sargassum Pelagic in the Dominican Republic August 2023



Please provide detailed information in relation to the accessibility of the project site(s).

- Land ownership and legal status of the project area. Identify whether the project sites include any privately-owned lands.
- Distance from the capital city, travel time and available modes of transportation.
- Administrative distinct/division information: Provide accurate administrative unit information in which your project plans to intervene.
- Risk factors: Provide any potential risks identified due to the geographic location of this project.
- Additional information (if any):