Stakeholder Consultation on Sinking Seaweed

Consulta con las partes interesadas sobre el hundimiento de algas

Consultation des parties prenantes sur le naufrage des algues

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EXTENDED ABSTRACT

INTRODUCTION

At 420 ppm CO_2 concentration in the atmosphere, reducing emissions is not sufficient and so CO_2 sequestration from the atmosphere is necessary. To meet the temperature goal of the Paris Agreement, scaling up Carbon Dioxide Removal has been deemed as an "urgent priority" towards rapidly reducing emissions (Smith et al 2023). Marine-based Carbon Dioxide Removal (mCDR) aims to use the ocean's capacity for sequestering carbon to offset atmospheric CO_2 concentrations. Ocean Storage of Biomass (OSB) by sinking carbon rich biomass to the deep ocean is one viable mCDR pathway. Siegel et al 2021 found that deeper than 1800m, carbon remains sequestered for 900 years. Additionally, OSB can help countries reach their Nationally Determined Contributions (NDCs) and gain revenue when voluntary carbon markets pay for carbon sequestration.

Sinking seaweed to the deep ocean is a highly viable mCDR method that can aid in mitigating the current Sargassum crisis which has been affecting the Caribbean for several years. Wu et al. 2023 found that macroalgae open ocean mariculture and sinking may successfully grow and sequester carbon under certain conditions. Additionally, there is a need for the development of environmentally beneficial pathways for the valorization of Sargassum. Sinking Sargassum to the deep sea as a means of mCDR and gaining carbon credits has emerged as one of those pathways.

At GCFI77, Seafields held a Sargassum solutions session that allowed input from regional experts on the ways in which Sargassum can be monitored, managed and used as a resource. A Stakeholder Consultation followed these talks. During this consultation, we aimed to determine the views of regional stakeholders on sinking Sargassum to the deep sea.

METHODOLOGY

Using the platform AhaSlides, we created an interactive presentation with questions geared towards gathering their thoughts on Sargassum sinking to the deep sea along with several background questions. The presentation was projected with the QR code so that attendees both present in the room and those attending virtually could access the survey from their personal devices and log their responses. Forty-three people participated in the survey. The questions comprised of two scales, four multiple choice questions, two-word clouds and one open-ended question. For each quantitative question, the responses are represented as percentages. For the qualitative questions, recurring themes were extracted, collated and the number of mentions were determined and tabulated.

Table 1. Countries and territories of survey respondents

Countries	No. of respondents
Antigua and Barbuda	1
Barbados	1
The Bahamas	8
Grenada	1
Guadeloupe	10
Martinique	5
Mexico	1
Puerto Rico	1
Saint Kitts and Nevis	1
Saint Lucia	2
United States	1
Trinidad and Tobago	1

Table 2. Suggested duration for a study on sinking Sargassum to the deep-sea.

Duration	Mentions
10 years	8
6 years	1
5 years	11
4 years	1
3 years	3
2 years	3
1 years	3
Ongoing	2
Varied	1

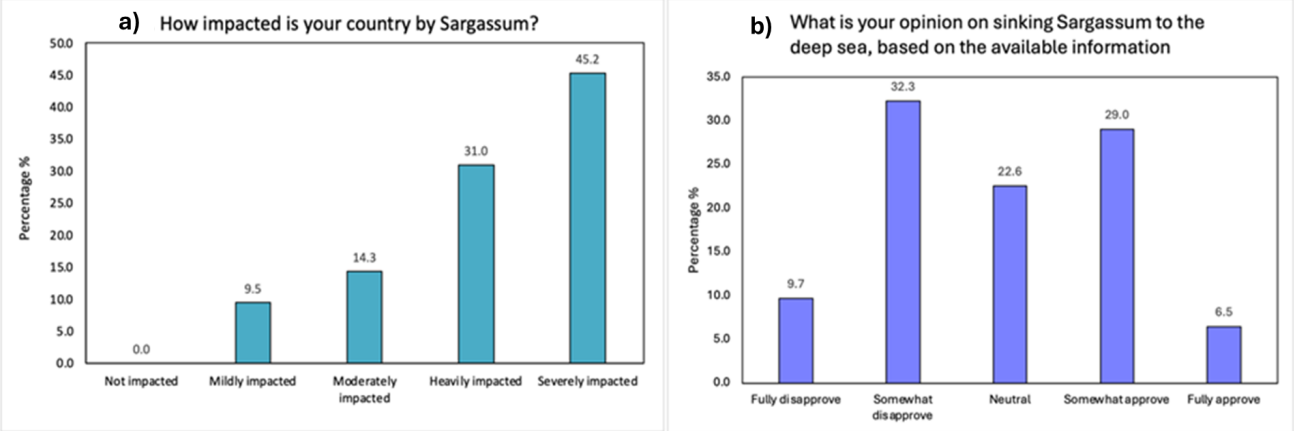

Figure 1. a) Severity of Sargassum impact and **b)** Opinions on sinking Sargassum to the deep sea.

RESULTS

The majority of the respondents were from the French West Indies (45%) and the Bahamas (24%) (Table 1). Forty-one percent of respondents identified as conservationists, 23% were students, 18% considered themselves academic, 12% were government officials, 3% were educators and 3% were fishers. All survey participants were from countries impacted by Sargassum. Their responses were skewed towards the higher end of the scale (Figure 1) with 45.2% severely impacted, 31% heavily impacted, 14.3% moderately impacted and 9.5% mildly impacted.

When the stakeholders were asked for their opinion on sinking Sargassum to the deep sea based on available information, a bimodal distribution emerged (Figure 2) as responses were clustered to the middle of the scale. From the responses, 32.3% of the respondents somewhat disapprove while 29% of respondents somewhat approve. On the extreme ends of the scale, 9.7% fully disapprove and 6.5% fully approve while 22.6% of respondents were neutral on sinking Sargassum to the deep sea. Subsequently, regarding if their opinions changed based on the presentations at the session, 55% of respondents' opinions remained unchanged while 42% of respondents were more in favour of sinking Sargassum and 3% were less in favour.

Seventy percent of the stakeholders who responded believed their community would support Sargassum sinking as a way of also generating revenue through carbon credits in addition to reducing the amount in landfills. Around 27% of respondents believed their community would only support Sargassum sinking to the deep as a way to reduce Sargassum in landfills and only 3% thought neither of the options would be supported by their community.

The types of carbon credits that stakeholders would deem useful for their communities is important towards determining the valorisation pathways for Sargassum. Most of the respondents were interested in biochar addition to agricultural soil and avoidance of methane emissions at landfills by producing Sargassum products at 34% and 30% respectively. Biochar addition into construction materials followed at 23%. Carbon credits from sinking Sargassum to the deep sea was least useful to the stakeholders' communities at only 13% of respondents.

The stakeholders submitted several responses via a word cloud on what needs to be studied more in order to make an informed decision on Sargassum sinking several themes emerged (Table 2). Studies towards understanding the deep-sea benthic habitats and the long-term effects on the health, stability and functioning of these ecosystems were of paramount importance. Some responses surrounding the efficacy of this as a solution were also put forward such as the time of carbon sequestration and storage in the deep sea along with the mineralization rates of organic matter.

The stakeholders gave multiple responses on the how long the study on Sargassum sinking should run. There was a preference towards 5 and 10 year durations. Ten years was the most popular option at 11 mentions, followed by five years at 9 mentions, one year had 5 mentions, while the increments of three and two years had 3 mentions each.

CONCLUSIONS

The key takeaways from the Stakeholder Consultation are that more studies need to be done on sinking Sargassum to the deep sea. The possible revenue generation through carbon credits and the decreasing of Sargassum that goes to landfill are of interest to many stakeholders and their communities. The possibility of using Sargassum as a resource for products such as biochar and bioplastics is also important to them.

Table 3. Suggested information needed for informed decision making on sinking Sargassum to the deep-sea

Theme	Mentions
Ecological and Ecosystem Impacts	22
Deep sea and Benthic Ecosystem effects	14
Long-term Monitoring	9
Cost	7

LITERATURE CITED

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