

# Policy Perspectives

*Perspectives on resource management and environmental policy from the Centre for Resource Management and Environmental Studies (CERMES), Faculty of Science and Technology, The University of the West Indies, Cave Hill Campus, Barbados.*

The Centre for Resource Management and Environmental Studies (CERMES) initiated this occasional outreach publication, **Policy Perspectives**, to share lessons learnt from applied interdisciplinary research. CERMES research is through learning-by-doing collaboration. **Policy Perspectives** may be used by policymakers and advisers to strengthen linkages between applied research and policymaking in the Wider Caribbean Region.

## What are we learning about the uses of sargassum?

### A growing seaweed market worthy of investment?

According to [Transparency Market Research](#), in 2021, the global algae market was valued at US\$20.16 billion, and is expected to reach US\$55.67 billion by the end of 2031. However, rising costs associated with cultivating algae increase the price of value-added products and can pose major marketing challenges for producers. With an abundance of sargassum seaweed washing up on our coastlines that can potentially be harvested and used as raw material, cultivation currently is not among the many pressing challenges of managing sargassum to derive benefits. However, the future directions of sargassum use are uncertain, and this needs to change — through learning.

Governments and private sector stakeholders are already keen for innovations that transform the sargassum influx challenge into solutions that generate tangible benefits for all socio-economic groups. Valorisation of sargassum, both the raw material and value-added products, could be beneficial to Caribbean economies through initiatives as shown below.

### What can we do with the tonnes of sargassum inundation?

Sargassum can catalyse innovation and entrepreneurship! The FAO-CERMES [Sargassum Uses Guide](#) identified a range of potential uses across 14 different sectors including agriculture, construction, energy, cosmetics, retail, pharmaceuticals, to name a few. The amount of sargassum that can be utilized in these products, however, varies. Large scale use is needed.

Over the past two decades entrepreneurs and research teams across the region have been working to develop sargassum businesses at various scales. Biodegradable material, paper products, and cosmetics have been popular small-to-medium-sized ventures. Medium-sized to large enterprises have developed products for agriculture, construction materials and biofuel. However, many initiatives still face diverse challenges.



Source: Sargassum Uses Guide

**Many potential uses, but also many high hurdles**

Despite the possibilities and keen interest across the region in developing sargassum businesses, progress has been slow and there are still relatively few examples of sustainable sargassum businesses and upscaling of sargassum products and services. Why?

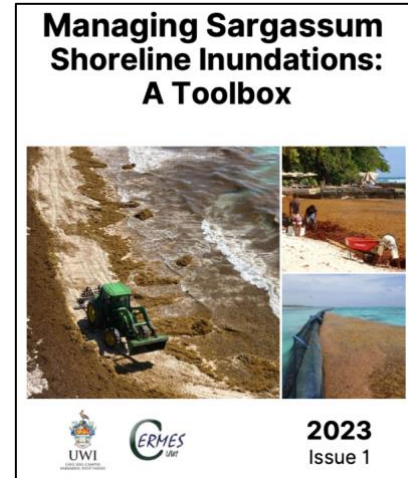
Although sargassum is a “free” natural resource that is relatively accessible with the right and responsibly-used equipment, it has constraints and challenges. These can be grouped into 5 main categories as shown below and then elaborated upon in points:



Adapted from Oxenford et al. (2021)

- **High inter-annual and seasonal variability in the amount of sargassum inundating shorelines**  
Some days coastlines can receive as much as 23,000 metric tonnes of sargassum during peak season, other days there is no sargassum for weeks. Not knowing the approximate volumes of sargassum arriving at any given location over time make it very difficult to sustain businesses, but forecasts are improving.
- **Unpredictable spatial and temporal variability in the precise chemical composition**  
As sargassum drifts into the Caribbean it encounters a variety of oceanic conditions. Different ‘batches’ and morphotypes of sargassum can differ in their chemical composition and micro-pollutant load, thus requiring continued testing of sargassum to assure suitable quality for safe use. This can be expensive!
- **Inorganic arsenic content has stalled popular uses**  
Sargassum has a high capacity to absorb toxic inorganic arsenic from the environment. Studies across the Caribbean have found that inorganic arsenic concentrations exceed allowed levels for fertilizers and animal feed with implications for human health.

- **Collection of sargassum can be costly**  
A large labour force and/or specialized equipment is required for effective large-scale shoreline or in-water collection, and to minimize environmental damage. A costly up-front undertaking.



Access full document [here](#).

- **Inadequate governance arrangements**  
The lack of well-developed governance arrangements or support for valorization of sargassum continues to constrain the development of sargassum uses. There are issues around ownership and extraction rights to the ‘resource’ in some places.
- **Difficulties in accessing funding**  
Inadequate funding is a major constraint to entrepreneurs looking to valorize sargassum. Credit and equity funding are difficult to access. Government budgets are inadequate for new ventures, especially those with high risk and uncertainty.



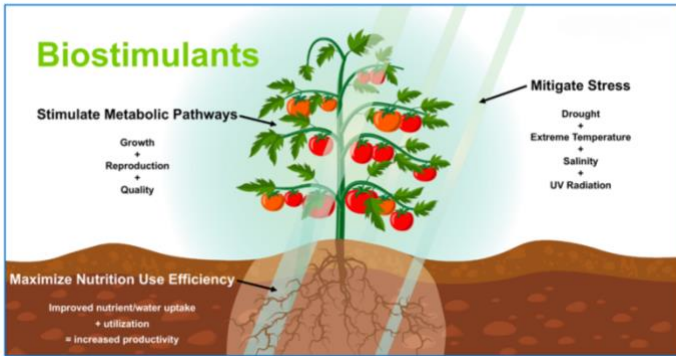
For more information click [here](#).



## Promising products on the horizon- require more science!

- Sargassum extracts promising for biostimulants

The amino acids, polysaccharides, phytohormones, and phenols found in sargassum extracts have been shown to have biostimulant properties. These can make crops more resilient to unfavorable environmental conditions such as lack of water, and high temperatures, thus increasing overall crop productivity.



Source: Corteva Agriscience

- Sargassum could be a breakthrough for biofuel

Sargassum is a promising feedstock for biomethane production due to its fast growth and high yield, low lignin content and ability to capture CO<sub>2</sub>. But, sargassum alone won't produce high yields of biomethane due to its low carbon to nitrogen ratio. It has to be mixed with other biomass to get high yields of methane.

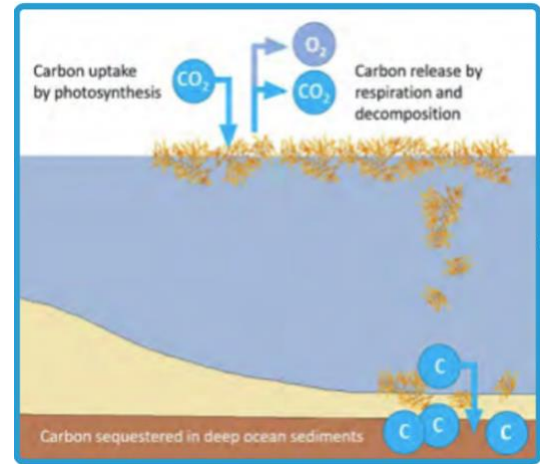
- Sargassum suitable for making activated carbon?

Seaweeds have good biosorption for removing pollutants from air and water. This could be useful in maintaining the water quality of coastal waters for coral reef and seagrass ecosystems that thrive in clean water free of pollutants.

For further information on sargassum uses visit the [Sargassum Hub](#):



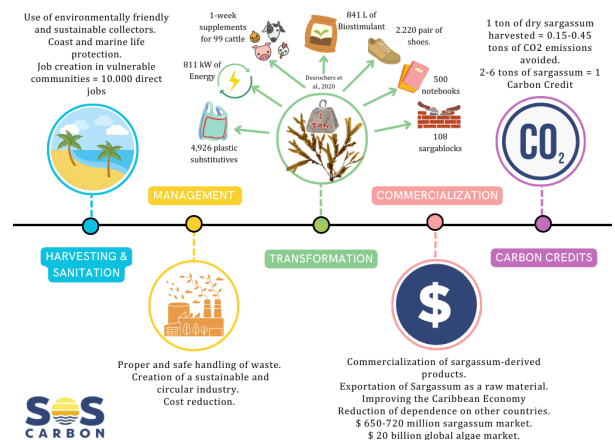
- There could be potential to generate carbon credits
- Sargassum provides an opportunity to use blue biotechnology to create a circular bioeconomy to gain access to the blue carbon market. If it is financially viable and environmentally sound, this could be an opportunity for the Caribbean region to create credits based on tonnes of carbon stored in sargassum.



Source: Sargassum Uses Guide

## The way forward

Looking ahead, large-scale enterprises that use large quantities of sargassum but have flexible demand are needed to really mitigate the impacts of sargassum influxes. In order to flip the script it is important to think about what resources are needed at each step along a value chain from harvesting to end product.



There are some cross cutting activities along the chain such as research and development, keeping a handle on the quality of the product during harvest, post-harvest and during processing. These and more considerations are important for effective business planning and assessing the feasibility of sargassum uses and products. Of course, continued research, partnerships and good collaboration are key as we chart the way forward.