Report of Training Workshop on Improving management of sargassum influxes in the Virgin Islands, UK

The Village Cay Conference Room,
Road Town, Tortola

May 30-31, 2023

Contents

Project Background

Since 2011, sargassum influxes have been affecting the Caribbean region, becoming a recurring threat over recent years in the Eastern Caribbean, including in Anguilla, Montserrat and the Virgin Islands, UK. These influxes have resulted in increasingly negative ecological and socio-economic impacts including biodiversity loss in coastal and marine ecosystems; health impacts associated with emissions of hydrogen sulphide and ammonia; and socio-economic and livelihood impacts in the tourism, fisheries and marine transport sectors.

The project, "Sustainable sargassum management in Anguilla, British Virgin Islands and Montserrat" aims to implement a participatory and multi-level approach to managing the social-ecological system responses to sargassum influxes in order to protect and enhance coastal and marine biodiversity and associated livelihoods. It is being implemented from 2021-2024 by the Caribbean Natural Resources Institute (CANARI) in collaboration with Department of Natural Resources–Anguilla, Ministry of Natural Resources, Labour and Immigration–Virgin Islands, Department of Environment–Montserrat, Centre for Resource Management and Environmental Studies (CERMES) of the University of the West Indies, and the Organisation of Eastern Caribbean States (OECS) Commission. It is funded by a grant from the Darwin Initiative.

One of the key activities under this project is building the capacity of coastal and marine managers and users for sargassum use removal and rehabilitation of affected areas. To this end, training workshops were held in each of the participating territories as follows:

Territory	**Workshop dates**	**Facilitators**
Anguilla	May 4-5, 2023	Dr. Ainka Granderson, Senior Technical Officer, CANARI Dr. Hazel Oxenford, Professor, CERMES
Montserrat	May 23-24, 2023	Ms. Yasa Belmar, Senior Technical Officer, CANARI Ms. Richeda Speede, Research Assistant, CERMES
Virgin Islands, UK	May 30-31, 2023	

Workshop Objectives

The workshop was designed to enable participants to share experiences and to gain a better understanding of the sargassum and best practices related to its management. The original agenda is attached at **Appendix 1** although minor modifications were made during the course of the workshop.

The specific objectives of the workshop were for participants to:

- have an increased and clearer understanding of sargassum, including its origins, ecological value, uses, bloom prediction, and remaining scientific uncertainties;
- be familiar with the principles of sargassum adaptive management within application to coastal and marine resources;
- be able to select the most suitable tools and approaches for monitoring, collection and removal of sargassum and the rehabilitation of affected areas;

- be able to access and utilize data and information on sargassum, including local knowledge, to improve their management decisions; and
- be equipped to effectively engage stakeholders in participatory sargassum management and to communicate about appropriate responses and adaptation approaches.

Participants

Participants in these workshops included coastal and marine managers and users who are affected by sargassum influxes, such as government agencies responsible for natural resources management, fisheries, planning, and disaster management, fisherfolk organizations, civil society organizations, and private sector representatives. The full list of participants for the Virgin Islands is attached as **Appendix 2**.

Structure of the Workshop

On day 1, participants were introduced to the science of sargassum, including the high level of uncertainty associated with that phenomenon and the importance of participatory monitoring and research in supporting decision-making for effective sargassum management. On day 2, the focus was on sargassum adaptive management, including practical approaches to sargassum clean-up and management, selection of tools and approaches for sargassum removal and rehabilitation of affected areas, and effective stakeholder engagement and communication.

Methods

The workshop employed an interactive and participatory format, drawing from participants' experiences and enabling them to apply their learning to their specific contexts. Various facilitation methods were utilized, including plenaries, brainstorming sessions, collaborative small-group tasks, and round-robin discussions.

The facilitators for this workshop were Ms. Yasa Belmar, Senior Technical Officer at CANARI, and Ms. Richeda Speede, Research Assistant at CERMES.

This report provides a summary of the presentations delivered by the facilitators, highlights the key outcomes of group exercises and plenary discussions, and incorporates relevant insights from similar workshop sessions conducted in the other two OTs as relevant. The presentations can be found in **Appendix 3**, and photographs from the workshop are available in **Appendix 4**.

Session 1- Opening

Ms. Belmar opened the workshop by providing a brief overview of supporting project and the workshop's objectives. She noted that while it was branded as a 'trainer of trainers workshop,' it could equally be referred to as an 'asker of askers workshop' since, as we will come to understand, sargassum management raises far more questions than it provides answers.

After Ms. Belmar's introduction, Mr. Mervin Hastings, Deputy Secretary in the Ministry of Natural Resources and Climate Change and project focal point, delivered a brief welcome address. During his speech, Mr. Hastings emphasized the regional nature of the sargassum problem and the necessity for solutions to mitigate what he referred to as the "new norm" for the region. He highlighted the substantial cost of sargassum removal from the beaches, stating that "we must explore alternative solutions to how we can manage the sargassum menace." He welcomed the workshop as an opportunity to engage stakeholders and secure their participation in addressing this issue.

An overview of each session is provided below.

Session 2– Introduction to sargassum science and participatory coastal and marine resource management

The session began with an ice-breaker where provided with sticky notes to write down a burning question(s) they had about sargassum. Then, in round robin fashion, they stated their names, the agency they represented, shared their question(s) with the group. After everyone had their turn, the sticky notes were collected and placed on a flip chart or wall at the front of the room.

The questions asked by participants across the 3 territories covered a broad of topics ranging from its ecological impact and uses to questions about its effects on human health, who/which agencies are/should be responsible and appropriate measures taken to manage and control it. (See Box 1)

The rest of the session aimed to provide answers to these questions using a variety of formats. This included showing the video documentary Drowning in Seaweed, followed by a presentation by Ms. Rozina Norris-Gumbs and Ms. Argel Horton of the Ministry of Natural Resources on Sargassum Management in the Virgin Islands.

They highlighted that the issue of sargassum management has an impact on the OT's Blue Economy. Whilst in small amounts, sargassum influxes can have positive environmental impacts, when it is in large abundance, it causes severe negative environmental, social and economic impacts. She pointed out that the government has thus far conducted successful public education and sensitization campaigns, organized clean-up efforts and conducted limited trials of use in agriculture- the latter of which has been discontinued due to recent studies on heavy metal content. They have also been utilizing drone technology to conduct monitoring of abundance on the most-affected beaches. Ms. Rozina Norris-Gumbs, GIS specialist in the Ministry then briefed participants how drone mapping and satellite forecasts are used to inform sargassum management in the Virgin Islands.

Figure 1 Ms. Argel Horton presenting on sargassum impacts and management in the BVI

Following these presentations, Ms. Richeda Speede gave a short presentation on the basic science surrounding sargassum. After this, the facilitators reviewed the burning questions shared at the beginning of the session, answering the simple ones, but highlighting overall, that there is still much uncertainty regarding sargassum. This uncertainty points to the need for ongoing participatory research and monitoring as part of an adaptive management approach.

Box 1- Burning Questions

Human Health and Safety:

- Is it safe to swim in sargassum-infested waters?
- Are the gases produced by sargassum harmful?
- Does the level of heavy metals affect safety of its use in agriculture?
- Does it affect people living near sargassum?

Uses and Applications:

- Can it be used as a fertilizer/ compost in agriculture?
- What are some alternative uses of sargassum (if it shouldn't be used in agriculture)?
- What is the NPK ratio of sargassum for fertilizer?
- Is the heavy metal content and absorption a problem?
- How can sargassum be beneficial?

Management and Control:

- Are there any strategies for controlling sargassum?
- Can we harvest and control sargassum at sea?
- Are there any measures that can be taken to reduce sargassum production?
- How can we control the smell?
- How can we protect beaches for tourism?

Science of Sargassum:

- The sargassum was not always there. What changed? Where did it come from?
- What is the geographic spread of sargassum?
- What factors are contributing to sargassum influxes?
- What is the role of eutrophication? Why do we hear more about the role of climate change?
- Can we predict future influxes?
- What happens when sargassum breaks down?
- How many species of sargassum exist and which one/s are washing up on our shores?
- What is the growth rate and life span of sargassum?
- Will it ever disappear?
- How does and where does the weed absorb heavy metals from? Is all the weed contaminated or only from certain areas? Are there better strains or weaker strains?

Responsibility and Financial Aspects:

- Who is really responsibility for addressing the sargassum issue?
- Is there any international financial assistance available for clean-up?

Session 3 – Dealing with Uncertainty: Participatory Research and Monitoring

In this session Ms. Richeda Speed introduced the Participatory Research and Monitoring (PRAM) Framework (See **Appendix 5**) developed under the project. If implemented, the PRAM would help to fill knowledge gaps and lead to more evidence-based decision-making regarding sargassum.

Following her presentation, participants worked in groups to make a list of all the current or potential research and monitoring tools that could be utilized to fill knowledge gaps highlighted in the previous session, differentiating between those they thought would be most feasible, potentially feasible if relevant capacity building or material resources were provided, or not feasible at all for their context. Some groups also listed the information or data that the tool would be used to collect.

Highly Feasible	**Potentially feasible**
Offshore Key questions: How does the sargassum moves when it enters the EEZ? What sort of biological communities are associated with the sargassum? Are there any invasives? Tools and approaches: • Sargassum tracking app that can be used by fishermen, yachters, boaters, mariners, airplane passengers to report sargassum • Data collected include: size [of raft], sargassum recognition vs. ocean with the use of a 'grid' • Using AI to help with identification • GPS position • Linkage with met data: Wind direction, Weather to better understand how sargassum moves in the area • Early warning system based on models and focused on the needs and uses for this data • Direction of sargassum travel *Nearshore* • Tide, wind, wave studies at critical sites (using weather bouys) to identify best-case and worst case scenarios for different satellite model predictions	*Offshore* • Sargassum imagery (capacity needed for this to occur). Monitoring when sargassum crosses into the BVI EEX. The application can be used to give information and provide warning reports • Conducting research: Understanding community compositions and how it changes; understand the biology of the sargassum and exploit it as an economic purpose *Onshore* • Education and training on how and when to clean, proper disposal methods, how to treat sargassum at different stages • BVI monitoring ecosystem (user map) • Putting protocol in place • Who is responsible for removal – provision of a contact number • Information available on Government website • Soil testing (government recently received equipment for this) • Air quality monitoring • Water quality monitoring of wells close to shore which are used for agriculture

• Meeting with fisherfolk to collect local knowledge to understand impacts on livelihoods • Studies on deflection, methods of removal • Installing real-time water quality testing equipment at RO plant intakes to determine impacts of influxes on water quality • Determine what new invasive species are coming into our waters • Drone monitoring (however, currently only have one shared drone available) • Education/ capacity building through workshops • Satellite tracking – generation of worst-case/ best-case scenarios *Onshore* • Protocol App – report location and time of sargassum landings • Continue to use drone and transect monitoring (SMP protocol) which covers the volume, species, location for GPS level • Conduct socio-economic monitoring to understand the impact on businesses and the scale of this • Drone and transect SMP – covers the volume, species and location for GPS level	
Not Feasible	
Offshore • Assessing the impacts of sinking sargassum on the deep-sea environment *Nearshore* • Funding for studies, meters, gauges, drones and weather bouys *Onshore* • Soil testing (need equipment and a reliable source of financing for ongoing maintenance • Would need sustainable financing to upkeep testing programme	

Session 3: Field trip

The afternoon sessions consisted of field trips to the following sargassum monitoring sites in each territory:

Territory	**Sites**
Anguilla	Sandy Hill Bay, Cove Bay, and Junks Hole
Montserrat	Little Bay, Woodlands Bay and Margarita Bay
Virgin Islands (UK)	Hodges Creek Marina, Long Bay and Trellis Bay

The primary objectives were to evaluate the influence of sargassum in these areas, examine the data collection methods currently in use, and identify any additional information requirements.

Demonstration drone flights took place in Anguilla and Montserrat; however, adverse weather conditions prevented a flight in the Virgin Islands. The drone team provided insights into the process of setting up a site for drone monitoring and discussed various challenges associated with this approach. These challenges encompassed factors like weather-related flight scheduling constraints, limited drone availability (with some teams sharing access to a single drone provided under the Darwin project), and flight restrictions near certain locations, such as airports. In cases where drone usage was restricted, alternative manual methods were required.

Furthermore, it was emphasized that drone-generated data must be complemented with socio-economic information collected through diverse means, such as surveys, key-informant interviews, and focus groups. Data regarding health impacts on surrounding communities could be gathered through collaboration with public health authorities. Similarly, information on the effects on education, electricity, and water supply could also be acquired from relevant authorities, tailored to local needs and priorities.

During the site visits, participants reviewed the site profiles produced for each site and reflected on the following questions:

- How they could be improved?
- What other aspects needed to be recorded?
- Who has the required expertise?
- Which organisations have the capacity to do this monitoring on a regular basis?
- What should the frequency of monitoring be for these different data sets?

They also learnt how to identify different species of sargassum.

Figure 2 Ms. Richeda Speed explains sargassum species identification during the site visit to Hodges Creek Marina

Figure 3 Sargassum raft at Hodges Creek Marina

Fieldtrips across the 3 territories highlighted the following issues in common:

- Many stakeholders were unaware of the types of data being collected by done monitoring teams and how this data was useful.
- While continuous monitoring is important, this data needs to be analysed, communicated and used in informing decision making regarding sargassum management.
- Vulnerability assessments should play a central role in prioritising the allocation of limited resources. The facilitators emphasized that *exposure* is just one component of vulnerability.

For instance, a site might have a high exposure to sargassum influxes, but if there are few assets or livelihoods affected in that area, the overall vulnerability of the site is low. Consequently, it would not be a priority for management efforts.

- It is important to leverage existing capacities across government, the private sector, and civil society. Establishing mechanisms that facilitate regular communication among stakeholders and encourage collaborative problem-solving is crucial.

Session 4: Debriefing of field trip and day 1

During the first session on Day 2, participants reflected on their key takeaways from Day 1 and the field trip. These were as follows:

Territory	**Key take-aways from day 1 / field trip**

Virgin Islands (UK)	• Long Bay is the most popular beach in the Virgin Islands. It is safe and important for cruise passengers. There are expectations regarding cleaning but how do we decide when it is appropriate to remove sargassum?
	  ○ 2-3 ft build up? – science/ environment
	  ○ What about social/ economic triggers/ metrics?
	  ○ Perceptions related to the aesthetics leads to complaints
	• However, constant grooming accelerates erosion in cleaned areas
	• "The environment is all about people first"
	• Are we setting a precedent (by cleaning beaches too often)?
	• Do we need to change attitudes and perceptions?
	• "educate the people" (so they don't expect such regular cleaning)
	• Perhaps we need " location specific" decisions/ triggers
	• Prevention – collection at sea is preferrable. Requires installation of barriers to deflect the seaweed. "Keep it moving"
	• Must identify the most vulnerable areas
	• How can small businesses help?
	• Working together to find the solutions for the worst affected areas.
	• What do we know about the invasives spread due to sargassum?
	• We need to work together to find the solutions for the worst affected areas.
	• Investigate the cost/ benefits of using skimmers/ booms
	• Need to better understand impact of tides etc. on local dynamics
	• Need for more baseline information
	• Must learn from the experiences of others locally and regionally. Avoid maladaptation

The purpose of this debriefing exercise was to get participants to begin thinking about what data, indicators, research topics and key learning questions surrounding sargassum need to be answered going forward.

Session 5: Assessing tools and approaches for collection and removal of sargassum

This session opened with Ms. Richeda Speede delivering a presentation on tools and approaches for sargassum collection and removal. The presentation offered an overview of various on- and off-shore approaches and tools for addressing sargassum inundations. It also delved into the advantages and disadvantages of these different methods and outlined the recommended selection criteria outlined in the SAMS.

In Anguilla and the Virgin Islands, facilitators then engaged participants in a plenary discussion on their previous experiences with some of the approaches, lessons learnt and their relative advantages and limitations. In Montserrat, due to their limited experience with sargassum removal and collection, participants were instead given an opportunity to ask questions about the different approaches and tools.

In the Virgin Islands workshop, experiences with the tools were as follows:

Lake harvesters

- Two of these machines were purchased by a private company
- They worked but required a conveyor belt
- Couldn't work during rough weather
- Fell into disrepair due to lack of use out of season/maintenance issues

Ocean harvesting/ skimming, shredding, sinking

- Government received a proposal from a private company
- Would require a $10k per day contract
- Uncertain about the potential environmental impacts?

Small scale harvesting experiments

- BVI Kelp – running trials on different approaches to removal, drying for export.
- Successful experiments but questions remain regarding scaling - what's appropriate for small islands when it comes to commodification

Pumps/ Ice Bubblers

- Resorts/ Marinas have utilized pumps and outboard engines to" keep it moving" and away from the desalination plant inlets
- Spent up to $1000/year on fuel
- Expense make it infeasible for long-term operation

Deflection/ Booms

- Using natural wind/ wave dynamics to deflect or keep it moving is preferable
- Not clear how this impacts on marine biodiversity/ fisheries
- Question: Are we creating "feeding stations" for sharks with nets/booms close to shore?

A key lesson emerging out of the VI session was that we need to monitor the impacts of these different tools/approaches.

In Anguilla, the key lessons learned were as follows:

1. Use forecasts (2.5 month in advance) to inform procurement process before influx of sargassum
2. Better communication protocol for clearing beaches to hotel operators, contractors and local communities to encourage 'good practices.'
3. Activate Sargassum taskforce/ coordination mechanism for effective and efficient clean-up and removal and proper oversight by government agencies.
4. Use forecast with link to EWS to identify who should lead with what type of response needed based on size of influx
5. Review prioritization of Anguilla beaches for action based on exposure with impacts on people/ livelihoods

Session 6: Rehabilitation of affected areas and sargassum uses

Ms. Yasa Belmar opened this session by discussing site rehabilitation. Her presentation highlighted the potential harm caused to critical habitats and ecosystems when inappropriate actions are taken to facilitate access and clean up sargassum. She also covered key considerations for different approaches to ecosystem rehabilitation and restoration. Ms. Belmar stressed the importance of gaining a comprehensive understanding of the socio-cultural and economic context, existing hazards, vulnerabilities, and technical requirements before embarking on site rehabilitation. Interventions should prioritize the needs of the most vulnerable and aim to alleviate poverty and promote livelihood development.

Following Ms. Belmar's presentation, Ms. Richeda Speede delved into the uses of sargassum and the feasibility of various options. These uses ranged from small to medium-scale regional initiatives, including the production of bio stimulants, weed suppressants, paper products, to larger industrial endeavours such as manufacturing construction blocks (Sargablock), plant tonics, and biofuels.

Key issues arising from this session across the three OTs included the following:

<u>Rehabilitation and restoration</u>

Anguilla:

- Observed that sargassum piled up to the back of beaches that were regularly cleaned tended to form dune-like structures.
- Small scale experiments with the use of sargassum in dune restoration is ongoing.

Montserrat:

- Near-shore ecosystems were severely affected by volcanic activity, making the protection and restoration of ecosystems crucial.
- Red mangrove propagules are brought to the island via the sargassum rafts, providing source for mangrove restoration activities.
- Not enough is known about the impact of sargassum influxes on coral reefs and sea grass beds, and whether any rehabilitation is required. Collection of baseline data and continuous monitoring is therefore necessary.

Virgin Islands:

- Prevention is better than cure.

- Strengthening and enhancing the enforcement of legislation is required to address issues related to critical ecosystem damage.
- Stricter penalties for activities that harm mangroves.
- There is need for improved education and awareness regarding more appropriate management responses.

Sargassum Use

Anguilla: Small-scale dune restoration experiments.

Montserrat: Initially promoted as composting material for gardening, but there is now a need for awareness about heavy metal risks.

Virgin Islands: Incorporation into road construction on Mosquito Island; trials by BVI Kelp on collection and drying methods.

Other issues surrounding use:

- Concern about scalability of usage options due to small size and limited resources in OTs. Montserrat participants felt especially disadvantaged.
- There's a pressing need for increased collaboration among Overseas Territories (OTs) to overcome these constraints collectively.
- Identifying suitable locations for drying and storing sargassum is crucial, with a focus on areas with low heavy metal leaching. The limited availability of public land in the Virgin Islands exacerbates this challenge.
- There is need for an accessible database of methods and extraction techniques to aid usage. Intellectual property restrictions prevent uptake of viable solutions.
- In the Virgin Islands, it was suggested that youth innovation could be encouraged through science fairs and by sharing widely success stories of regional entrepreneurs.
- Government incentives are essential to stimulate private sector investment in research and development by both local and foreign entrepreneurs. The Virgin Islands, for instance, has a Climate Change Trust Fund that could potentially provide seed funding grants to innovators.
- Encouraging innovation through business incubation support for small and microenterprises in the sargassum sector is vital. Participants in the Virgin Islands identified a potential role for the Ministry of Finance and Commerce in promoting corporate social responsibility initiatives that facilitate innovation.
- As sargassum businesses develop, there will be a need for legal clarity regarding ownership of this new resource and potential regulation. Additionally, tax-related implications should be carefully considered. The Ministry of Finance and Commerce in the Virgin Islands was highlighted as a key player in tracking the economic contributions of these businesses.

Session 7: Introduction to SAMS- Adaptive management of sargassum influx threats and opportunities

In her presentation on adaptive management of sargassum influx threats and opportunities, Ms. Richeda Speede provided a conceptual overview of the Sargassum Adaptive Management Strategy. See **Appendix 6** for copies of the Virgin Islands SAMS Volumes 1 and 2.

She emphasized that Sargassum presents both challenges and opportunities, stressing the importance of a balanced and integrated approach that draws from the best practices of both

disaster risk management and adaptive management. Additionally, designing appropriate *institutional arrangements* that are inclusive, participatory, efficient, effective, transparent, and responsive was essential. *Financial aspects*, including funding for monitoring, evaluation, clean-up, and research and development, were also discussed.

Establishing clarity regarding the appropriate actions and responsibilities for each stage in the sargassum influx cycle is of utmost importance. To prompt participants to start considering what would be most effective in Anguilla, the presentation was followed by an exercise.

In the Virgin Islands, participants focused on identifying which agencies needed to be involved during different phases of influx and their roles and responsibilities.

The group outputs are presented below.

Pre-influx stage:

Actors and roles:

- Ministry of Natural Resources - monitor regional forecasts and inform the following key agencies to prepare: The Tourist Board, Port Authority and the Department of Agriculture and Fisheries.
- Civil society organisations with an interest in sargassum should also be informed, including HLSCC and Beyond the Reef.

When sargassum is spotted within the EEZ, the following government authorities should be alerted:

- Government- GIS should prepare public awareness. Civil society should be informed (including through the use of social media).
- DOAF, NRL, NPT, DDM- Track scale and suggest required responses (e.g fishers removing pots or opening panels?)
- Virgin Islands Tourist Board: Prepare product plan -e.g. Will preferred beaches need to be suggested for best visitor experience? Create statements for taxis/ businesses for client services
- Port Authority - Make preparations to ensure continuity of ferry services (e.g. check cleaning equipment and conduct necessary maintenance/repairs)
- Civil society- Awareness-raising, research/ citizen science (capacity building)
- Key civil society organisations: HLSCC and NSO.
- Key private sector stakeholders: Marine Association, Fishers Organisations, the Mobile Company and the Pier Park Authority

Figure 4 Virgin Islands workshop participants engage in group exercise

Influx Stage:

Actors and responsibilities:

- Collaborative management (With different agencies responsible for managing different areas):
    - Beaches- MNRL / National Parks Trust (Baths)
    - Ports – Port Authority
    - Marinas – Private/Self
    - Shoreline – Private Residents

Actions:

- Assessment of impacts using drones and interviews with people on the ground (Stakeholders: Port Authority, Boat operators, Ministry of Natural Resources)
- Collection (Stakeholders: Port Authority/ Groundworks, Contractors/NGOs, Ministry of Natural Resources) – using manual labour and heavy equipment as appropriate
- Disposal (Stakeholders: Contractors/ Heavy Equipment Operators, Groundworks, Community Volunteers)
- Experiments
    - Ports and Groundworks Team for clean-ups
    - Community volunteers/civil groups/NGOs
    - Research on [the impacts of] sinking
- Participatory monitoring
    - Data repository/ App to register complaints, reports, potential use of social media
    - Collect data and share information regularly
    - Community feedback and involvement
    - Create and adjust plans

The group highlighted that there is currently capacity to deal with low volume influxes however there is a need for more funding. This can be addressed if information is collected on the full economic impacts.

Post-Influx Stage:

Actors: Health Services, Solid Waste Management, Ministry of Natural Resources, Small Businesses. Non-profits, Community residents, Media/Journalists

Research questions/ priorities for monitoring:

- Rate of decomposition – To make the case that you don't always have to remove
- When is the best time to remove sargassum?
- Best collection methods for different areas
- Cost of different approaches
- Impacts on benthic communities/ nearshore environments
- Health impacts
- Loss of revenue/ economic value

Actions:

- Debriefing exercise with key stakeholders
- Database generation – Responsibility of Government
  - Creation of a cost-benefit database for various sargassum interventions (beach clean-up versus deflection/ in-water skimming versus no-action)
  - Creation of list of approved personnel to clean-up sargassum (i.e. heavy-equipment operators who have undergone requisite training in best practices)
  - Survey of nearshore and benthic communities and note any changes post-influx
  - Assessing types of clean-up mechanisms and their efficacy versus the "no clean-up" option. This would help determine the best equipment for local conditions and best timing to deploy these. {This information would contribute to development of a Virgin Islands- specific Standard Operating Procedures for managing sargassum}
  - Interviewing stakeholders (i.e. businesses, tourists, coastal residents) to determine economic impacts (positive and negative)
  - Results of drone mapping, water quality testing
- Education/Empowerment/ Awareness – Responsibility of government and civil society
  - Training of heavy equipment operators
  - Press releases for public awareness of influx and management measures
  - Communicating with media on results of monitoring/studies
  - Empowering communities to take action in cleaning/ take responsibility for their communities
  - Best management practices/protocols

Figure 5 shows the proposed relationships between the different stakeholders during the post-influx phase developed by workshop participants.

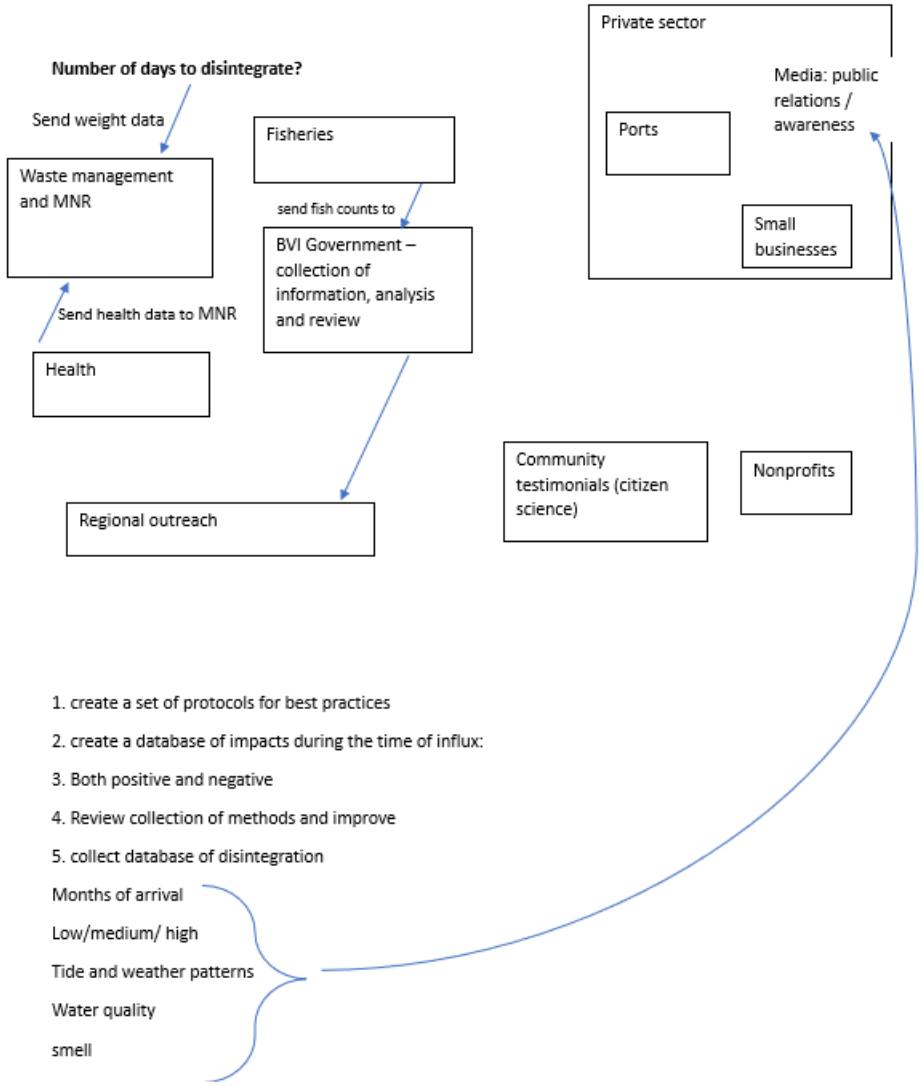

Figure 5 Proposed stakeholder roles and relationships during the post-influx phase in the Virgin Islands

Key learnings from this session across the three territories included:

- The need to clarify institutional responsibilities and to identify a lead agency who will be responsible for coordination. (The public should be aware of these responsibilities);
- The importance of leveraging existing resources and capacities;
- The need to develop standard operating procedures (SOPs) and triggers for different levels of response; and
- The importance of reflecting on what worked and what didn't during the post-influx phase and adapting institutions and SOPs as necessary.

Session 9: Delivering participatory process: stakeholder engagement and communications for management

This session highlight the importance of effective stakeholder engagement and communications to enable participatory sargassum management. In her framing presentation, Ms. Belmar pointed out that communication could serve various purposes including awareness-raising, mobilization for action and for advocacy (wanting to influence or change policy, processes, etc.). You therefore need to be clear on what your goal or objective for communication is and who you are communicating with (i.e. your target audiences).

Participants in the Virgin Islands wanted to change perceptions about sargassum and to generate buy-in from a cross-section of stakeholders to share responsibility for its management. The Government has previously run successful Sargassum awareness campaigns and produced infographics (See Figure 6) which can be utilized in subsequent communications efforts.

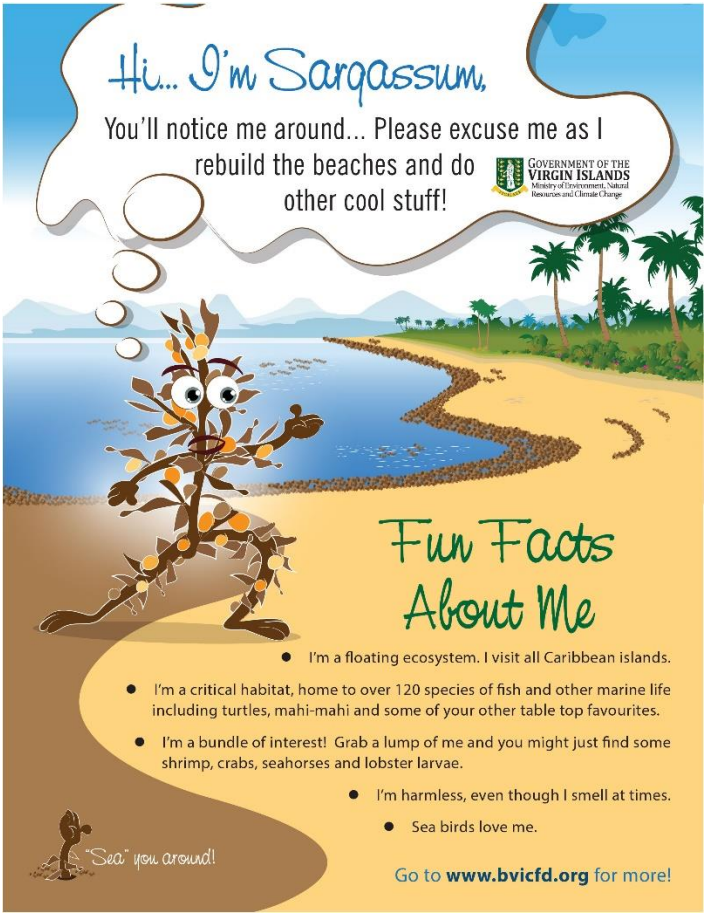

Figure 6 BVI Sargassum Infographic

Error! Reference source not found. outlines the communications priorities discussed by participants in their brainstorming session.

Table 1 Priorities for Communications on sargassum management in the Virgin Islands

Objectives	1. Public to understand government action 2. Understand who is responsible for sargassum management (i..e roles of different government agencies, civil society and private sector actors) 3. Enable MNR to lead and coordinate responses 4. Attitudes and perceptions about sargassum, including seeing the opportunity
Target audience	• Sea cows bay community • Key messages • Health effects (to be crafted by MOH)
Pathways	• Community meetings • Social media • Radio • Senior groups • Churches • Schools
Engagement strategies	• Social media • Group charts • Community volunteer • Social corporate responsibility

Key learnings from this session across the 3 territories included:

- The importance of communicating the relevance of sargassum to interests of stakeholders across sectors;
- The role of citizen science in both monitoring and awareness-raising;
- The importance of face-to-face meetings with key stakeholders to get their buy-in; and
- The opportunity to leverage free resources such as radio interviews and government information services to disseminate messages.

Session 9: Closure and next steps

To close the workshop, Ms. Belmar thanked the staff of the Ministry of Natural Resources, Mr. Louis Potter, local mobiliser and participants for their cooperation in delivering a successful workshop. She explained that explained that over the next year the project will be provide technical support for implementation of the SAMS and PRAM and engaging in practical awareness raising exercises.

Before leaving, participants completed a workshop evaluation, the results of which can be seen in Appendix 7.

Appendices

Appendix 1	Original agenda
Appendix 2	Participants list
Appendix 3	Presentations
Appendix 4	Photos
Appendix 5	Participatory Research and Monitoring (PRAM) Framework
Appendix 6	Sargassum Adaptive Management Strategy (SAMS)
Appendix 7	Evaluation Report