CAST

Caribbean Alliance for Sustainable Tourism

A CARIBBEAN HOTEL & TOURISM ASSOCIATION INITIATIVE

CARIBBEAN HOTEL & TOURISM ASSOCIATION

Sargassum

A Resource Guide for the Caribbean

Sargassum on a Caribbean beach, June 2015
Photo Credit: Horst Vogel, Head of Programme of CATS

PREFACE

The Caribbean Alliance for Sustainable Tourism (CAST), an initiative of the Caribbean Hotel and Tourism Association (CHTA), alongside Strategic Partner OBM International (OBMI) have partnered to create ongoing information regarding the sustainability of the Caribbean Region.

Notably, through the work of Ms. Isabella Fiermonte, CAST Intern from the University of Miami, the collective leadership of CAST, CHTA and OBMI the following Resource Guide was developed.

The Guide is intended to serve as an initial resource for the Caribbean, in particular to inform the tourism industry, local governments, environmental groups and residents about Sargassum seaweed, its impact and uses, and best practice mitigation and management measures which are being undertaken. Provided this is a new and natural occurrence, there are ongoing studies on the tracking, use, effects and mitigation of Sargassum seaweed. The following pages seek to provide additional information to further educate the tourism sector and other stakeholders.

About CHTA

The Caribbean Hotel & Tourism Association (CHTA) is a federation of 32 National Hotel Associations with more than 600 member hotels and over 300 allied members. CHTA is the largest representative of the private sector in the Caribbean hotel and tourism industry. It is the voice of the Caribbean hospitality industry. Today, tourism is widely recognized as a pivotal industry in the economy of the region – and CHTA functions as the common denominator for this industry in a region of diverse geography, nationalities, languages and styles, identifying mutual problems and marshaling the resources of the active and allied members to devise solutions. In 1997 CHTA formed the Caribbean Alliance for Sustainable Tourism to address issues and advance initiatives and solutions on sustainable matters important to the industry.

About CAST

The Caribbean Alliance for Sustainable Tourism (CAST) serves to meet the needs of the region's hotel and tourism enterprises by providing quality training mechanisms and information and resources related to sustainable tourism; promoting the industry's efforts and successes to the traveling public; and serving as a vital link to all stakeholders with sustainable tourism interests in the Caribbean region. With a focus on providing tangible results to tourism enterprises through environmental management as sustainable tourism support. Through the development of synergies and strategic partnerships with existing sustainable tourism efforts ensure a cohesive solution to advancing the sustainability agenda within the region.

About OBMI

OBMI is a global leader in architectural design with an experienced team of professionals who are passionate about the creation of successful places. At OBMI we believe that architectural design and planning is a privilege and an opportunity for greatness. We enter every project with a great respect for its site, understanding that only with the utmost sensitivity to its natural environment, culture and history will a site become a place with a story and a soul. As a Strategic Partner of CHTA and serving as the Technical Director for CAST, our work focuses on the constant pursuit of sustainability-based resources for the places where we work. Celebrating over 75 years of passion for our profession, we serve our worldwide clients through five Centres of Excellence, each specialising in strategic business sectors: Destination Creation, Urban Lifestyle, Island Living, Inside Design and Green Matters.

Outline

Facts **4**
- What is It 4
- Causes 4
- Perception vs Reality 5
- Potential Uses 5

Sargassum's Potential Impact on Tourism **6**
- Guest Perception & Reaction 6
- Guest Relations, Public Relations & Media Management 6
- Sea-Based Tours & Diving 7

Schools of Thought on Mitigation and Management **8**
- Best Practices 8
  - Private Sector 8
  - Public Sector 10
- Grants as a Resource for Mitigation 12

Next Steps **12**

Appendix **13**

Facts

What is it?

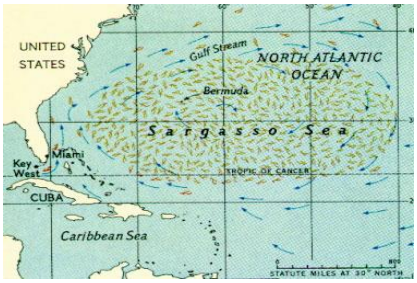
Sargassum is a species of brown algae. There are two species commonly found in the Caribbean, **s. natans and s. fluitans** (see image). It is free-floating seaweed and will not attach to the ocean floor; its movements depend solely on ocean currents. An essential habitat for over 250 species of fish and invertebrates, while it seems to create an annoyance, it is integral to marine life. They use it as nurseries, feeding grounds, and shelter. Sargassum can also be extremely important to particular endangered and migratory species like sea turtles and whales.

Two species of Sargassum
http://www.usm.edu/gcrl/Sargassum/Sargassum.identification.guide.php

Causes

The excess of Sargassum washing up on beaches in the Caribbean originates from the Sargasso Sea, located in the open North Atlantic Ocean near Bermuda. This sea stretches 1000 km wide and 3200 km long and is estimated to hold up to 10 million metric tons of Sargassum (see image below). It is known as "the golden floating rainforest". It is also found in the Northern Gulf of Mexico. Scientists suggest that **the influx of Sargassum in the Caribbean is due to a rise in water temperatures and low winds,** which both affect ocean currents. In essence pieces of the Sargassum are becoming entrained in currents which head towards the Eastern Caribbean Islands. These factors and the spreading of Sargassum has been linked to increased nitrogen loading due to **pollution of the oceans** through human activity of increased sewerage, oils, fertilizers and **global climate change.**

Because this problem has arisen quickly (within the past five years or so), new information is constantly being uncovered. Scientists at the University of Southern Mississippi have even come up with a new theory about Sargassum's origins in the Caribbean. Some believe that it was brought into the Eastern Caribbean through the North Brazil Current and because it thrives in warm, nutrient-rich water, the Sargassum simply spread throughout the region. It has also been reported that the influx of Sargassum may also be attributed to oil spills five years ago which occurred in the Gulf of Mexico, where Sargassum was widely found. As a result of the damaging conditions within the Gulf, through currents, increased amounts of Sargassum have been transported into the Atlantic and disperses. Dr. Lapointe of Florida Atlantic University shares this perspective and contributes the influx of Saragssum being due to the clean-up efforts of the oil spill. There may not be one source of the Sargassum and until more concrete information is provided, scientists may only provide theories as to where it comes from and why it is spreading so quickly. ***Read more about new theories and information through the links in Appendix 1.***



Sargasso Sea Map
http://www.bibliotecapleyades.net/ciencia/esp_bermuda_04.htm

Sargassum is generally harmless to humans and other animals when it originates within a natural un-polluted habitat. When it washes ashore it provides food for many beach-dwelling birds and invertebrates. However, as small organisms within the seaweed start to die and it begins to decompose, it gives off a rather

unpleasant smell. This can occur within as little as 1 day or longer, dependent on the type of organisms within the Sargassum.

Perception vs Reality

Beach goers are going to have a hard time accepting Sargassum for what it is. Many will view it as a nuisance but which doesn't contribute to a pleasant coastal vacation experience, but the fact of the matter is that it is a natural occurrence and is generally Mother Nature at work. This does not mean that we have to sit back and allow it to take over the beaches. It has a variety of uses when tested to ensure non-contamination and can be taken off beaches in a responsible manner, which will be explored further in Mitigation and Management.

Potential Uses

Sargassum is an excellent medium for use as landfill. It can be used to build up dunes and beaches to combat the threat of beach erosion. Sargassum also has incredible potential to save money for islands' agriculture sector. It is increasingly being used as **fertilizer and compost**. As long as it is properly cleaned and dried it contains many useful nutrients that promote healthy soil and help with weed control. Sargassum can be incorporated into any **composting system** you currently have in place. For use within compost, it is best to place the Sargassum in a loosely sealed container with equal amounts of water and allow for the mixture to sit for approximately two and a half to three months prior to application.

If considered for use as fertilizer, large quantities should be used to achieve the correct mix of nutrients. Provided the Sargassum contains high salt/sodium levels, it is suggested that the substance be leached prior to application. This can be achieved through spreading the Sargassum out 1-2 inches thick and allowing continuous rain or watering of the substance per inch.

Alternatively, in-vessel compost systems are highly efficient and large but also expensive. They work well for large operations that spend a lot on food scrap disposal. Smaller systems built for at-home use work perfectly well if you don't need to create much compost or lack the space for an in-vessel. ***Find more information about in-vessel composting in Appendix 2. There is also a link to a video in the Appendix 3 that shows one man's process of turning the Sargassum into fertilizer.*** It is a cheap and plentiful alternative to expensive fertilizers and it is 100% natural and sustainable. It can also be incorporated into gardens and small-scale projects for residences and hotels.

Organic mulch made of Sargassum
http://www.gisbarbados.gov.bb/index.php?categoryid=13&p2_articleid=6479

Ministries of Agriculture should be contacted to run tests on the Sargassum to ensure there are no contamination factors and better understand the correct nutrient content and appropriate techniques for uses within agriculture, as the above may vary by island.

In addition to the above, some people have even **incorporated Sargassum into their cuisine**. Seaweed is often used in Asian-inspired dishes and has a somewhat bitter taste that many people enjoy. Before preparing it as a dish it must be tested and thoroughly rinsed. Some Sargassums can be cooked in lemon juice or coconut milk and served alone or as a side to meat and fish. However, the most popular way to

serve it is to fry it quickly and then let it simmer in water with soy sauce and other ingredients between thirty minutes and two hours depending on your preference and the dish. ***You can find an article about more ways to prepare Sargassum in Appendix 4.*** It should be noted however, that Sargassum may in fact have entangled debris within it, as such precautions must be taken to remove the debris.

Sargassum's Potential Impact on Tourism

Guest Perception and Reaction

Although Sargassum poses no threat to human life, it is usually not a welcome sight, or smell, on Caribbean beaches. The amount of Sargassum landing on beaches is entirely dependent on location and prevailing currents. The south and east sides of islands tend to see a lot more Sargassum than the north and west sides. A web program created by the SEAS program provides a **"Sargassum weather report"** that may assist with predicting when and where the Sargassum may potentially be. The University of South Florida also provides links to satellite data to help track sargassum movement over time. ***Further information about this program may be found in Appendix 5.*** This tool will help you better prepare and let tourists know what to expect. ***The University of Southern Mississippi has provided an online reporting site should you wish to report Sargassum in your location, there is a link to this in Appendix 6.***

In addition to disrupting the beauty of the beaches, Sargassum also tends to give off an unpleasant odor. If left in the sun for a couple days it will begin to decompose. As it decomposes it can begin to smell and turn black and brittle. It is important to remember that it isn't the Sargassum that gives off a bad odor. It is the tiny organisms and fish that get caught within it. That is what guests are smelling. Depending on the type of organism, the decay rate may vary.

When experienced in large, continuous amounts, Sargassum poses serious threats to the tourism sector when education about Sargassum is lacking and limited resources for mitigation are available. This results in lack of beach access, increased cost for consistent removal, inability to operate tours and ocean-based activities near the beach shores/coastlines. In severe cases, vacation cancellations and beachfront room closures have occurred, leading to staff layoffs and reduced economic gain for the sector and communities.

Guest Relations, Public Relations and Media Management

The first step to properly dealing with Sargassum is to assure your guests that it is not harmful. It does not sting or contain any severe threat to human health. Providing guests with as much information as possible is important. ***For example, you could provide quick fact sheets about the seaweed (see Appendix 7).*** Sargassum is actually a very interesting ecosystem and is full of as much life as a coral reef and it's much closer to shore. Let guests know that it is a natural occurrence. If you plan on ridding your beach of the seaweed, let guests know that you will do so in an environmentally sustainable way and as quickly as possible.

Galveston, Texas has been dealing with Sargassum in large quantities washing up on its beaches for a while now. They do their best to remove what they can and ***to please beach-goers they provide fact sheets and buckets for people to go on "Sargassum scavenger hunts" (see Appendix 7).*** Providing an

education experience and adventure for those who are interested to understand and learn more. It was very popular with guests and many viewed the Sargassum quite differently instead of allowing it to become an occurrence which negatively affect their trip to the beach.

Concern has also risen about Sargassum interfering with endangered **sea turtle** nests. While Sargassum makes an excellent hideout for juvenile turtles in the ocean, beach seaweed can often disturb their hike from nest to sea after hatching. The Sargassum can also make it difficult for mother turtles to access the beach to start a nest if it is piled too high. This means that while it is helpful to remove some of the Sargassum, it is best to do so carefully. Manual removal will ensure that no turtle nests are disturbed by heavy beach cleaners. If you know that sea turtles nest on your beach, be sure to check before you start removing the seaweed. This influx in Sargassum on beaches is relatively new and there is limited information available. If you have any questions consider contacting your local turtle watch organization and have them take a look at the situation if you are concerned for turtle safety. ***Widecast, The Wider Caribbean Sea Turtle Conservation Network, has contacts all across the Caribbean and their information is located on their website which can be found in Appendix 8 at the end of this guide.***

Sea turtle hatchling utilizing Sargassum in the open ocean.
http://www.blogthebeach.com/2010/nature/turtle/where-do-florida-sea-turtle-hatchlings-go

Sea-Based Tours and Diving

There has been concern that Sargassum may affect other activities relating to tourism in addition to disrupting the beaches. While close to shore, the seaweed makes it very difficult to swim and wade in the shallow water. However, Sargassum mats in the open ocean make incredible dive sites. They house thousands of small organisms and attract large predators like sharks and whales. Guests with an interest in scuba diving are encouraged to explore these colorful ecosystems as they have been described as equally exciting as coral reefs. Because they are ocean-surface habitats, it is possible to accommodate snorkelers as well as divers to experience the beauty within a Sargassum ecosystem. ***To read more from a diver's perspective, see the link in Appendix 9.***

Dive Site: Sharks & Sargassum
http://www.alertdiver.com/?articleNo=1108

Schools of Thought on Mitigation and Management

The Best Environmental Solution may not work for Beachfront Properties. Some environmentalists may urge managers and owners to leave the Sargassum where it is; that is not possible for most. While Sargassum beaching is totally natural, a quickly warming ocean causes the influx often leading to concern from management and guests. The Caribbean prides itself on its pristine beaches and the Sargassum is not a welcome visitor in such large quantities. There are ways to rid your beach of this unwelcome vegetation without disrupting local wildlife and contributing to beach erosion.

Sargassum Cleaning on a Beach in St. Thomas
http://stthomassource.com/content/news/local-news/2011/08/30/pesky-seaweed-downer-vi-tourism-not-without-benefits

Best Practices by Private and Public Sectors

Many managers' first response is to remove it using cranes and mechanical equipment. When considering, it is important to understand the risks of doing so. Removing Sargassum with mechanical rakes and cranes is going to also remove sand and sand-dwelling critters, including possible sea turtles and nests mentioned previously. Removing it manually if possible is the most sustainable practice. If it is disrupting hotel activities and visitors, it can be taken off the beach and disposed of in a responsible manner. Below, a list of some alternatives and cleaning methods that have proven practical and economical are provided.

Private Sector

- For beaches that experience low volume, many beach managers have found that burying the Sargassum further up the beach provides some relief. Sargassum works as an excellent medium for beach nourishment and can help combat beach erosion; this has also become an issue with the threat of sea level rise. The best way to do so is by manually transporting the Sargassum up the beach with wheelbarrows and checking waste that can get caught within the seaweed. Manual transport is best for low to medium volume amounts because it also allows clean-up crews to be careful of sea turtle nests that are often damaged by mechanical equipment. After the Sargassum is moved it can be buried or mixed in with the top layer of sand. It helps to stabilize the sand and build up the beach. This method will please guests with a clean, Sargassum-free shoreline in a way that does not disturb local wildlife and even benefits the coastal system. With any action, quick steadfast remediation is best.

    - **Pros**: Beach nourishment, won't disturb local wildlife, satisfy guests and will provide a cleaner beach.
    - **Cons**: Manual removal requires labor and costs associated, time consuming.

- For beaches with extremely high volumes, all of the above alternatives will work but sometimes it is not enough. If you feel additional assistance is needed, contact your local government officials to see if they can provide any resources or help with removing the Sargassum.

- Many islands are already taking action to combat the larger volumes of seaweed. CARICOM organized a youth beach clean-up day in Barbados to help with the problem. 150 young people showed up in the morning and before noon they had gathered over 500 bags of seaweed. The

bags were sold to the Sustainable Barbados Recycling Center to raise money for a charitable cause.

Seeing if you can team up with a local recycling center is a great way to get rid of the seaweed responsibly and also earn money from it. Donating the money raised to local non-profits looks great for a hotel's environmental image as well. ***A link to an article about the beach clean-up can be found in Appendix 10.***

The Caribbean Aqua-Terrestrial Solutions Program (CATS) also organized a beach clean-up at Grand Anse Bay in St. Lucia. The goal of their project was to support the protection of endangered Leatherback sea turtles. The CATS program's primary goal was to monitor Sargassum build up on the beach to make sure it was not interfering with hatchling survival in addition to inspiring the local community to be more involved with sea turtle conservation. ***Read more about their program and project in the link provided in Appendix 11.***

  - **Pros**: volunteer labor, gets the community as a whole involved, benefits a charitable cause, you have power in numbers to tackle the issue.
  - **Cons**: Getting the word out and getting people involved, may not be able to address extremely high volume situations.

- In addition to recycling the Sargassum. It is an excellent medium for growing plants and crops. Consider **partnering with local agriculture**. Because of its high salt content, it also is a deterrent for snails, slugs, and other pests. Establishing a partnership between the tourism and agriculture sector will be mutually beneficial. Local farmers will have a source for sustainable, and nutritious fertilizer and hotels now have a way of ridding their beaches of seaweed in a responsible way.

  - **Pros**: assist local agriculture, get rid of Sargassum in a sustainable way that is mutually beneficial.
  - **Cons**: finding ways of transporting the Sargassum, there may not be a high demand in some areas for fertilizer.

- Setting up a local **"Sargassum task-force"** could be a great way to get the community involved as well. It should be targeted towards young people on the island. Kids from middle school to high school age are always looking for volunteer events and clubs that look great on resumes. Local governments and businesses should be encouraging people to take the matter into their own hands while providing them with information and incentive to do so. Beach clean ups have been widely successful but the key is to get people involved and giving them the desire to help. Have local hotels provide refreshments for anyone who helps or offering rewards to those cleaning up the beaches will give people the push they need to really want to act. Consider having representatives from various sectors

Barbados Workers Union clean up Silver Sands Beach
http://www.barbadosadvocate.com/newsitem.asp?more=local&NewsID=39492

involved in the task force. Encourage government officials and business owners to join. This will impact the local communities as a whole and everyone should be concerned. Tourism is an essential sector in the Caribbean and if it suffers, all islands will feel the effects.

  - **Pros**: have a consistent conversation about the problem, bring more recognition and education of who is affected and why they need to help, assistance to beaches.
  - **Cons**: organization associated with having a task force, getting the word out, support from various sectors due to lack of information/understanding.

- In the US, beach managers have been dealing with Sargassum beaching as well. Beach managers hired companies like Beach Raker and Barber to start spreading and burying the seaweed within the top layer of sand further up the beach away from the shore. This process assures that the Sargassum will not get in the way of sea turtle nests. ***Barber Beach Cleaners runs a blog dedicated to proper beach cleaning methods and resources. Find their site in Appendix 12.***

  - **Pros**: Get rid of the most Sargassum in the quickest way, need far less people to accomplish the same goal.
  - **Cons**: Least environmental option, services are often expensive, equipment rental and purchase is also expensive.

Public Sector

- The **Saint Lucia National Trust** (SLNT) organized a beach clean-up day. Spreading the word to the community is the best way to rid the beaches of unwanted seaweed. The seaweed they collected was then recycled for agricultural projects in the area. They also donated some to schools that will use it as fertilizer in school gardens. In addition to organizing a clean-up, the SLNT also provides small grants to local NGOs, and community-based organizations for conserving and restoring the local environment. Team up with local organizations to help them receive grants and in return have help cleaning the beach. ***Appendix 13 has a link to their grant page.***

  - **Pros**: help local agriculture and schools, earn grants to do your own clean ups, volunteer work.
  - **Cons**: organization, sourcing and applying for the grants, limited effectiveness depending on amount of people involved.

- While **mechanical equipment** is not environmentally sustainable, it is important to know the laws and regulations in your area concerning their use. For example, in Barbados, you must seek permission from the National Conservation Commission/Coastal Zone Management Unit. Be sure to check with the relevant officials to understand the regulations and permissions which may be required within your island.

- Local government should also be educating residents and businesses as much as possible. Having reliable and accessible information is key to running a successful mitigation action plan. If the public is more aware of the amazing benefits that can come from Sargassum, they might be inspired to help. Sargassum presents entrepreneurial opportunities. ***One man in Barbados was***

quick to reap the benefits of the Sargassum beaching and turned it into a profitable business, selling sustainably collected and organic fertilizer. See video in Appendix 3.

- **In terms of government assistance**, identification of sectors to handle the clean-up of the Sargassum and forums to educate should be discussed. The private and governing sectors on islands need to team up to manage and mitigate the impact of this unwelcome seaweed. All sectors will be affected if local solution-based measures are not identified and collective efforts are not undertaken to proactively address the problem. All have a stake so all should be involved in the cause. The best way to get people involved is to educate the public about the issue. Local governments should send information to schools, businesses and residences encouraging people to take pride in their beautiful island and help it to stay that way. National Hotel and Tourism Associations and environmental groups should come together to educate and encourage their members to become involved in solutions.

    - **Pros**: Collective action helps to encourage governments, businesses and communities to leverage their thinking and resources to address the problem.
    - **Cons**: Not everyone will feel the need to get involved. Governments may be slow to respond/act or ineffective in engaging stakeholders to work together in seeking solutions.

- Barbados is not the only government working on a solution. **The Tobago House of Assembly**'s marine division is also working on solutions to eradicate the influx of Sargassum. They noticed that local fishermen were being affected by the Sargassum and were unable to fish in certain places along the shore. In addition, Tobago also requests that any people removing the Sargassum for personal uses should first consult the Division of Agriculture, Marine Affairs, Marketing and the Environment (DAMME). The growing problem is gaining the attention of other Governments, tourism industry officials, environmental organizations and the public throughout the region.

- **The Caribbean Disaster Emergency Management Agency** is currently monitoring the situation. They provide updated information on Sargassum's impact and plan to collaborate with regional specialist agencies to address the situation. ***Their website has a contact list that can direct you to a regional National Disaster Coordinator (NDC), this list can be found in Appendix 14. They also have a 24-hour contact number where they can be reached: 1-246-425-0386.***

- ***While Sargassum is not affecting all beaches and islands throughout the Caribbean, it is presenting a challenge in some areas. In those circumstances with high impact as determined by local stakeholders (i.e. 2 to 4 feet and above in height or a defined metric ton per given area at any time) the responsibility for mitigation, management and clean-up should not fall solely on the hotel or property owners in the areas affected. Government resources and support should be applied at varying levels based beach activity and surrounding amenities. Consideration should be given to declaring a natural disaster area and stakeholders should advocate local and international authorities for disaster mitigation and relief to normalize the situation.***

- Understanding that Sargassum was encountered back in 2011 within the Caribbean, it did not occur in such large quantities, as such, no firm solutions from the public or private sectors were

put in place. At this current stage, greater effort and support by governments for Sargassum should be addressed soonest. With the reported causes and effects of climate change being ever present and an understanding of the rising and warming of the sea levels – it is safe to say – Sargassum may be around in the future. Some islands have reported adverse effects of Sargassum on painted building structures, causing stripping. As a result, this infers further research needs to be conducted to better ascertain its impact. Further input from the scientific arena in partnership with emergency agencies and respective governmental ministries should be established. CHTA recommends that relevant governmental agencies, work collectively with the private sectors and educational institutions to adopt policies and resources to address Sargassum and provide assistance for sustainable remediation and management.

Grants as a Resource for Mitigation Costs

Another possible solution is to **cooperate with local NGOs, charity organizations and non-profits**. The Caribbean Catastrophe Risk Insurance Facility (CCRIF) offers grants to these organizations for projects relating to climate change and environmental management. The projects can range between $5000 and $25000. This offers non-profits a way to earn money for a worthy, sustainable cause. This also helps hotels take care of their Sargassum and it looks great for marketing to be partnered up with local environmental protection organizations. ***See Appendix 15. A database for local NGOs is in Appendix 16.***

In addition to the CCRIF, other programs are working on projects to support legislative reforms and new policies concerning environmental protection and management. The Global Environment Facility (GEF) recently secured nearly US$21 million to assist in the management of resources and ecosystems in ten countries in the Caribbean. This project will support the goals highlighted in the SAMOA Pathway and Sustainable Development Goals (SDGs). This plan hopes to make changes in policy to help protect biodiversity and ecosystems and address climate change and disaster risk reduction. It is possible that sargassum mitigation processes could be considered as projects through the GEF's funding. For more information on GEF and the SAMOA Pathway's goals and action plans see ***Appendices 18 and 19.***

It is suggested that hotels contact their insurance provider to determine Sargassum mitigation coverage.

Next Steps

CAST is conducting a webinar on the issue and solutions for CHTA members on July 21, 2015 at 11:00 a.m. To register go to:
https://attendee.gotowebinar.com/register/5682008178869974273

The webinar's presentation will be available to the public (48 hours after the webinar) at:
http://www.caribbeanhotelandtourism.com/EducationTraining.php

This guide should serve as a resource for assisting National Hotel and Tourism Associations, Government, environmental groups and motivated citizens to come together, perhaps through a task force or special committee to review and assess their approaches and develop plans, awareness and training initiatives to find solutions to the problem. We encourage government and disaster planning agencies to react quickly and engage the tourism sectors to identify and act on solutions and resources.

A great way to further engage our private and public sectors would be to create a Sargassum Forum. More information and unique occurrences can be tracked and solutions actively sought for remediation as every island is experiencing Sargassum in different ways. There are multiple ways by which this can be accomplished, such as:

- A Facebook group within the CAST page to encourage open discussion and the sharing of ideas and solutions to combat the Sargassum together.
- A Twitter chat using a relevant hashtag.
- An online forum through the program "Muut" to start a discussion board. Anyone can login with an email and username and join in to share their experiences, questions and solutions.

Feel free to contact CHTA/CAST with any questions about these or other steps that might help.

Appendix

1. This article outlines a new theory about the origins of Sargassum and its roots in the eastern Caribbean: http://news.algaeworld.org/2015/01/different-look-sargassum-seaweed/
   Dr. Lapointe of Florida Atlantic University: http://www.wptv.com/news/region-n-palm-beach-county/juno-beach/sargassum-spread-of-seaweed-becomes-focus-of-harbor-branch-fau-scientists-study
2. If you would like information on large, in-vessel composters you can visit this website for more information: http://forsolutionsllc.com/in-vessel-composting-costs/
3. This video outlines one man's thriving business based around Sargassum he collects, prepares and sells as fertilizer: https://www.youtube.com/watch?v=6nkRU0-4Kf8
4. This article goes into the uses of Sargassum in cuisine. It includes preparation details and a few different ways to cook the different varieties: http://www.eattheweeds.com/Sargassum-not-just-for-breakfast-any-more-2/
5. If hotels and beach managers, or really anyone interested, want to have an idea of what to expect in terms of Sargassum beaching, there is a website set up by the SEAS Program to do just that. This resource provides updated information about when and where Sargassum is going to be. It's like a weather channel for seaweed. http://seas-forecast.com/index.php The University of South Florida's satellite link can be found here: http://optics.marine.usf.edu/cgi-bin/optics_data?roi=ECARIB&current=1
6. Report your Sargassum: http://www.usm.edu/gcrl/sargassum/sargassum.observation.form.php
7. Sargassum Fact Sheet: http://sero.nmfs.noaa.gov/habitat_conservation/documents/pdfs/hcd_pdf/gcfisargassumfactsheet_2015.pdf
8. For any questions about sea turtle protection. Contact your local turtle conservation organization or visit the website provided for Widecast to contact one of their contacts close to you: http://www.widecast.org/Who/Contact.html
9. For more information on a diver's perspective on sargassum, see this link: http://www.alertdiver.com/?articleNo=1108
10. Article about CARICOM's youth beach clean-up day found here: Article: http://www.barbadostoday.bb/2015/06/14/youth-battle-Sargassum-seaweed/

11. This link will guide you to the Caribbean Aqua-Terrestrial Solutions page and article about their beach clean-up to remove Sargassum from Grand Anse Bay to protect endangered sea turtles: http://caribbeancats.org/index.php/saint-lucia/turtle-conservation/
12. Barber Beach Cleaners has a website/blog dedicated to information concerning the use of beach cleaning machinery. You can visit their site: http://www.beachcleaner.com/ to learn more about the equipment and their uses.
13. The St. Lucia National Trust provides grants similar to CCRIF for projects concerning environmental stewardship and protection. The link to SLNT's website and grant program is as posted: http://www.slunatrust.org/programmes-projects/pp-gef-sgp
14. To contact a local National Disaster Coordinator with the Caribbean Disaster Emergency Management Agency use this link: http://www.cdema.org/index.php?option=com_content&view=article&id=362&Itemid=202
15. The CCRIF provides grants to NGOs and charity organizations for projects concerning adapting to environmental climate change and protection. Sargassum beach clean ups and responsible disposal could possibly be a candidate for such grants if hotels and businesses partner with local non-profits. Below is their website for reference: http://www.ccrif.org/content/programmes/small-grants-programme
16. If you are looking to partner with local NGOs and non-profits but don't know where to start, this website provides a database of many in your area: https://www.guidestar.org/NonprofitDirectory.aspx
17. A Cayman Islands news team provided a video educating property owners on what Sargassum is and how to responsibly get rid of the excess algae washing up on beaches. http://www.cayman27.com.ky/2014/11/17/environment-break-Sargassum-seaweed-in-caymans-water
18. This link provides an article outlining the GEF's program to fund efforts laid out by the SAMOA Pathway: http://caribbeannewsservice.com/now/caribbean-sids-to-benefit-from-new-gef-project/
19. To read the outcome statement from the SAMOA Pathway please visit: http://caribbeannewsservice.com/now/caribbean-sids-to-benefit-from-new-gef-project/

For additional information about CHTA and CAST contact:

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