



BELIZE SEAWEED INDUSTRY

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INTRODUCTION TO BELIZE

Belize, a cozy place that nurtures endless possibilities...

Nestled amidst the Caribbean and Central America with 8,867 square miles, Belize is a unique, vibrant country with British colonial history. It consists of hard-working, diverse, friendly, bilingual (with English being the official language), and a well-educated workforce that bolsters an economy focused on growth. Belize has a 386 kilometers (240 miles) Barrier Reef facing the Caribbean Sea, the second largest coral reef in the world and the largest in the western hemisphere.

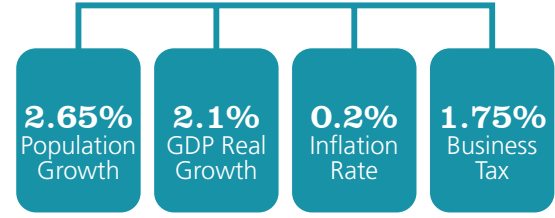


Land Area: **8,867 sq. miles**



Population: **406,262**
 Population Density: **45.9 per sq. mile**
 Labour Force: **178,499**
 Minimum Wage: **\$1.65/hr**

Statistics



9.30%
Weighted Average Lending Rate

1.2%
Weighted Average Deposit Rate

\$3,534
GDP Per Capita



Average Cost of Electricity per Kwh
\$0.18



Average Cost of Water
\$4.36 (0-1,000 gals)
\$52.90 (7,000 gals)

GLOBAL SEAWEED INDUSTRY

The global Seaweed Mariculture Industry is a rapidly expanding and evolving multibillion dollar industry with significant growth opportunities for domestic and export food, and feed sectors, as well as large scale industrial applications in pharmaceuticals, cosmetics, bioenergy, nutraceuticals, alternative packaging, agronomic applications, and others. Over the decades, it has evolved from an industry dominated by wild harvesting to an industry dominated by cultivated seaweeds. These cultivated seaweeds consist of two main taxa (Eucheuma and Gracilaria: Rhodophyta) and are used primarily in the hydrocolloid industry. Together, both seaweeds account for approximately 50% of the global volume, thereby representing a significant share of the global market. The health foods and nutraceutical industries, however, are showing a growth trajectory due to health-conscious individuals across the globe. Testing has been conducted on Belize's seaweed with promising results of low levels of heavy metals and contaminants. These developments present a key opportunity for countries like Belize that are producing high-quality edible seaweed, to market their seaweed as a differentiated premium product as compared to those produced by their Asian counterparts.

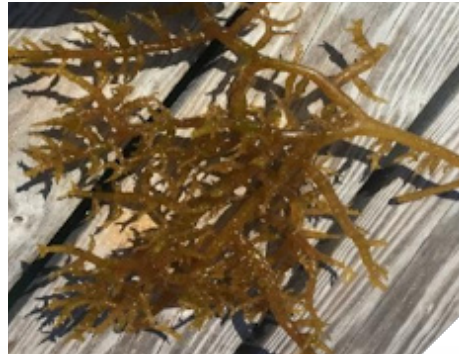
BELIZE SEAWEED INDUSTRY

Fishing has long served as an important source of both food and income for many coastal communities in Belize. With the world's stock of traditional fisheries products such as conch, lobster, and shrimp on the decline due to over exploitation and destructive fishing practices, many fisherfolk have been searching for an alternative source of livelihood. For many, seaweed is providing a viable solution to this dilemma. The seaweed (*Euचेuma isiforme* and *Gracilaria crassissima*) in

Belize is farmed at very low densities in shallow clear coastal waters, producing a high-quality product while providing benefits to the ecosystem. Fisher group associations involved in the seaweed industry include the Placencia Producers Cooperative Society Limited and Turneffe Seaweed Growers Association; having received the proper training to cultivate and harvest seaweed.



Euचेuma isiforme cultivation at Hatched Caye. © Wilbur Dubon | TNC



Unknown species found at Little Water Caye; variant of *Euचेuma*. © Wilbur Dubon | TNC



Gracilaria crassissima cultivation at Little Water Caye. © Wilbur Dubon/TNC

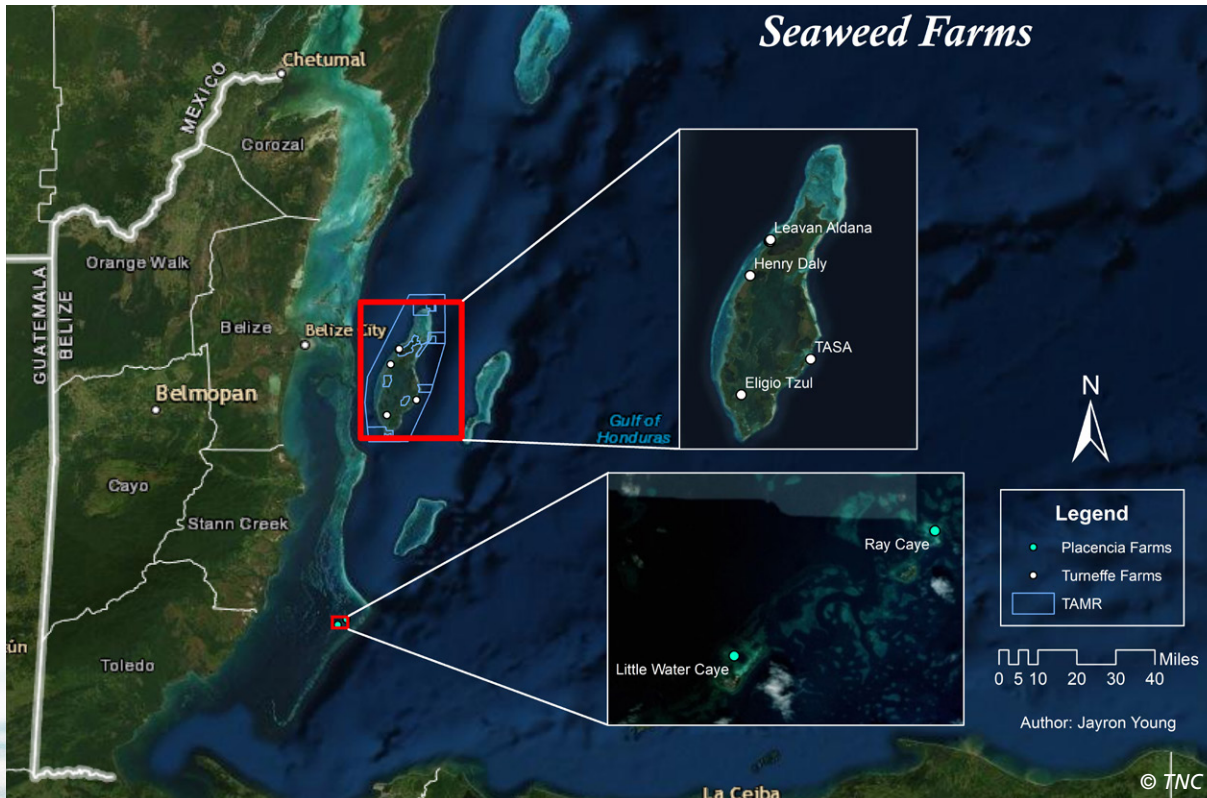


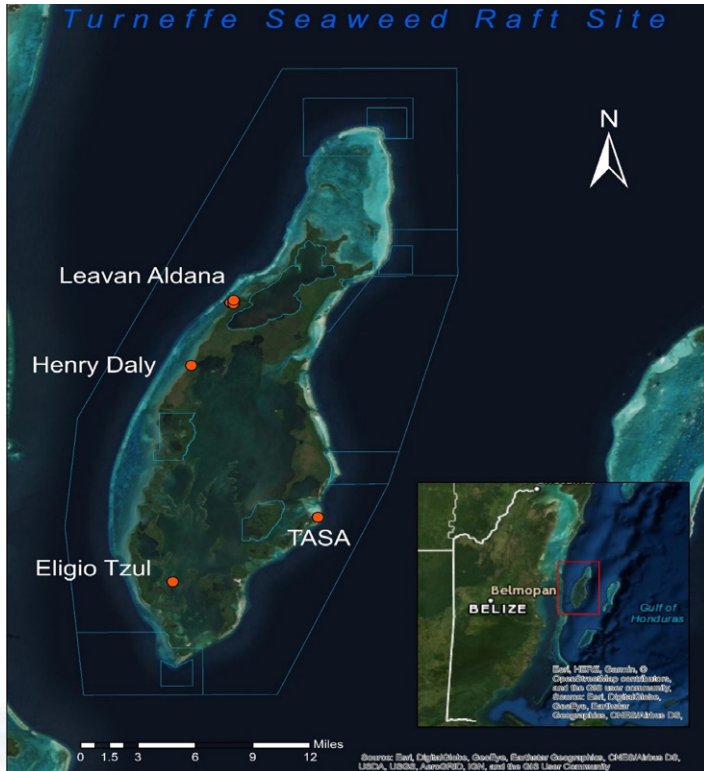
MAIN GEOGRAPHIC AREAS OF PRODUCTION IN THE COUNTRY

The main geographic production area in the country is southern Belize, near Gladden Spit and Silk Cayes Marine Reserve/Little Water Caye (LWC). The new area being developed is located in the north-western portion of the Turneffe Atoll Marine Reserve (TAMR; Soon to be the entire marine reserve). The ecosystem type is much different in TAMR than at LWC, with higher densities of seagrass, greater sheltering due to presence of reef formations, higher quantities of mangrove islands,

larger quantities of fishing camps and fishers, among others. Noteworthy is that the TAMR site is relatively close to the Port of Belize, while the LWC site is relatively close to the Big Creek Port. Expansion is now occurring in TAMR and will advance to other areas from 2020 onward. Although they are considered different geographic regions of the country, the coastline of Belize is only 240 miles long, meaning the regions are in proximity to each other.

SITE LOCATIONS





Turneffe © TNC

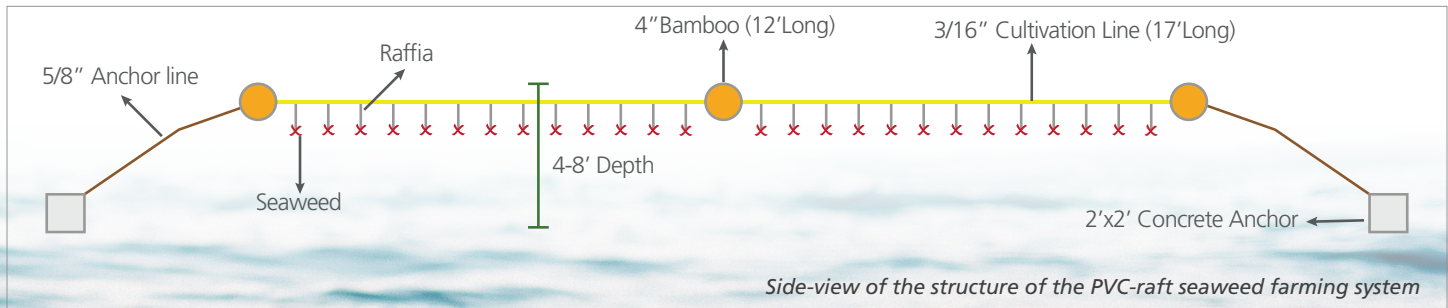
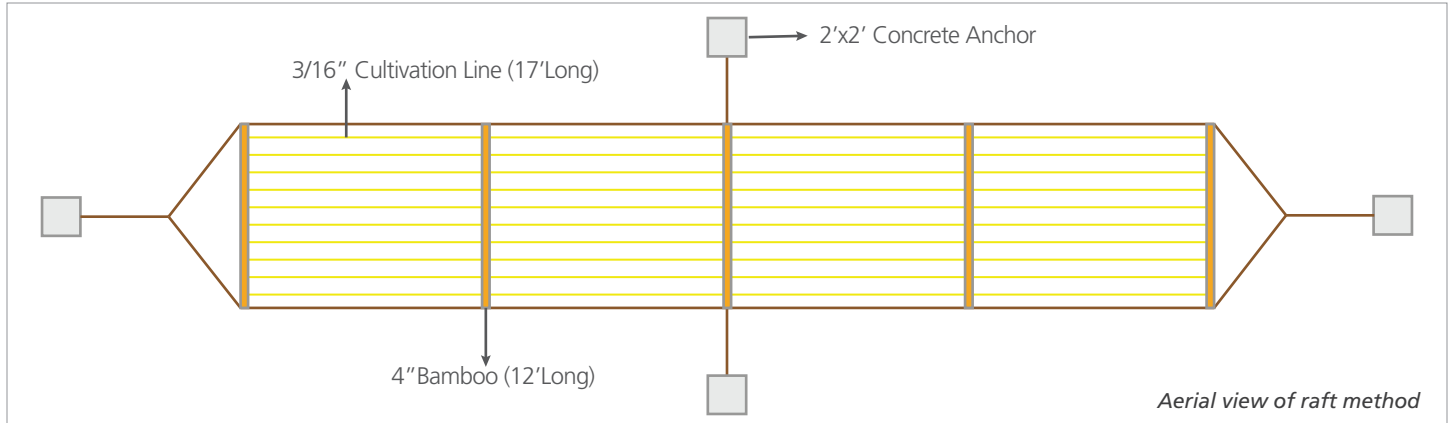


Little Water Caye © TNC

FARMING METHOD

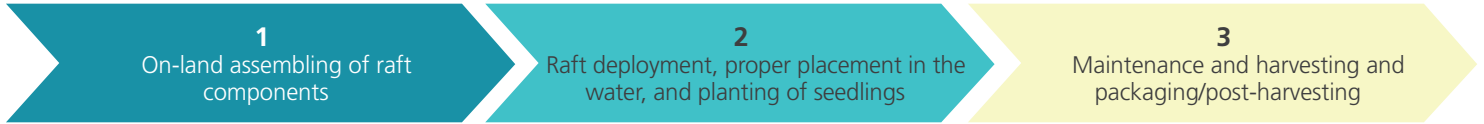
Raft Method

The current production method used in Belize is the floating PVC raft. The typical set-up is detailed below:

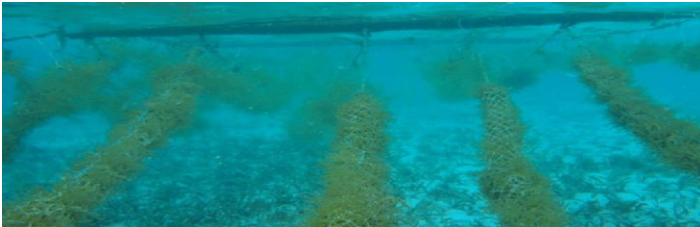


RAFT SET-UP

The set-up of the farm typically occurs in three main phases. Careful attention must be given to each component of each stage to ensure that the four considerations in sustainable seaweed cultivation are adhered to.



Other Methods that are currently being experimented on are the Tubular net and Twisted Rope Method (below).



Tubular Net Method- The tubular net method entails evenly distributing seaweed seedlings in a 17ft. length of polyethylene tubular net and fastening the net to a floating bamboo or PVC raft using 3/16" polyethylene rope.



Twisted Rope Method – The twisted rope method entails braiding at least 80 grams of live seaweed seedlings between the strands of a three or four-ply polypropylene rope.



MAIN SEAWEED PRODUCTS IN BELIZE

While the Seaweed industry in Belize is still in its nascent stage the entrepreneurial efforts and drive is already evident and has resulted in the following basket of products.

- Packaged Raw Seaweed (wet and dry) - sold either as wholesale or retail.
- Seaweed Beverages- unflavored, flavored (nutmeg, vanilla, honey, raisins, and peanuts) to name a few.
- Seaweed Ice cream- flavored and unflavored.
- Seaweed Dishes- salads, sushi dishes, porridge or risotto (rice cooked in a meat, fish or vegetable broth to a creamy texture).
- Processed Seaweed Gel- to tone the skin; to reduce wrinkles; to use as a detoxifier and as blends for aromatherapy for the muscles and joints.
- Seaweed spa and beauty products (for hair and skin)

PLAYERS/FARMERS

Placencia Producers Cooperative Society Ltd (PPCSL)

The Placencia Producers Cooperative Society Ltd was formed in 1962 and traditionally harvested lobster, conch, and fin fish, and at the height of their processing activity had over 100 members and 24 employees, many of them women. The co-op was central to village life and supplied electricity to the village of Placencia until the 1990s.

Due to the decline in fishing yields the Placencia Co-op has suffered low income. To counter this problem, the Co-op is constantly finding innovative, sustainable alternatives to fishing. One of such alternatives is “Sustainable Seaweed Farming”. With funding from various donors, the Co-op has been able to create seaweed farms and, at the same time, process the dried seaweed product to sell to the local and international market.

Turneffe Seaweed Producers

The Turneffe Seaweed Growers was formed on the 2nd December, 2015 and is registered as a business pursuant to the Business Names Act, Chapter 247 of the Laws of Belize, Revised Edition 2003. They currently farm seaweed from the Turneffe Marine Reserve and work with 11 farmers in the area. Some members have previously received training in seaweed cultivation and primary processing.

Belize Women’s Seaweed Farmers Association (BWSFA)

The Belize Women’s Seaweed Farmers Association was officially registered on July 8, 2019 after being unofficially formed in January 2019. The women, after formally meeting at a seaweed cultivation training, saw the potential of working together to strengthen the community of Placencia in which they reside.

Presently, the members of BWSFA are establishing a seaweed farm at the Hatchet Caye site, an area formerly being used by the Placencia Coop. They are also working on developing two value added products from seaweed, seaweed powder and seaweed gel. These products will be sold locally in their community of Placencia within the local businesses and resorts.

THE WAY FORWARD

The Belize Trade and Investment Development Service (BELTRAIDE), The Nature Conservancy, the Belize Fisheries Department, and the Turneffe Atoll Sustainability Association (TASA) continue to work with fisherfolks and other partners in the development of the industry. The aim is to formally establish this sustainable industry with proper regulations for seaweed farming and cultivation, and to further promote entrepreneurship through value chain upgrading.

Additionally, it is expected that linkages along the value chain will allow for provision of fresh and processed products to local, regional, and international markets. This will require improvement of the enabling environment and facilitation services that builds production know-how and capacity as well as trade and commercialization support.

SEAWEED FACTS

- Seaweed is rich in vitamins, minerals, and fiber, and can be tasty. For at least 1,500 years, the Japanese used a mixture of raw fish, sticky rice, and other ingredients in seaweed called Nori; the appetizing result is a sushi roll.
- Many types of seaweed contain anti-inflammatory and antimicrobial agents. Their known medicinal effects have been legion for thousands of years; the ancient Romans used them to treat wounds, burns, and rashes.
- Certain seaweeds do, in fact, possess powerful cancer-fighting agents that researchers will eventually prove effective in the treatment of malignant tumors and leukemia in people.
- Among their many uses in manufacturing, they are effective binding agents (emulsifiers) in such commercial goods as toothpaste and fruit jelly, and popular softeners (emollients) in organic cosmetics and skin-care products.



GROWING SEAWEED TOGETHER



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