Shifting Tides for Traditional Belizean Fishers – Seaweed Cultivation

El Cambio de las Mareas Tradicionales de Pescadores Beliceños – El Cultivo de Algas Marinas

Décalage des Marées Pour Les Pêcheurs Traditionnels Bélizéen - Culture d'Algues

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EXTENDED ABSTRACT

Introduction

Belizean fishers have historically been involved in traditional fishing; however, due to decreasing fish-stocks, many are now involved in the farming of *Eucheuma isiforme* and *Gracilaria spp*. While the fisheries statistics for 2014 - 2015 shows similar production levels to previous years, the number of fishers have increased year over year. The number of fishers increased from 1,300 in 2004 to just over 3,000 in 2013 (B. Wade, Administrator, Belize Fisheries Department, *Pers. comm*.). Therefore, it requires twice as many fishers to catch the same quantity of marine products, which also means that fishers catch only half what they would normally catch. This figure does not account for Illegal Unreported and Unregulated (IUU) fishing which further contributes to the depletion of fish stocks. In many instances in southern Belize, fishing is poor to the extent that the catch is only sufficient to cover fuel and other direct expenses. In order to take home a profit, many fishers harvest *E. isiforme* from Glovers Reef, dry it and sell it on the local market. For some fishers of the Placencia Producers Cooperative Society Limited (PPCSL) in Placencia Village, it became the norm to harvest seaweed to supplement their income. However, the fishers realized that the wild harvesting of seaweed was unsustainable and would result in the depletion of the wild stocks. It was the fishers themselves who sought sustainability of the ever-developing seaweed industry through seaweed cultivation. While they have received financial and technical support to develop the industry, there have also been setbacks.

Objectives

The primary objective of this study was to discuss the advancements and setbacks in seaweed farming in southern Belize from 2009 to 2016.

Methodology

The PPCSL and the Global Environment Facility Small Grants Programme (GEF SGP) in Belize provided project information directly to the researcher. In addition, semi-structured interviews were conducted with seaweed farmers of the PPCSL. All data collection and interviews were done in Placencia Village, situated on the east coast near the Stann Creek – Toledo District border. Data was analyzed and a timeline of activities were developed, and expanded on.

Results and Discussion

The level of interest by fishers in seaweed cultivation as an alternative livelihood program continues to increase every year and has resulted in many workshops, proposals and developments over the past few years. It began in 2005 when the World Wildlife Fund conducted a workshop in Placencia Village on seaweed farming with instructor Alan Smith from St. Lucia. While the workshop was inspirational, the financial limitations of the PPCSL meant that the concept would have to be left on the back burner until funding became available. As the catch per unit effort (CPUE) continued to decrease over the next four years, fishers were once again seeking alternative livelihood projects. In 2009, the concept of seaweed cultivation came up once more. With potential funding available from the Global Environment Facility Small Grants Programme through the Community Management of Protected Areas for Conservation Programme, implemented by the United Nations Development Programme (UNDP), the PPCSL began working on a proposal for a planning grant. A grant of US$5,000.00 was approved and work began on a proposal for seaweed cultivation. The proposal for US$45,000.00 was approved in August of 2010 and funding began thereafter for the procurement of equipment and other necessary items. However, due to setbacks relating to the use of the seabed near Little Water Caye and Hatchet Caye, i.e. financial issues relating to the Lands and Surveys Department, the project was postponed. The PPCSL was able to circumvent the setback by collaborating with the Fisheries Department. The PPCSL received a one-year, renewable, research permit for the establishment of 10 test plots for seaweed cultivation. .

With the grant from the GEF SGP and the permit from the Fisheries Department, the PPCSL was able to procure the equipment and items necessary to establish the 10 test plots at each site. The plots were farmed intermittently over the next year and a half and produced approximately 100 pounds of dried seaweed per quarter, each. The seaweed harvested was sold in the local market at a price of US$15.00. In some cases, seaweed soaps, gels and smoothies were also sold and proved to be in high demand. For the regular farming activities, the PPCSL absorbed the cost of transportation, food, and lodging at Little Water Caye and also gave the farmers a remuneration of US$25.00 per day, as opposed to the standard

minimum wage of US$1.65 per hour (US$13.20/day).

Wanting to increase production and potentially reach export level, the PPCSL held several meetings with the Belize Fisheries Department and the Southern Environmental Association (SEA) in relation to the use of a one square mile area in the Gladden Spit and Silk Cayes Marine Reserve (GSSCMR), approximately two miles east of Hatchet Caye. The SEA co-manages the area with the Belize Fisheries Department and agreed to allow the PPCSL to utilize the one square mile area to cultivate seaweed. A five-year Memorandum of Understanding with SEA and the Fisheries Department was signed for the use of the area in the GSSCMR. Subsequently, another proposal was put forth to the GEF SGP to support the expansion of the farming activities into the GSSCMR. The proposal was accepted and the PPCSL received another US$50,000.00 over the course of a year and a half. The Cooperative established 23 plots in the GSSCMR and began cultivating seaweed. The seaweed was cultivated in similar fashion to that of Little Water Caye and Hatchet Caye; farmers were provided with the same benefits as before, which assisted them greatly in meeting their financial obligations.

The interest in seaweed cultivation, however, was not limited to just members of the PPCSL, and between 2009 to 2016 members of other interested fishing groups received valuable training. The PPCSL conducted various workshops and training sessions with fishers in Belize City, Punta Gorda Town, Dangriga Town, and most recently, Sarteneja Village. Interestingly, GEF SGP grant recipients in Providence and San Andres, Colombia, also received valuable training by PPCSL in an exchange visit done in March of 2015. The trip not only benefited the Colombians, but also contributed to the development of PPCSL's members as trainers. In addition, the PPCSL was able to develop the document, "A Manual on the Cultivation of Edible Seaweeds in Belize", with funding from the GEF SGP. The document served as the precursor to several documents, including a training curriculum inclusive of a farm and farmer certification programs, and a visual guide (training video), sponsored by The Nature Conservancy (TNC). The idea of the documents is to standardize the training and methods used for seaweed cultivation. It will ensure that the seaweed cultivation industry develops in a socio-economic and environmentally friendly manner. To date, PPCSL has trained over 100 individuals across Belize, and seaweed cultivation is now a main source of income for several individuals. In addition, the PPCSL is currently working with Coral Caye Limited, a private company, to develop value-added products from the seaweed, which will further increase the incomes of the farmers.

The environment also benefits from the seaweed plots through decreased fishing pressures, carbon sequestration and through its function as habitats for juvenile aquatic organisms. As more traditional fishers become involved in seaweed cultivation, less time will be spent exploiting the fish stocks. In addition, since both *E. isiforme* and *Gracilaria spp.* are algae, the plots will be contributing directly to the sequestration of carbon from the water (Muraoka 2004). Furthermore, each plot will also serve as habitat for juvenile fishes, lobsters, crabs and other crustaceans, and echinoderms as seen in all three sites. Juveniles often hide within branches of the seaweed where they are protected from large predators. In the case of echinoderms and juvenile fishes, some are known to use the seaweed as a source of food (Eklöf et al. 2006). These benefits, coupled with a decrease in fishing pressure will contribute to the replenishment of fish stocks.

Conclusion

The work of PPCSL provides socio-economic and environmental benefits. Therefore, their constant engagement of other fishing groups and organizations will allow them to lobby government for free use of the sea beds. This will in turn allow much more of the approximate 3,000 fishers to venture into seaweed cultivation. In addition, the development of the industry will allow other minority groups to engage in seaweed cultivation, thereby decreasing the level of poverty in Belize.

KEYWORDS: Alternative livelihood, Belize, fishers, seaweed, socio-economic

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