

Seamoss Cultivation in St. Lucia: Successful Rehabilitation, Sustainable Harvesting and Enhanced Income Generation with NGO Assistance

ST. LUCIA

Introduction

The south-eastern tip of the island of St. Lucia is being developed as a nature preserve and not without good reason. It provides income for three groups of people who can exploit, and if not managed well, destroy depletable natural resources found in the area. There are, for example, those who harvest the white sea urchin (sea egg) for sale or for personal consumption; those who use the mangrove for the production of charcoal; and those who farm seamoss (a type of seaweed), for food and commercial purposes. A major challenge taken up by one of the major NGOs in the Caribbean, CANARI, was to make all the economic activity associated with the harvesting of those resources not only economically viable and worthwhile for those involved, but also sustainable. Perhaps the most dramatic outcome of CANARI's support, has been with the cultivation of seamoss which significantly had been returned from the brink of depletion,

through increased cultivation. This was also enhanced by the introduction of a new species, resulting in the generation of new businesses based on sustainable harvesting practices.

Seamoss is used in St. Lucia as a breakfast food (porridge), as a drink and as a substitute for gelatin. Beyond its nutritional properties as a healthy natural food, it is regarded by some as an aphrodisiac. The previous pattern of harvesting was that anyone who wanted would simply go to the sea, rip the seaweed from the underwater beds, dry it by exposing it to the sunlight until it gets white, and prepare it as a meal, a mixer, a drink or for sale. However, indiscriminate harvesting went beyond this and eventually resulted in the depletion of the natural feeding and breeding grounds of lobsters and other creatures.

Background

Institutional Arrangements

Before the introduction of the project which saw the revitalization of seamoss cultivation in St. Lucia among other things, natural resource management was largely regarded as a technocratic exercise conducted by government agents who assumed responsibility for policy, formulation and resulting programme implementation. Although many institutions and communities on the south-east coast of the island had an awareness of the value of the natural resources in the area, there were no data sets to support and direct their conservation. That changed with a *Survey of Conservation Priorities in the Lesser Antilles* by the Eastern Caribbean Natural Area Management Programme (ENCAMP) which was later renamed in 1990, the Caribbean Natural Resources Institute (CANARI). The survey covered twenty-five islands or groups of islands, identifying the most critical areas for conservation. The data atlas completed for St. Lucia corroborated the perception of several local agencies regarding the criticality of the south coast region. One of those agencies, the St. Lucia National Trust, asked the Caribbean Conservation Association (CCA) for ECNAMP's assistance with the formulation of a management plan for two critical areas identified on the atlas: the Maria Islands and the Savannes Bay with its extensive

mangroves, seagrass beds and coral reef formations. In St. Lucia, the whole programme began in 1979 as an ECNAMP project of the University of Michigan.

Whereas this case concentrates on the changes as they affected seamoss cultivation, preliminary investigation of the two areas confirmed the value of the sites, and also suggested that the two areas (the Maria Islands and the Savannes Bay) could not be managed in isolation. In 1981, the first project document for the area was prepared and submitted by ECNAMP to the Trust, and to the Government of St. Lucia. The proposal emerging from this was adopted and the *Conservation and Development of the South Coast of St. Lucia Project* got underway with the formation of an Advisory Committee attached to the Ministry of Planning. Despite modifications with the passage of time, the original project objectives intended:

- The design and utilization of technologies, institutional arrangements and management techniques capable of effectively linking conservation and development.
- The definition and implementation of approaches and structures that encourage and promote community participation and responsibility.
- The testing, documentation and dissemination of the experiences obtained from the two areas above.

Funding the Project

Funding for the overall project included the involvement of several donor agencies; the German GTZ group, the MacArthur Foundation and the Ford Foundation. The German GTZ group funded the training programme. This is an on-going programme and although some agencies prefer not to provide seed money to new projects, some may be quite willing instead to help sustain a proven project requiring external assistance. It is therefore expected that other donor agencies might be willing to fund still unfinished but necessary work, particularly in marketing and end-product development.

Objectives of the Seamoss Rehabilitation Exercise

Traditional harvesting of the most common form of algae in St. Lucia, *Gracilaria* spp., (used exclusively for the local food market), caused severe seamoss depletion. The seamoss cultivation project therefore grew out of the concern for natural resource depletion associated with the need for environmental conservation on the south coast of St. Lucia. Among the objectives of the seamoss cultivation project are: (1) the identification of suitable seamoss species, of cultivation conditions, testing, and propagation methods beginning with those tried in other regions; (2) the adaptation of those

methods based on local materials and conditions; and (3) the identification of superior strains or species, and the establishment of those as commercial plots. In essence, the project sought to develop appropriate cultivation technology and to provide an alternative to the over-harvested wild seamoss stocks, through technology transfer and technical assistance, leading to commercial cultivation by coastal communities in St. Lucia (i.e., beyond just simply the area on the south-eastern coast).



Fig. 1 - Seamoss cultivation is predominant e.g. Praslin Vieux Fort Laborie

Project Review

Activities Undertaken by the Project:

Information Gathering

Seamoss cultivation project activities, focusing primarily on research, training and extension were carried out by CANARI, along with the participation of the Fisheries Department. The identification of persons already involved, and assessment of progress achieved, were undertaken by that

government agency. Information gathered revolved around the issues of growth rates, gel contents, selection of seamoss strains for improved yields and production, and the monitoring of habitats for optimal site selection for the establishment of farms. In addition, activities were also aimed at determining the maintenance requirements for farming sites.

Training and Research

Although seamoss farmers participated in most aspects of research, training efforts have been directed mainly towards researchers and the development of workers capable of supporting cultivation programmes in St. Lucia and in the rest of the region. Training activities have taken the form of workshops and internships. Interns tended to be student researchers (some completing post-graduate and doctoral programmes) coming from outside the region, whose research interests, must include aspects related to seamoss cultivation. As many students as possible have been accommodated, especially those whose studies bear some relation to the closing of knowledge gaps. One such recently concluded study related to the social impact of seamoss cultivation on local inhabitants.

Extension Services and Technology Transfer

Extension activities and technology transfer have been restricted to two areas in the south where technical assistance, credit facilities, and other forms of support have been provided to farmers. These activities have been largely supported by the Department of Fisheries.

Achievements of the Project:

Seamoss Cultivation as a Source of Income for the Rural Poor

In 1985, a group of seamoss farmers under the rehabilitation effort made their first harvests from a farm on the south-east coast. Today, the seamoss rehabilitation project has achieved success in many areas. It is perhaps the only regionally successful marine culture experiment with such great growth and income potential, for people in coastal communities. Although the project has not fully addressed the issue of markets, because of the small amount of capital required for start-ups, it provides an opportunity for the poor in rural communities to get involved in profit-making ventures with low-entry costs. The project has also surpassed the goal of satisfying the local demand for seamoss without further stock depletion. By 1994, thirty commercial farms were developed in the south-western village of Laborie, and at

Aupicon, near the town of Vieux Fort (see Fig. 1). A significant number of resource persons, have been trained to perform extension work and to assist in the promotion and cultivation of seamoss elsewhere in the region. One of the major project highlights is that technology has been transferred to people in Antigua, Barbados, Dominica, Grenada, Haiti, Jamaica and St. Vincent.

Knowledge Breakthroughs

Knowledge garnered regarding the properties of species of seaweed that are most ideal for cultivation has also been substantial. The better performing strain propagated, namely, the *Eucheuma* variety, was introduced from Belize. Testing of new species was funded by the German NGO, Appropriate Technology Exchange. Significantly, with the variety being drawn from the Caribbean, no new environmental problems or organism conflicts were introduced into the areas of cultivation. This variety, beyond its higher nutritional content in terms of protein level (7-10%), has also contributed to an improvement in farm yields, improvement in gel content and mixing characteristics which have lent themselves to the creation of a variety of drinks. Its marked resistance to epiphytes - a problem which plagued the *Gracilaria* species, represents a significant breakthrough in seamoss cultivation for St. Lucia and the rest of the region.

Technology Enhancements by Locals

Various farming techniques have also been tested ranging from the stake-and-line method, the floating bamboo raft, to the increasingly popular anchored line with discarded two-litre plastic PEP bottles as floaters. The last method has positive implications for recycling of plastic waste. It is noteworthy too, that the farmers themselves have been instrumental in perfecting this last technique.

Consolidation of a Link in the Food Chain

Damage to natural habitat through over-farming has been reversed to a significant extent. Remarkably, another organism has been successfully rehabilitated into the food chain in the area.

Displays of Self-reliance and Entrepreneurship

The rehabilitation effort has helped farmers to take charge of the development of their own product without outside financing and help. This has encouraged self-financing and entrepreneurship beyond the technical assistance provided by CANARI. In this regard, a recent and welcomed development has been the progress made regarding the commercial adaptation by a female St. Lucian entrepreneur - the production of ready to use seamoss gel, her *Creme De la Mer*. This has sprung

from experimentation with the Eucheuma variety in the production of seamoss porridge, a seamoss drink, ice cream and a tropical dessert using fresh fruit. The farmers themselves, have become responsible for the economic viability of their farms. This level of self-reliance is both refreshing and encouraging. Developments in seamoss cultivation are very advanced in St. Lucia, with fifteen to twenty people (including family members) involved; approximately 13% of the region's seamoss farming population are based in Praslin, Laborie and Vieux Fort. In the Caribbean, one hundred and twenty to one hundred and fifty persons are engaged in seamoss cultivation. They, including extension officers from regional Ministries of Agriculture, have received training through the project. Associated documentation has also been supplied to several regional centres associated with seamoss cultivation.

Enhanced Profile of Seamoss Farmers

The project has facilitated positive changes in methods of cultivation, testing and adoption. The new species brought from Belize tested in St. Lucia, has been growing wild in Antigua and is providing high yields from established farms, resistance to epiphytes, and better gel. Some St. Lucian farmers who had abandoned seamoss cultivation as a result of disappointment with the earlier species are resuming this activity. A most welcome development

is that income generated from cultivation activity from the new species has raised the profile and social status of those involved in seamoss cultivation in St. Lucia. Home-grown experimentation has promoted a shift away from the floating bamboo raft, to the floating line technique, which has generated improved yields. Significantly, this new method is being used to train interested persons including older farmers.

Greater Recognition of the Work of the NGO

The work of CANARI in seamoss cultivation generally, and its other conservation activities in the Aupicon region of Vieux Fort have so positively impacted the current administration that the NGO is now being approached for advice regarding the planned development of the area into a national park. The NGO is frequently consulted on environmental matters relating to this sensitive ecological area. CANARI has welcomed the new recognition, and has responded by giving information, including maps regarding sensitive ecological finds in the area. This development has extended into a collaborative management effort in which seamoss farmers are represented on the planning committee dealing with the creation of the national park. The effort too has developed into the co-management of other natural resources such as fisheries and charcoal production as firsts for the Caribbean.

The contribution of the NGO cannot be overemphasized. Outside St. Lucia, for example, in Antigua, and Negril in Jamaica, greater success with seamoss cultivation has been achieved than in other countries where NGOs have not been as active in the cultivation of the product. Ministries of Agriculture although benefitting from information documented by CANARI can assist up to a point, and are least capable of satisfactorily completing follow-up work. This is especially so with respect to those aspects which have commercial application. The degree of success so far achieved in St. Lucia is highly correlated with the level of co-operation and collaboration between the Government of St. Lucia and the executing NGO, CANARI.

Challenges to the Project

The Limitations of Extension Services and Concerns About Profitability

Despite the significant economic returns, which have, at least in one instance, enabled a farmer to pay for his own transport vehicle with proceeds arising out of seamoss cultivation, there remains however, only a small number of commercial farmers in St. Lucia. The situation is the same elsewhere in the region. Many factors militate against further penetration and cultivation. A primary constraint is that available

extension services may not always provide what is needed. The information may not be always relevant to the farmers' needs. The extension services too, do not seem able to maintain the conditions necessary to attract new entrants into the trade. Additionally, because of the small size of the local market and the satisfaction of local demand by farmers already in the venture, there is a reluctance by those currently involved to encourage new entrants. Profitability appears to be a major concern. For example, whereas the price per pound of seamoss in Antigua is in the region of EC\$80 (US\$1 = EC\$2.70), the price in St. Lucia ranges from EC\$10 -20.

Marketing and Business Development Constraints

Seamoss cultivation in St. Lucia remains largely a part-time occupation. Farmers have other interests to supplement their income, and there appears to be a problem of farmers making the transition from short-term harvesting techniques, to full-time and long-term farming strategies. Part of the problem lies with the marketing and business development aspects of production. Whereas the domestic market is fully satisfied, there remains the problem relating to the formation of an association of producers to take end-products to market. Additionally, there remain

some critical marketing hurdles to be overcome:

- Assessment of true market potential.
- Conduct of economic analyses of the products.
- Determination of the prices for the products.
- Product labelling, content and promotion and
- Standardization.

Although there is every likelihood of a guaranteed market in regions of North America and Europe with West Indian communities, the positioning of seamoss products requires specific attention, if a wider market is to be tapped.

Sporadic Financing

Sporadic financing also plagues the project. This particular problem underscores and provides a cogent example of the need for more consistent financing when transferring technology, if there is going to be any achievement regarding continuity and sustainability. Micro-credit schemes to supplement the impact of research and extension work of this project can make significant contributions to the overall success of seamoss cultivation in St. Lucia.

Special Rights and Access to Farms

Some farmers have encountered problems with beach access to their farms, as they sometimes have to traverse other people's properties to reach the beachfront. The problem is particularly acute for farmers in the Aupicon area of Vieux Fort. There is a need for active consideration of special rights, once a farmer has started operations in particular area, otherwise, beyond the issue of theft, conflicts may arise between farmers and others who wish access to the area for other types of activity.

Constraints: How They Have Been Addressed

Uniform Labelling

The problem of marketing seamoss in St. Lucia has been partially addressed by requiring farmers to use a uniform label for marketing their produce, even as they retain their identities as individual producers. Expectations are that the group will eventually evolve into a farmers' co-operative. The problem of market size (the saturation of the local market) is being addressed by investigations into market expansion into the UK, North America and other Caribbean islands, with funding assistance from the HIVOS group from the Netherlands. At the time of our investigations, conditions in two out of four identified markets have been established as positive.

Legislation of Access Rights

In response to the need for access rights for farmers, new legislation was enacted in St. Lucia, which allows farmers to lease part of the seabed for marine culture. This provision has also been incorporated into the harmonized OECS Fisheries Legislation, which now applies to all the OECS member states. The issue of access rights does not however appear to have been finally settled and efforts towards solving the problem continue.

Lessons Learned

The following lessons have been identified regarding the seamoss rehabilitation effort in St. Lucia:

- It is important to satisfy the need of long-term funding support for small development projects, beyond the fact-finding, documentation and exploratory stages, through to actual implementation of identified projects. For example, focus on technology alone will not make significant results in raising the standard of living of target groups while encouraging them to pursue their economic activities in environmentally-friendly ways, with attention to access to credit.
- There is need for the development of sound marketing strategies from the ground up, to bring products

from the development stage to the market shelves.

- There is need for training in small business management for prospective farmers, with special emphasis on the maintenance of records. The implications for human resource development are most apparent. The parallel hands-on education of the youth of the region, by organizations such as Junior Achievement, can help the next generation in this regard.
- There is a necessity for greater collaboration between stakeholders (developmental institutions, NGOs, government agencies, targets and the affected) with respect to developmental projects, if the region is to make greater strides regarding sustainable development.
- It is essential to take into account the whole range of technical assistance issues needed and related to bringing a final product to the consumer, that is, from initial production to marketing and distribution, and all the processes in between. These are critical factors associated with the imperative to empower and develop lower income individuals for the more market-oriented economies of the 1990's.

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- NGOs continue to play a critical role in the development of the region. The facilitating role of NGOs in successful project implementation is amply demonstrated by the seamoss cultivation experience in the Caribbean.
 - The virtues of participation and community involvement in sustainable development efforts cannot be over-emphasized.
 - The presence and work of organizations such as CANARI can lead to the reversal of environmental degradation in important and ecologically sensitive areas of countries, and to the conversion of essentially low-paying occupations into higher income generating ventures for participants, raising through the whole process, their standard of living and their social status in the community.
 - Side by side with the rehabilitation of a species, there can be other positive environmental spin-offs such as in this case-study, the protection of the habitat of other animal species (lobsters) and the recycling of two-litre soft-drink PEP bottles.

Conclusion

Seamoss cultivation in St. Lucia can be regarded as a small business concern which generates income to a small group of harvesters. Previously the over-harvesting of this sea-algae nearly caused the complete depletion of seamoss. However the introduction of modern techniques of cultivation has rehabilitated the growth with resounding success.

In spite of the renewed environmental conservation of the seamoss cultivation project, proper commercialisation of this product is yet to be addressed.

Further analysis is recommended of the national policy frameworks and environments necessary for providing additional support to seamoss cultivators, for them to realise the full potential of this project.

Very important strides have been made especially with respect to the research and extension elements of seamoss cultivation, but official support for market penetration and financial sustainability is critical.