

Overview of Conch Fisheries and Culture

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Nearly 2 years ago, many of the speakers here today met in Freeport, Bahamas, to discuss the development of conch mariculture. At that time, nearly everyone was concerned with the mechanics of growing conchs: feeding and handling of larvae, stimulus of metamorphosis, grow-out systems for juveniles and so forth. But there was also considerable discussion of the need for management of Caribbean conch resources, and what impact successful mariculture techniques might have on these needs. Today we will hear of considerable progress in conch mariculture which has been achieved since the Freeport meetings, and it is particularly important now to consider how these successes may be extended to provide real benefits to the people of the region.

To set the stage for this sort of discussion, this paper will deal with four general questions: (1) What are the general characteristics of conch fisheries within the region? (2) What are the common needs related to using conch resources? (3) How may conch mariculture affect these needs? and (4) What needs to be done to develop and extend conch mariculture within the region?

While those of us who write grant proposals for conch research often find it advantageous to speak in regional terms, it is important to realize that queen conch do not have uniform economic importance among the various Caribbean countries. In countries such as The Bahamas, Belize, the Dominican Republic and the Turks & Caicos, conch landings may approach 0.5 million kg annually, and have been even higher in the past. Landing and processing facilities are usually centralized under the control of government or fishery cooperatives. The importance of conch to local economics is well-established, and prospects for improving or managing conch fisheries are of immediate interest. In contrast, conch fisheries in other countries are less productive. St. Kitts/Nevis, St. Vincent and Grenada, for example, have yields which range roughly from 25,000 to 50,000 kg per year. Fishing effort for conch in these countries is heavily influenced by the buying practices of a small number of private entrepreneurs who export regularly to Guadeloupe, Martinique and Trinidad. Conch fisheries in these countries do not have the same current or historic importance as in islands like The Bahamas, and consequently the management and development of these fisheries has a much lower local priority. At the same time, these conch resources are in considerable jeopardy, first because there is virtually no real regulation, and second because relatively modest increases in fishing effort or wider use of diving equipment would probably allow harvest capabilities to exceed natural production capacity. Finally, there are islands such as Montserrat and Dominica where annual landings are on the order of 5-10,000 kg. These harvests are almost entirely for local consumption, although fishermen in both islands have been approached by buyers from Guadeloupe seeking additional supplies of conch.

The point here is that although *Strombus gigas* is distributed throughout the Caribbean, the distribution and use patterns are not uniform, and projects to develop or manage conch resources will require considerable local adaptation and possibly completely different approaches depending upon circumstances at each project site.

But while distribution and economic importance of conch resources varies within the region, there are also common fundamental problems. In the simplest analysis, Caribbean nations need to derive maximum benefit from every natural resource including queen conch. While conch are a local food staple in some areas, it is the

potential for generating export income that motivates most of the local interest in this species. At the same time, there is very little doubt that the technology exists to harvest conch to near extinction, and this technology is well-within the reach of entrepreneurs in most islands. This danger is underscored by the fact that the International Union for the Conservation of Nature and Natural Resources is planning to include *Strombus gigas* in its Invertebrate Red Data Book as a species "threatened as an economic resource."

Faced with a genuine need to use conch resources, combined with harvest capacity and market demands which probably exceed natural production capacity, the need for management is obvious. The traditional approach, of course, is legal restrictions, which may protect the resource but doesn't really lessen local needs. Besides, many small islands find legislation only marginally effective, and where landing sites are diffuse enforcement is often impractical. An alternative is to supplement natural production of conch through the various manipulations that we include in the term "mariculture."

At this point the long-range objectives of conch mariculture projects fall into one of three categories: (1) Rehabilitation of depleted areas by "seeding" hatchery-reared juvenile conch into formerly productive habitats. (2) Development of techniques for high volume commercial production. (3) Development of techniques for small-scale "cottage industry" conch production.

Other speakers will discuss these prospects in some detail, but two points deserve advance emphasis: First, the success of a conch mariculture program in small islands cannot be judged solely in dollar profit terms. A project which generates employment or permits artisanal fishermen to maintain or expand their catch can be of substantial local benefit, even if it realizes no profit at all. Second, if a mariculture project is intended to produce local benefits, then that project must reflect local objectives and be geared to local capabilities and interest. Importation of technology or establishment of commercial mariculture operations do not necessarily guarantee local benefits. The key to effective marine resource management in the Caribbean is local commitment, and projects to develop and protect Caribbean conch resources must assign priority to locally perceived needs if this commitment is to be secured.

With these considerations in mind, what needs to be done to further develop and extend mariculture techniques for improved use of conch resources in the Caribbean region? First, we should recognize that mariculture techniques for other species have evolved largely in the context of pilot projects directed toward specific use-oriented goals, and the existence of a variety of pilot-scale conch mariculture projects throughout the region is highly desirable. At the same time, conch mariculture is still very much in its infancy. Research directed toward identifying optimum diets, culture densities and grow out systems is a general need, but may be difficult to accomplish under field conditions, making the role of institutions such as the University of Miami or the University of Puerto Rico particularly important. Another, very valuable function is being performed by Megan Davis at PRIDE in maintaining contact and free exchange of information between various conch mariculture programs. In other words, if current interest and activity in conch mariculture continues, we can expect further development and refinement of techniques as a natural consequence of operating pilot scale projects. The question which becomes increasingly critical is when and how should these projects be extended to other Caribbean countries. At this point, despite the progress made in the last 2 years, conch mariculture is still an experimental affair. New conch mariculture projects in the Caribbean should be considered in the context of evaluating a new approach toward meeting local objectives, rather than as an activity which can guarantee positive results.

Last year at the 34th GCFI, a number of case histories were presented dealing with

shrimp mariculture. Two points were made repeatedly which should be recalled here. First, mariculture in general is a high risk proposition, and for every success there are numerous failures. Second, a substantial degree of site-specific tailoring is almost always needed. In one case more than 3 full years were required to implement a supposedly proven mariculture system, even with access to substantial funding and professional expertise. The economic viability of commercial-scale conch mariculture has not been established, and considerable risk capital will be needed before such an evaluation can be made. The prospects for rehabilitation and cottage industry mariculture require similar evaluation. It is highly desirable to extend the necessary experimental work to other Caribbean countries and to involve local personnel in these efforts, but it must be clear that results and benefits cannot be guaranteed. Because recent progress in conch mariculture is both exciting and encouraging, we need to insure that we do not encourage unrealistic expectations among potential beneficiaries or among prospective investors. Exaggeration really isn't necessary anyway. The seriousness of the problem, and results to date, should provide more than enough justification for continued efforts to establish the usefulness of mariculture in managing conch resources for the benefit of the people of the Caribbean.