

## Overfishing: The Haiti Experience

Haiti, which shares the island of Hispaniola with the Dominican Republic, provides many contrasts. Desert areas in the rain shadow of the low mountains provide little in the way of sustenance for man or livestock, while the mountainsides in some regions produce large quantities of vegetables and a few fertile, well-watered valleys are planted with rice and other grains, fruits and vegetables.

Although Haiti, with a population of 6,000,000+, is surrounded by ocean on three sides, the country is a net importer of fish. The native fishery employs primitive technology, yet in certain areas overfishing is causing the depletion of what is, perhaps, Haiti's last natural resource.

### La Gonâve

La Gonâve is a 55 x 12.5 km island located near Port-au-Prince in the Gulf of la Gonâve.

It is difficult to understand how the residents of la Gonâve, numbering about

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60,000, selected their village sites. Typically, villages are found in areas which are far from freshwater. Shallow wells along the upper beach provide brackishwater to coastal dwellers. That water can be used for washing and is even used to irrigate tobacco plants started on platforms, but freshwater for drinking may have to be carried long distances on the backs or heads of people.

Small dugout canoes and sailboats comprise the motorless fishing fleet of la Gonâve, Haiti. Photo by C.C. Kohler.

### The Marine Fishery

Fishermen on la Gonâve use primarily Z-traps set from dugout canoes, though some fishing with gillnets also occurs. The traps are placed near coral reefs not far from shore. Since the boats are small and motorless, there is no fishing activity in deep water.

While the corals are healthy and prospering, few fish are observed and most are of small sizes.

The status of the reef fishery is unquestionably related to the intensive pressure placed on reef fish populations by fishermen. Important in the overfishing problem is the fact that fish of almost any size and species are marketable on la Gonâve. Z-traps are constructed so that fish as small as a few centimeters are retained, and it appears likely that most species are taken before they reach reproductive size. If that is the case, recruitment of fishes to the reefs must



Haiti fish traps woven from reed. Photos by C.C. Kohler.

come in large part through ingress from other parts of Haiti, or perhaps other parts of the Caribbean.

Schools of jacks and an occasional small barracuda are sometimes seen along the coastal reefs of la Gonâve, but large individuals of non-schooling reef fishes seem almost entirely absent. Such common Caribbean groups as angelfish are only rarely observed. Overfishing has also extended to the queen conch and spiny lobster. Only small specimens of those animals are observed on the reefs or in the marketplace.

#### Dried Fish from Canada

Underwriting the perception that the reefs are not producing sufficient fish protein to supply the needs of the people of Haiti, and particularly those of la Gonâve, is the fact that dried, salted fish (mostly herrings) imported from Canada are in great demand.

Boats with fish captured on the coral reefs are met at the shore by individuals who purchase them for their own use or for resale. In either case, fresh fish are consumed almost immediately since they will quickly spoil in the tropical environ-

ment where refrigeration is almost unknown.

#### The Aquaculture Alternative

A demonstration project aimed at producing the freshwater blue tilapia (*Oreochromis aureus*) has been initiated on la Gonave to show the people how to raise their own fish protein.

During 1984, tilapia was given to individuals for home consumption and a fish seller was also asked to market some of the cultured tilapia. The fish proved readily acceptable and brought a competitive price. The problem will be to culture significant numbers of tilapia and put them on the tables of consumers.

As indicated above, freshwater is at a premium on la Gonâve. Thus, extensive pond systems are effectively ruled out as chambers for fish culture. In addition, many areas on the island contain soils that retain water poorly, so seepage would be a significant problem. Even with those constraints, given the severe need for animal protein on la Gonâve, even isolated ponds which produce small numbers of fish would be beneficial.

#### Regulating and Expanding the Marine Fishery

Countries which utilize the expertise of fisheries scientists in the management of fish stocks have learned to avoid overfishing problems of the type described at la Gonâve. Yet, marine fish management strategies are not well developed in most nations and the management of coral reef fisheries is in its infancy. On the surface, regulation would appear to be the best approach in Haiti. Increasing the mesh size of Z-traps would permit escapement of small fish, allowing them to survive and reproduce before being removed from the fishery. Limiting the number of fishermen or number of traps allowed within a given length of coastline might also be effective.

While the implementation of sound management techniques holds out the possibility that the reef community might recover and eventually sustain a stable fishery, the realities of the situation in Haiti indicate that the solution is not quite that simple. First, there are virtually no trained fisheries scientists in the country. Outside expertise



A pilot-scale project for integrating freshwater fish production and gardening has been conducted on la Gonâve.

could be obtained, but once management strategies were promulgated, there is little that could be done to enforce either gear restrictions or limited entry into the fishery. Even if enforcement officers were available, the need for animal protein by the population would lead to extensive violation of regulations; so extensive that law enforcement personnel would not be able to handle the situation.

Could the fishery be expanded in an offshore direction? That possibility certainly exists. The likelihood that larger,

Another possible solution to the problem is the development of marine aquaculture. There has been some interest in Haiti by entrepreneurs in establishing shrimp farms, though no commercial enterprises have been initiated as yet. Marine finfish farming would also appear feasible. Coastal ponds might be constructed for such ventures, but the constraints are many.

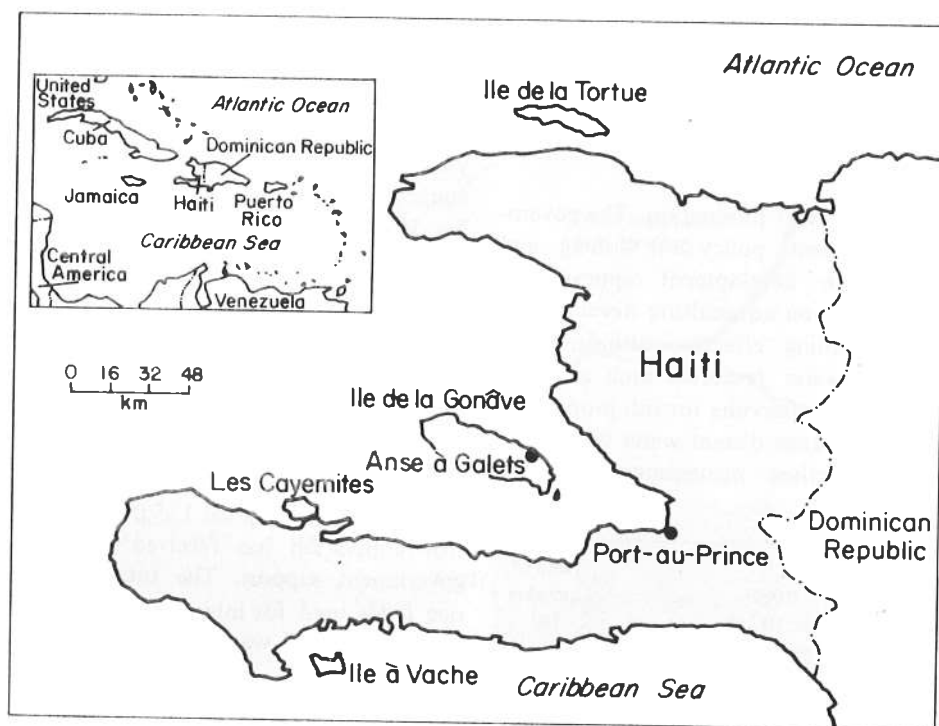
Evaporation of seawater does not lead to loss of salts, so salinity increases in ponds as evaporation occurs. Conversely, low salinities can result when

Haitian from buying the product. The nearest potential market would be Port-au-Prince, some five hours away by boat and truck. If aquaculture becomes even marginally successful in Haiti, the Port-au-Prince market would quickly become saturated because only a small fraction of the people in the city could afford the product. The next option would be export, meaning frozen storage or shipment of fresh fish on ice by air. Either would be expensive and require the development of more infrastructure.

#### Surrounded by Plenty?

Haiti would seem an excellent example of how perception of the limitless bounty available from the sea is a misconception. Worldwide, man may be removing through fishing activity nearly all that can be harvested on a sustained basis. In places such as la Gonâve, Haiti, the ability of the sea to provide has been exceeded and the resource is damaged, perhaps beyond repair unless a way can be found to effectively regulate the fishery. Perhaps Haiti best serves as an example of what could happen throughout the coastal marine environment if we don't learn to apply effective management strategies to the fisheries of the world. It has already been found that fishing offshore has become increasingly expensive due to the costs of shipbuilding and fuel. While those costs are currently relatively stable, they can be expected to increase again in the future, driving the cost of fishery products to even higher levels. While high prices for luxury seafoods like shrimp bode well for mariculturists in many countries, various factors influencing the situation in Haiti indicate that mariculture in that country would be a risky enterprise.

In fishery development, change cannot occur overnight, or perhaps even in a matter of years. Over the long haul, education will be a key to changing attitudes and approaches which will lead to effective management of resources. It must, however, be recognized that a starving person is concerned only about where the next meal will come from, not that the fish eaten today represents one of the last available. That problem becomes important only when the next series of hunger pangs begins. ●



more desirable fish species exist in water only a few hundred meters offshore of the present fishery is high. Pelagic fishes such as mackerel and tuna are expected to occur in the Gulf of la Gonâve, though currently there is no fishery for them. Fishing offshore would require motorized vessels of considerably larger size than those used by the nearshore fishermen. Not only would the costs of such vessels be prohibitive, but fuel and spare parts for marine engines are expensive and difficult to obtain, particularly on la Gonâve. However, fishermen might move out into somewhat deeper waters [less than 30 meters (15 fathoms)] if such simple materials as hooks, lines and chicken wire (for reinforced traps) were more readily available.

rainfall exceeds evaporation and the saltwater in a pond is diluted. In arid environments, it is necessary to add freshwater to ponds at intervals to keep the salinity from becoming too high. Since freshwater is at a premium on la Gonâve, salinity control could be difficult.

Other problems include the virtual absence of mechanical equipment, so ponds would have to be constructed by hand; the absence of suitably trained aquaculturists; the high cost of imported feedstuffs from which to manufacture pelleted rations; and the need to preserve the product properly for shipping. With respect to the last factor, the costs involved in producing cultured fish or shellfish would preclude the average