

Mining the gold of the sea

In their search for sustainability, artisanal fishing communities in Ceará, northeast Brazil, are combining tourism with fishing to enhance incomes

The artisanal fishery in Brazil contributes to over 50 per cent of the total capture of fish and crustaceans, and accounts for about 90 per cent of the country's fishers and fleet. Artisanal fishing dates back to before the European discovery of Brazil around 1500, as indigenous peoples explored the coastal areas for their subsistence, using rafts made of wooden logs tied together with ropes. The rafts were called *piperi* or *igapeba*. When the Portuguese fleet landed on the shores of Brazil in 1500, they christened the rafts *jangada*, after *janga* or *jangadum*, similar craft they had seen in India, in the province of Goa.

By the early 17th century, responding to the increasing need for fish from a growing population, some ingenious boatbuilder added a sail, a centreboard and other helpful accessories that allowed the *jangada* to sail windward and start to plough the ocean. With the colonization of Brazil, slaves began to be employed in fisheries. The prize of a slave fisherman varied with specialization, depending on whether he was a shrimp fisher slave, a shell collector or raft-builder, and so on. By the 18th century, fishermen were obliged to the middlemen who controlled every aspect of capture (boats, fishing gear, fishing spots) and, of course, the sale of the product. Around 1840, the government discovered fishermen as ideal inputs for the navy and began to create "Fishing Districts" in a recruitment drive for warship crews. Almost 80 years later, around 1919, the navy embarked on a military mission called the "Crusade of José Bonifácio", establishing *colonias de pescadores*, (fishermen's colonies) along the country's coast to enlist fishermen and their sons for the navy and to tie them, once and for all, to the national defence system. Even after the navy turned over control of the fisher colonies to municipal

governments, the fishermen did not learn how to become independent, and continued to be exploited by middlemen and politicians. Even as the lobster fishery and its potential for export was discovered around 1955 by an American called Morgan, fishermen continued to work hard capturing lobsters without getting a just price for their catches, as the middlemen made sure they were kept dependent on them for traps, bait and cash advances.

A movement organized by fishermen from the north and northeast of Brazil in 1986 finally gave them their first victory on the way to independence, as the revision of the Federal Constitution of 1988 recognized the right of fishermen to organize in fisher colonies through democratic elections. However, many colony presidents managed to remain in power through pseudo-elections and continued to enrich themselves at the expense of the fishermen they were supposed to represent. Only in 1992 did fishers start to speak up about their exclusion from fisheries management, and started to mobilize to become part of the decision-making process of fishery and coastal development.

Strange odyssey

Ten years have passed since the odyssey of four men and two women from a small fishing village, looking for answers for their artisanal fishery. The sail-raft named *Comunitária* (Community) left from the beach of Prainha do Canto Verde in the State of Ceará at high noon on 4 April 1993 with four fishermen (Edilson Fonseca Fernandes, Mamede Dantes de Lima, Francisco Abilio Pereira and Francisco da Silva Valente) aboard, accompanied along the coast in a small car by two women from the village: Marlene Fernandes de Lima, then president of the village

association, and Michelle Schärer, a graduate in marine biology from the University of Central Florida.

The girls were responsible for logistics and support services such as food supplies, communications, press relations, medical service and the organization of meetings with fisher, environmental and human-rights groups along the route, with over 20 intermediate stops. Seventy-four days later, the brave travellers arrived in Rio de Janeiro, where they were welcomed by a large crowd, representatives of NGOs, authorities, the media and Doryval Cayimmi, an immortal composer of Brazilian popular music, many of whose songs were about the romantic *jangadas*.

The expedition was a spontaneous reaction and protest against predatory fishing, real-estate speculation, exclusion of the community from tourism development, and the lack of support for artisanal fishermen. Fifty-two years earlier, four fishermen from Fortaleza had made a similar trip to Rio to claim retirement benefits for fishers. That voyage, led by master Jacaré, was to gain worldwide fame, including coverage in the 8 December 1941 issue of Time magazine, and because of the American movie director Orson Welles, who filmed the story during a stay in Brazil, amid controversy about the tragic death of Jacaré after the *jangada Saint Peter* was turned over by a wave. The film was finally finished by another team from Paramount and released under the title *It's All True* in 1994.

The expedition had been planned and carried out by a small group of community leaders, idealists and volunteers from the Federal University of Ceará who worked hard to make the trip a success. Eight NGOs gave moral support to the expedition, while government agencies' staff and other fishery stakeholders chose to stay away. Naval authorities who had never envisioned independent fishermen, tried to abort the trip at the last moment, but this time the fishermen decided not to obey. During the 74-day trip, four workshops were held with the participation of civil society, NGOs, fishery specialists, fisher community leaders and invited

government representatives, to discuss the themes of the protest. Concrete proposals from the workshops for solutions were subsequently sent to federal, State and municipal authorities, and NGOs and fisher organization throughout Brazil.

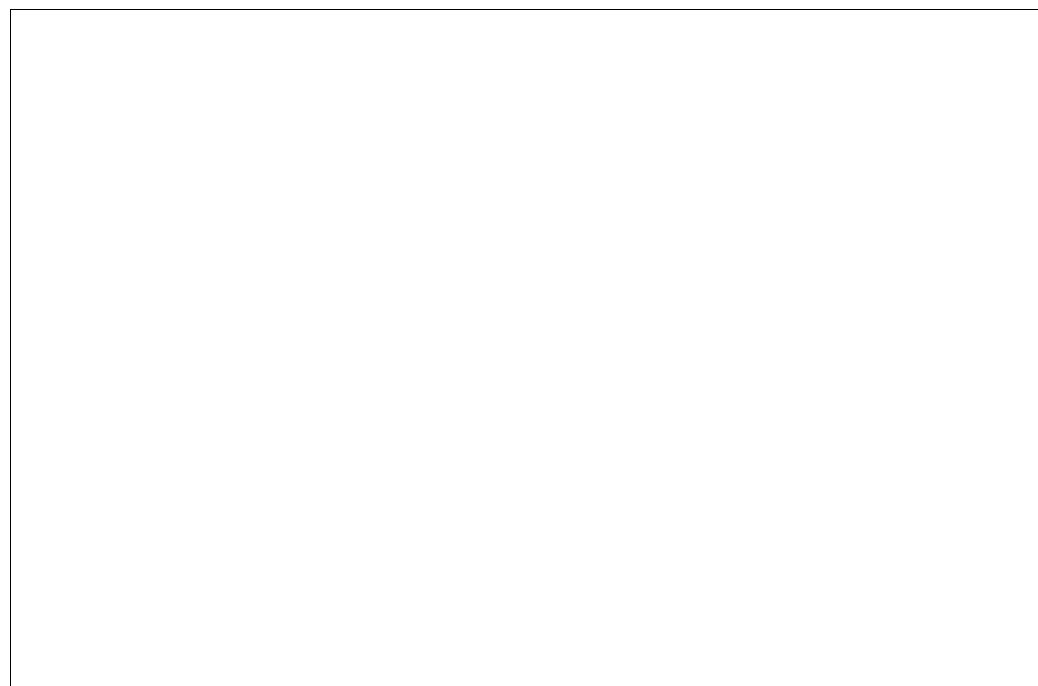
Meanwhile, the fishermen and friends patiently made alliances with other villages, NGOs and some fishery managers. With two years gone by and no real government reaction to their demands, the fishermen decided to protest once more. On 4 April 1995, 500 fishers, women and activists marched to the seat of the State government and received the promise for action by the Governor's deputy. Shortly thereafter, the "State Fisheries Committee" was created by a government decree and, for the first time in Ceará's history, all fisheries stakeholders sat down at one table. The NGO Instituto Terramar, founded in 1993 as a result of the historic expedition, was now leading fishers' organizations, and many of the subsequent developments were a direct or indirect result of that adventurous voyage.

After adding a sail and a centreboard to the *jangada* in the 17th century, few modifications have been made to this remarkable craft. The major change has been to replace tree trunks with planks around 1950, which added comfort and speed to the boat.

The *jangada* continues to be the ideal boat for fisheries close to the coast (within 20 nautical miles, in the case of the coast of Ceará) as other boats are too costly to build and operate. The Ceará fishery is essentially a day fishery or, at most, a one-night fishery, where the technological limitations of the craft are not an obstacle, as fishing spots are marked in the minds of the fishermen.

Technology problem

However, the *jangada* is used less in the fishery up to 60 miles out on the continental shelf, due to the difficulty of unfurling the sails for 10 to 12 straight hours and spending four to five uncomfortable days at sea, exposed to the elements. Without land in sight, the lack of technology to locate and mark fishing grounds becomes a real obstacle. So the



fishers of Prainha do Canto Verde, with a little help from friends, have adapted a sail catamaran for the fishery, with excellent results. Improved security, comfort and stability, coupled with modern technology (everything except a motor), easy maintenance and low operating costs make this boat ideal for the multi-species fishery.

Economically too, the sail catamaran beats motorboats by a wide margin. The sail catamaran is, without any doubt, the boat of the future to explore the continental platform of Ceará and Rio Grande do Norte. Another advantage of modernizing the fleet with catamarans is the potential to create jobs for boatbuilders in the coastal communities. Substitution of motorboats in the coastal area with sail catamarans will reduce both unemployment and fishing effort at the same time. This substitution with a 'soft' technology will greatly increase food security for three reasons: (a) more fishermen can be deployed per trap; (b) new jobs can be generated for boat-builders; and (c) the overall fishing effort can be reduced.

However, other obstacles exist that prevent the development of small-scale fisheries in Ceará. The main hurdles are low literacy rates, lack of professional training, little extension work of fisheries scientists in coastal communities, and the historical perception of fishermen that

everything will be alright as long as they follow instructions and leave the rest to God. The commonly used expression in Portuguese "*Deixa comigo*" ("Let me take care of it") typifies the continued dependence that has led to extremely low self-esteem of small-scale fishers in Brazil. But fishers have a good understanding of ecological processes and can talk hours on end about what fish do and eat and is the right time to catch them. Fishers understand the concept of overfishing and sustainability, but they cannot articulate their innate understanding in a written form. Experiences in the lobster fishery along the eastern seaboard of Ceará over the last ten years have shown that investments made in awareness and technical training lead to greater self-esteem and co-operation with fishing regulators in enforcement actions.

Predatory fishing

Some artisanal fishing communities in Ceará have been actively involved in efforts to curb predatory fishing since 1993, through community meetings, partnerships and financial contributions for enforcement trips. These efforts led to two major events in Ceará that discussed and promoted responsible fisheries. The first was in 1997, when Instituto Terramar, together with the International Collective in Support of Fishworkers (ICSF), organized, the First International Conference on the FAO Code of Conduct for Responsible Fisheries, which brought

together over 300 participants and the support of IBAMA (the Brazilian Institute for the Environment, responsible for fisheries).

The second event occurred a year later, in the form of the “Lobster Caravan”, a two-month, 20-community roadshow to raise awareness among fishers and their families of the need to preserve the lobster fishery. The caravan was a team effort, led by the Fisheries and Education Departments of IBAMA and Instituto Terramar, with fishers and NGOs, along with promotional support from local government and other stakeholders. In a recently inaugurated community fisher school in the village of Prainha do Canto Verde, high school student fishers show self-confidence and are developing their own projects to construct fishing gear, artificial reefs or mounted structures for seaweed farming. Rather than being the cause of the problem—as fishing industry officials are quick to point out—artisanal fishermen are becoming part of the solution for sustainable fisheries management. Unfortunately, the expectations awakened by the creation of the Special Secretariat for Aquaculture and Fishery at the ministerial level did not fulfill the campaign promises made by Brazil’s President, Luis Inácio da Silva, popularly called “Lula”. Preference is still for industrial fishing, big companies and unsustainable shrimp-farming operations, and the entrepreneurial lobby is growing stronger.

There is agreement among all stakeholders that fishing effort is the number one problem in our lobster fishery. But there is no agreement on how to reduce the effort. As a matter of fact, the fishing industry points the finger once again at the artisanal fishers.

As already shown above, the ideal craft to capture the great variety of fish and seafood in the coastal zone are sailboats (*jangadas* close to the shore and catamarans towards the end of the continental shelf). Their low operating cost and great economy, as well as the low fishing effort they expend and their versatility, make them ideal for a multispecies fishery, and also offer the opportunity for fishers to combine

fishing with other revenue-generating activities like tourism and sport fishing. Thus, fishermen can quickly switch from lobster fishery to some other activity if there is a need to reduce the fishing effort.

The continental shelf on the coast of Ceará and Rio Grande do Norte (a major lobster fishing area, with many nurseries) is very vulnerable to overfishing by the motorized fleet. The motorized fleet explores only the lobster fishery, and many fish with illegal gear and techniques (like mechanized diving) in the coastal area. Boats of 12-15 m length, carrying 600 to 1,000 traps, add more pressure on lobster stocks and compete for space with small *jangadas* fishing with 40 traps. Worse, the State finances this madness by subsidizing fuel for the lobster fleet. If subsidies are used, they should be applied to reduce effort or explore other resources. The money could be applied for co-management education programmes for the fishery or to encourage low-impact craft and gear. There is also a need for better control of the sail fleet in the coastal area and for better management and enforcement of existing laws and regulation, in co-operation with fishers. Food security in the coastal area cannot be maintained at its present high level if artisanal fishers are expelled from the highly lucrative fishery. Stakeholders for the industrial and commercial fishery will need to sit down and look at their future with a long-range vision for a sustainable fishery. So far, there has not been much of an effort from industry and vessel owners to do so.

Gold of the sea

Lobster is popularly called the “gold of the sea”, because of its high value. Since Ceará’s fishing communities have all but eliminated intermediaries, the fishers receive about 90 per cent of the export price of US\$32 per kg of lobster tails in 2001. At the end of 2004, artisanal fishermen would fetch around US\$50 per kg of lobster tail, half the value of the official monthly minimum salary of US\$100. Premium fish species, on the other hand, fetch US\$2 to US\$3 per kg. With lobster catches decreasing since 1991, nobody fishing with traps has become rich, since the cost to equip a motorboat with legal fishing gear is very high. Thus

more and more motorboat owners are either going out of business or turning to illegal fishing.

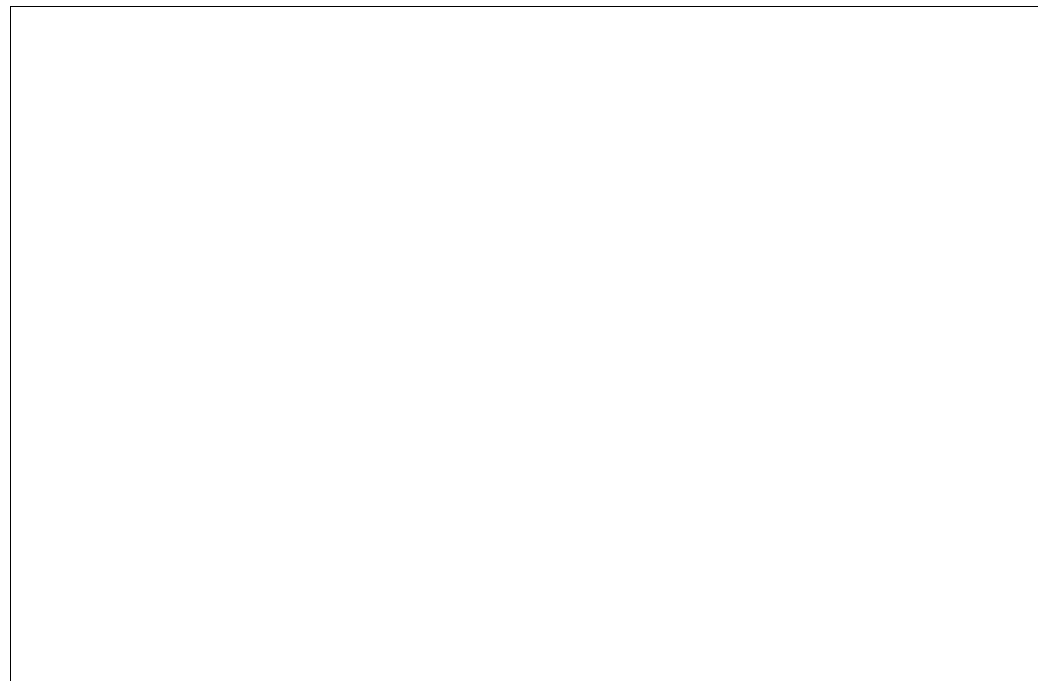
A review of the chain of custody is crucial to understand the contribution of fish trade to the food security of the coastal population of Brazil. The middleman is a figure that has haunted fishermen since the 17th century, and only in the last decade has this started to change. Under the command of the navy, there were fixed percentages of the catch that had to be delivered to the president of the fishermen's colony or the local co-operative, and to be distributed to dignitaries and government officials. Only the leftovers were meant for the fishermen to keep.

Only in the 1970s did the Pastoral Fishermen's Council (CPP) in Olinda, Pernambuco, make a first attempt to organize fishermen into co-operatives and support their struggle for honest elections in the fishermen's colonies. This also led to the first attempt to train leaders of fishing communities to become informed citizens. Some of these leaders are still part of a network of fisher movements such as Movimento Nacional de Pescadores (MONAPE, the national fishermen's movement), Fishermen's Forum of the State of Ceará and groups of fisher colonies in the States of Pernambuco, Alagoas, Pará and Maranhão that have close ties with the CPP.

Ceará's fishers depended on middlemen for various reasons: distances from ice plants; lack of transport, working capital and administrative skills; as well as mistrust and individualism. Finally, realizing the increasing importance of income from the lobster fishery, several communities on the eastern seaboard already working together to fight predatory fishing, started to exchange experiences on how best to do away with middlemen. Fish merchants have the advantage of easy credit from lobster exporters, who were very generous with the millions of dollars they received in government subsidies, which they used to provide lobster traps, bait and cash advances to the fishers who were chronically in debt. So while one community started to build their own traps, another got some working capital, and this way, they slowly started to cut out the middleman. Communities, for the first time, joined together to negotiate prices directly with exporters.

Price increases

For some communities, this meant an increase of up to 50 per cent or over US\$10 per kg of lobster tail. The same happened with the marketing of fish, with substantial increases in the price of fish, in the range of 50-70 per cent at the time of breaking the monopoly of the fish buyers. The number of communities marketing their own production is increasing continually. They travel and meet to



exchange knowhow on boat and fishing gear technology and alternative income generation from other marine resources such as seaweed and oysters.

The exchange of market information, especially about lobster prices, guarantees top market prices. On two occasions, fishermen even threatened to pull their traps, unless prices were adjusted for increases in the exchange rate of the local currency. (Prices for lobster are quoted in US dollars.) Some leaders have contacted exporters to discuss closer co-operation in the handling of lobsters and control of their source of origin, in order to cater to quality-conscious niche markets.

One community even went through a certification process. Lobsters fished by the artisanal fleet are landed live and are of the best quality. The high value of lobster and some demersal fish from artisanal fisheries has allowed many fisher families to improve their living standards and food security. As only lobster tails are exported, there are a great number of lobster heads available for local consumption, and it is quite normal for poor families from nearby villages to walk 10 km to the beach where they get lobster heads to take home; solidarity still works here and helps food security. The same cannot be said for the motorized fleet, which discards a lot of lobster heads at sea.

Boats equipped with rudimentary and life-endangering diving gear, have the lowest investment cost and the highest capture capacity. Divers who die or are paralyzed for the rest of their lives from diving accidents, are quickly replaced from a waiting list of young men willing to risk their lives. Due to poor enforcement at sea, the chances of getting caught are slim, and the likelihood of being prosecuted for environmental crimes, even smaller. Two divers can easily haul in 600 kg worth US\$ 18,000 in two days of diving. *Jangada* fishers, however, will have to work the whole year to catch that much in a good season. The average yearly catch for a motorboat with 400 traps is between 1,500 and 2,000 kg for 11 trips of 14 days each.

The other big business is the export of undersize lobsters to the US. According to calculations by an industry source, the profit potential per container exported is very high.

Special advantage

Illegal exporters thus enjoy considerable advantage in deploying their profits to be more competitive and increase their market share. NGOs have established a working relationship with agents in the US, which is the principal market for Brazilian lobster, and are working to convince the government to negotiate an agreement for co-operation in the inspection of export shipments to the US.

The Lacey Act allows the US Justice Department to prosecute offenders against environmental laws in other countries, such as importers of undersized lobsters.

The Wall Street Journal wrote on November 1, 2001: “Fisheries experts here (in Brazil) say the US, as the biggest importer of Brazilian lobsters, is unwittingly contributing to the demise of the *jangadeiros* because of its appetite for small lobster tails. The US has created a market for really small tails, so back in Brazil they keep catching them,” says Paul Raymond, special law enforcement agent.

More efficient prosecution of illegal fishers and exporters will considerably improve food security by allowing artisanal fishers to capture more lobsters locally. Responsible exporters will also benefit.

Development of resort tourism presents risks to food security in the coastal areas of the state of Ceará. Due to the high value of beach property, real-estate speculation has displaced communities from their living spaces on the coast and has only marginally contributed to the income of fisher families.

In their search for sustainability, artisanal communities are combining tourism with fishing to enhance incomes. According to a case study published last year, two pilot projects in Prainha do Canto Verde and Ponta Grossa have proven that complementary income-generating tourism activities can be undertaken by communities while at the same time preserving the environment and valorizing the cultural identity of fisher families. This experience is now being extended to other communities.

Other activities that bring in additional income are agro-ecology, handicrafts and information and communication technology. Land tenure is, of course, necessary for coastal communities to develop economically and is crucial for their survival.

Clearly, the survival of artisanal fishing communities is closely linked to the sustainability of marine fisheries. If we

can harness fishermen’s instincts and take advantage of their traditional knowledge, we will be able to guarantee food security for tens of thousands of coastal residents of Ceará.

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