

FISHERMEN'S VALUES CONCERNING THE QUEEN CONCH AND LOBSTER IN BOCA DE YUMA, EAST NATIONAL PARK, DOMINICAN REPUBLIC

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ABSTRACT

This paper, that follows from the ongoing Ecost project, departs from the reality of marine biodiversity degradation in the Caribbean. It first enquires how local fishing communities appreciate and measure the degradation of marine biodiversity. In this connection, it asks whether communities have social and cultural attachments to particular species. Then the paper discusses collective responses to degradation in general, and in particular to the implementation of marine protected areas. Underlying these collective responses are values that reflect what is held to be of cultural importance. The final section therefore discusses the values that figure in the Caribbean region.

Keywords: Values, marine protected area, Caribbean region, Boca de Yuma, Dominican Republic, marine ecosystem degradation, responsibly fisheries.

Introduction

The present article is based on data gathered in the community of Boca de Yuma, Dominican Republic. The results that are presented are the first outcome of a project dedicated to understanding the values of the fishermen of this community as regards two very important species: the lobster and the queen conch.

For this study twenty fishermen were interviewed, of a universe of about one hundred and fifty. Those who were interviewed were chosen at random. They were selected in the area around landing site, in the village of Boca de Yuma.

A questionnaire which consisted of approximately 60 questions was applied to them. It took into account such variables as the home, the profile of the fisherman, the degradation of the marine environment, the fishing of the lobster and the queen conch and values of the fishermen concerning these two species.

The first phase of this research was carried out in the months of April and May, 2006. The work calendar is organized so that in the following months of this year all the necessary information that will allow for consistent results will be gathered.

The community of Boca de Yuma was chosen for this study taking into consideration different motives. The principal one was that the village is in the periphery of the Parque Nacional del Este (PNDE) and the fishermen of the community use the waters of this one marine protected area (MPA) as site of their fishing activities. Another additional criterion was the particular feature that it is a community that possesses strong bonds with the sea and fishing activities.

This study is carried out in the context of the Project ECOST, which is financed by the European Union. The Parque Nacional del Este is an example of a marine protected area in the coral reef region of the Caribbean, with an ecosystem similar to the Wider Caribbean's surrounding coral reef ecosystems.

Acronyms

CELADE: Centro Demográfico Latinoamericano y del Caribe

COOPEBY: Cooperativa de Pescadores de Boca de Yuma

ECLAC: Economic Commission for Latin America and The Caribbean

ECOST: Ecosystems, Societies, Consilience, Precautionary principle: Societal Development of an assessment method of the cost for best fishing practices and efficient public policies

FAO: Food and Agriculture Organization

MPA: Marine Protected Area

ONE: Oficina Nacional de Estadística

PNDE: Parque Nacional del Este

UNESCO: United Nations Educational, Scientific and Cultural Organization

The community of Boca de Yuma

This section focuses on the community of Boca de Yuma. Through the use of a series of varied sources, we make a brief introduction on the community's history and geographical location. We also touch on relevant demographic, social and economic aspects, which emphasize the condition of poverty in which the community exists.

Boca de Yuma is a small Municipal District, belonging to the province of La Altagracia, in the Dominican Republic. It already existed in the XIXth century, and in accordance with García, (1968) in 1856 its beaches were used as a landing site for a few revolutionaries who were trying to overthrow the government.

Boca de Yuma is an authentic fishing community, which one finds placed in an extreme point of the oriental region of the island of Santo Domingo. Its coasts are not very distant from the Parque Nacional Del Este, a marine protected area.

In accordance with data of the Oficina Nacional de Estadística (ONE) and Latin American and Caribbean Demographic Center (CELADE) (2006), corresponding to the Dominican Republic 8th National Population and Housing Census of the year 2002, Boca de Yuma was populated at that time by approximately 2,013 inhabitants, 51 per cent of whom belonged to the male sex. In accordance with the same source the population of the village could be considered to have low levels of academic instruction, since 77 per cent scarcely achieved fewer than 6 years of schooling. Townsley (1998) highlights that "in many parts of the developing world, fishing communities are consistently among the people with the lowest levels of education."

The information of the cited census regarding housing indicates that there were approximately 544 houses in the Municipal District, of which only 10 per cent had piped water inside the dwelling. As for the sanitary facilities, 23 per cent of the houses did not have such service and another 36 per cent of the houses had latrines for such purposes.

According to Morillo (2006), 62 per cent of homes of Boca de Yuma live under the poverty line, a proportion that is considerably above the national level, which is 41 per cent. ECLAC (2006) says that according "to projections to the year 2005 based on economic growth in the countries of the region, 40.6% of Latin America's population is living in poverty."

Fishing is the principal source of income of the community, although the number of existing fishermen is not known, since registries of them are not available. The most conservative answers given by fishermen of the community when asked about this is a total 150 fishermen, while others suggest up to 500. The quantity of vessels docked in the landing site of the community reinforces the first information.

Commerce is an economic out-standing activity, including that related to fisheries. Agriculture is practiced in small scale, the same as cattle rising. Although Boca de Yuma is surrounded by many and huge beach resorts, the tourism is not much developed in the community, since it's coast is formed essentially by cliffs. Big beach resorts do not exist and few tourists are taken to the community to remain some hours, especially to take marine excursions.

The Parque Nacional del Este

This section focuses on the Parque Nacional del Este, it's origins, extension and main resources. The section also describes the human communities located in the park's periphery and the economic activities which are carried out in these communities, specifically, tourism and fisheries. The section also mentions the relation these activities have to the degradation of the marine ecosystem.

The Parque Nacional del Este (PNDE) was created in the year 1975, it has an approximate surface of 420 Km², according to Secretary of State for the Environment and Natural Resources (2006).

In addition to Boca de Yuma, next to the PNDE is the community of Bayahibe, located in the periphery of the park and; in the heart of the park there exist two communities, Catuano and Mano Juan, both placed in the small island of La Saona, which has an approximate extension of 117 km², as de la Fuente (1975) expresses.

Bayahibe is fundamentally a tourist community. Twenty years back it was an authentic fishermen's village. Statistics of the Secretary of Tourism (2002) allow us to appreciate the peak of tourism in this small community, which in 1996 had scarcely 436 hotel rooms and in 2001 it had already 2,747. During tourism's peak, the former fishermen passed on to work in areas linked to this activity, very few remaining who live off fisheries. The information of the ONE and CELADE (2006) indicate that Bayahibe had approximately 1,234 inhabitants in 2002. The same source points out that in 2002 La Saona island had 288 inhabitants, 8 of them in Catuano and the rest in Mano Juan or Adamanay, which is another name for the same community. A considerable part of this population lives off fisheries and others of trading and offering services to the tourists who visit the island every day for some hours, since no hotels exist on the island.

The Secretary of State for the Environment and Natural Resources (2002) indicates that of approximately 74 existing protected areas in the Dominican Republic, only 13 possess management plans, amongst these is the PNDE. In fact, in accordance with Geraldles (1997), the first management plan for a protected area in the country was for the PNDE, in the decade of 1970.

In the year 2001 the PNDE was presented at UNESCO and was declared a Human Heritage Site. One of the main reasons for this is the invaluable archaeological wealth that is preserved in the area.

Another aspect much emphasized in this marine protected area is that it is one the most visited by the public. Abt Associates Inc (2002) ranked it in third place amongst all those in the country. Most of the visitors of the PNDE are foreign tourists attracted by the park's coast and its numerous beaches. Of all the places of the park, La Saona island is the most visited. Fiberglass boats with powerful outboard engines are used to reach the island. These make numerous daily trips from Bayahibe, where the fleet of boats is located. Abreu (2006) points out that approximately 325 thousand people visit the island a year. From Boca de Yuma tourist trips to La Saona Island are sporadic.

Fishing activities

By virtue of the average width of his insular platform, the PNDE is one of the three places of major fishing potential of the country, in opinion of the UNEP (2001). The coast of this marine protected area is not homogeneous. An "ecological integral assessment" done by The Nature Conservancy (1997) indicates that in the coastal line of the PNDE there are beaches of white sand and relatively shallow waters, rocky intertidal coasts and cliffs and forests of varied mangroves, in regard to this see also Chiappone (2001).

The study previously quoted indicates that the fish fauna of the PNDE is "very rich from the point of view of taxonomy and trophic", being composed of approximately 122 species of fish. Nevertheless, the same study demonstrated something that had been already emphasized many times by Caboza and Pierce, Jr. (1975, quoted in The Nature Conservancy, 1997), that is, the large scarcity of large fish. This phenomenon is attributed to the use of the harpoon by the fishermen who use the area for fishing activities. Ruiz (1997), of the Social Research Team (EQUIS-INTEC), group in charge of the socioeconomic study for the "ecological integral evaluation" of the PNDE, makes it clear that, especially in the island of Saona and Bayahibe, a high percentage of the fishermen (44 % and 36 % respectively) lung dive, using the harpoon as gear.

In addition to the large fish, PNDE divers make an effort to catch lobster (*Panulirus argus*) and the queen conch (*Strombus gigas*). Both species have a ban season in the country. In the first case, its capture is ban during April and September of every year. The catch of queen conch is banned between July and October. In connection to the latter fishing resource, it is important to emphasize that this ban was imposed by a presidential decree. To adopt this measure, the Dominican head of state took into consideration, among other criteria, the "irrational handling of the resource and disorganized fishing"

inside the PNDE, reasons for which in some zones of the park the ban was established permanently, as is written in the third article of the cited decree.

Degradation of the environment and the coastal ecosystems

In a general sense the Dominican coastal line is much degraded as a consequence of human activity. Having evaluated the different marine ecosystems of the country, the UNEP (2001) demonstrates this point. The environmental degradation of the Dominican coastal line shows varied characteristics, depending on the type of marine ecosystem being analyzed. It is clear that this degradation has a negative impact on fishing activity.

According to the mentioned study of the UNEP, the ecosystems typical of the PNDE are under constant threat due to the use of more coastal areas by humans. Tourist constructions, which have grown rapidly in the peripheral area to the PNDE, are among the principal threats. The adverse consequences of tourism for the different marine ecosystems of the PNDE start as soon as a place is selected as hotel ground. In general, the building is erected few meters from the sea. The beaches and the coral reefs are without a doubt the most vulnerable environments to tourist activity.

According to UNEP, the most notable threats to the ecosystems mentioned above are linked to the transformation of the environment nearby to hotels. The delight of hotel guests goes beyond the hotel's facilities, such as restaurants, discotheques, etc. The beaches are an essential part of the enjoyment of guests and they must be adapted to the taste and safety of human beings. In order to satisfy swimmers the beach must be altered by means of the "destruction of the coastal areas of marine grasslands for enlargement of the swimming areas and the "dredging of the beaches", with all the erosive consequences.

But in the hotel located in the periphery of the PNDE, the pleasure of the sea is not limited to a few meters of beach. The daily visits of approximately a thousand tourists to La Saona island, also degrades that marine ecosystem, due to the high speed of the boats that ride to the island; also due to the effusion of toxic substances from the engines, or because of its anchors, when they make a stop in some point where there are shallow waters. The same happens with the recreational divers, who innocently walk on the reefs or when they swim and dive in the coral reefs. When they do this they remove "the sandy sediment that is re-suspended and fallen down on the corals." (UNEP, 2001).

In addition to the hotels and guests, there exists the threat linked to the population who resides in the park's peripheral communities. Among these threats we can mention, over fishing, capture of juvenile species, extraction of threatened species, the capture of eggs, as in the case of marine turtles, deforestation of mangroves with different finalities, such as making charcoal or capturing the species that inhabit this environment, among others.

The fishermen of Boca de Yuma

This part of the article is based on the results of twenty interviews and two exploratory visits to the village. All the interviewed fishermen were of the male sex. Nevertheless, through the interviews it was made clear that in Boca de Yuma women take part in the fisheries, one of them as owners of vessels. One of the interviewees indicated that his mother used to fish, as his father did. The one who gave this information is a 20-year-old young man, which means that this practice does not go back long in time. Intrigued by this source of information we consulted with one of the older fishermen that we had already interviewed and he indicated that at present the women in Boca de Yuma do not go fishing. He said yes, that many years ago there were women who used to fish on the coastal line, using a hand line. He also indicated that some women went rowing with their husbands, especially next to the coastal line. In case of women and the commercialization of fish, we cannot say anything on this matter, since in this research this topic was excluded.

In respects to age, half of the interviewed fishermen are under 40 years old. It is, therefore, a population widely dispersed in a scale that goes from 20 to the age of 73, with a mean of 42 years. This indicates that the fishing activity is practiced up to advanced ages (six of the interviewees are over 50

years old), but that the youth keep on joining fisheries, in assistance of older generations. Ahead, we will see why fisheries in Boca de Yuma is practiced between a highly disperse age group. We will make out how the same fishermen suggest a possible relation of this phenomenon, to the absence of work opportunities in other fields, among other factors.

In the field of education, the fishermen interviewed confirmed the data of the 2002 national census. In this case only three of the twenty fishermen had more than 8 years of schooling, including one of them who studied medicine up to the second semester, career that he could not continue for lack of resources, according to the information he gave.

Housing

In the case of housing, half of the fishermen are owners of their houses and four live in their parents or grandparents' houses, which indicate that the majority has a roof assured. It is necessary to emphasize that the six remaining ones have no housing; four of them reside in rented houses and two in borrowed houses. The tenants have not lived more than three years in the houses; on the other hand, house owners or those who live in the houses of parents and grandparents have been residing in them for more than twelve years. The majority has been living in their houses for more than fifteen years and eight of the interviewed fishermen have been living in their homes for thirty or more years. On the other hand, half of the homes where the fishermen live are shared with five or more persons. Regarding living space in houses, half of them have from two to three rooms; the other half does not have more than seven rooms. Twelve of the houses have one or two bedrooms and the others three or four bedrooms. According to the Economic Commission for Latin America and the Caribbean (ECLAC) (2004) households "are considered overcrowded when they house three or more individuals per room (excluding kitchen and bathroom)." Practically all the houses are independent constructions, half of which have zinc roofs and a proportion have cement roofs; one of the houses is sheltered with sheets of palm, a material that is of minor resistance to natural phenomena. Regarding the material of walls, half of the houses have concrete walls and another slightly lower proportion has wood walls. The floors are all of cement or another industrial material and none have dirt floors. According to nine of the interviewees their houses are not new, but they are in good condition. The rest of the fishermen consider the opposite, including five of them, who understand that their houses are completely spoilt.

Personal identification and organization

Although in the past the fishermen of Boca de Yuma had an ID card that identified them as such, for years these have been expired and no institution of the Dominican government has renewed them. Amongst it's plans, the Secretary for the Environment and Natural Resources is considering carrying out a census of the fishermen of Boca de Yuma and issuing them identity cards. Meanwhile the fishermen of Boca de Yuma go on fishing without any identity that credits them as such.

Fishermen organization is practically nonexistent, since only one small group of them belongs to a co-operative called COOPEBY, which is oriented only towards economic purposes. Other fishermen do not belong to any type of group.

Economic activities

Seventeen of the fishermen have fishing as a principal economic activity; the other three devote themselves to agriculture, to tourism and to carpentry. Questioned if in addition to fisheries they have another way of subsistence, twelve of them said that they only live from fisheries. For the others, the transport sector, tourism, cooking, construction activities and the harvest of fruits are the alternative means of subsistence to fisheries.

Fisheries and generations

The relation between the years devoted to fisheries and the age of the fishermen, is a very useful fact. It allows us to see clearly that the new generations are initiated in the fisherman's job in Boca de Yuma, generally from 10 years of age. The fisherman in Boca de Yuma is involved from his first years in the chores related to the sea, as one of the interviewees assured, saying that "I have been taking my children fishing with me since they were small". The information of the interviews indicates also that this has not changed across the years. A fisherman with 20 and 22 years of age has already been fishing for ten; from 27 to 34 years they have spent 14 to 15 years in the task. For those with 37, 40 and 41 years of age, they have 25 and 26 years of experience in the sea. Those who are 45 and 46 years of age have gone fishing for 35 years. Those with 49, 50 and 53 years of age have been going fishing for up to 44 years. Those between 56 and 58 years of age, have been fishing for 45 and 47 years and finally, those with 72 and 73 years of age have been fishing up to 61 years.

Work alternatives

These fishermen of Boca de Yuma go fishing fundamentally because there is no alternative work in the community; eight of the interviewees answered in this way. Two others answered that they fish because there do not exist other better paying jobs; or a third one, which indicated that it is more profitable than to do occasional works in the street. At least two coincided that they go fishing because it was what they learned at home; on the other hand, another four alleged that it is with fisheries that they can survive. Of all the interviewees scarcely four said that they devote themselves to fishing because they like it.

One of the questions to the fishermen was if they would stop fishing, if they could have the opportunity to make a living with another activity. To this question only three of them agreed that they would not like to leave fishing. Six said they would abandon the sea because the income from fisheries is very low; four would do the same if they could find other more profitable work. Two more specified that fishing is dangerous and a similar number highlighted that they would leave fishing because there are too many fishermen. Other reasons given by interviewees as to why they would abandon fisheries were health, the hardship of the work and the attitude that "they would do anything to make a living". Those who would not leave fishing based their positions on the ideas that there is no activity more profitable than this one in Boca de Yuma, or because with fisheries they make a living or because they combine fisheries with other jobs to make a living.

As for the future of their children or younger relatives regarding fishing, fifteen of the fishermen would not agree that the younger members of their family will make a living on fishing. Of the five that agree, two of them coincided that they would leave it up to them to make the decision regarding their jobs. The three remaining ones had different opinions. One pointed out that if the kids go fishing they would not become delinquents; a second one indicated that fishing is a family tradition, because his parents had done the same or because ever since his children were small he was already taking them fishing. The reasons for thinking oppositely, were more varied, and they were related to improving life conditions through professional study, the degradation of the sea and the hardness of a life in fishing.

Profits of fisheries

In Boca de Yuma the income obtained from fisheries usually changes considerably. Only one of the interviewed fishermen could not give an approximate sum of his monthly income. Changes in income are expressed in terms of the total amount of money that is earned; the fishermen associate this difference to the season of the year. The average monthly revenue that the interviewees indicated was 291 dollars a month. Half of them earn below 312 dollars a month and the standard deviation is 185 dollars, which reflects a big dispersion in income. Only two of the interviewees thought that throughout the year they earned the same amount of money. The others indicated the opposite, pointing out that in the winter

fishing is more profitable. At least two of them related the lower profitable season to the hurricane season of the Caribbean, which is from June until November. The fishermen think that the principal reason why they have major economic benefits during the winter is due to the fact that fish as well as lobster turn out to be more abundant. What favors the increase of fisheries is the arrival of migratory species. In the same way the fishermen assume, fish who live at the bottom of the ocean go up to the surface of the sea because of the cold. For other fishermen the increase in profit is due concretely to the fact that there abound more species that have higher prices on the market, as lobster or red snapper. Finally, three of the fishermen insisted that the increase of the benefits in the winter period is due to the calmness of the sea, as a consequence of the end of the hurricane season.

The fishing grounds

The majority of these fishermen do not row long distances to go fishing. The places that they frequent most for their daily activity are La Saona Island, the Bay of Boca de Yuma and Cape of San Rafael. Fourteen of them admit that they go fishing in waters that belong to the PNDE, three of whom ignore that in this territory there exist rules for fishing established by the authorities. The others realize that fishing controls exist, although they do not all coincide as to which these are. For some of the fishermen, the regulations are related to the capture of certain species, as the lobster and the queen conch. Also they understand that the capture of juvenile species is not allowed. Others identified the prohibition of going fishing in certain points of the park, as La Saona Island and the channel called Catuano, which separates La Saona Island from the mainland. Finally there was the one who mentioned the restriction of using fishing gears, like the trammel net.

Vessels and fishing gears

The fishing fleet of Boca de Yuma is experiencing an important transformation. Slowly, the traditional yolas, hand-made wooden boats, are being replaced by boats made of fiberglass. In fact, eleven of the interviewed fishermen said that they go fishing in this type of vessel, against seven that still use yolas. According to the fishermen, the fleet of fiberglass boats is in good condition, whereas that of the yolas is the opposite. The fiberglass boat differs somewhat in shape, but also in size in regard to the yolas. While fiberglass boats are over eighteen feet in length, even up to twenty-two, the yolas can be smaller, with a length going from fourteen to twenty-two feet. Seven of the fishermen are owners of vessels, including five fiberglass boats. The remaining vessels are property of the already mentioned co-operative, the fisheries traders established in the village, other fishermen and a woman, whom we mentioned previously. In general the fishing trips are made mainly by two persons. Only one fisherman says that he used to go fishing alone. In another unique case the crew of the vessel is made up of up to five people. In four cases the crew is composed of three persons and in two of four.

Concerning the fishing gears, in Boca de Yuma there exists a tremendous commotion caused by the use of a trammel net, which according to some fishermen goes so far as to occupy up to one kilometer in the sea. This gear is left by his owners in the sea and any marine animal that circulates around is caught, independently of the size. Another similar scandal is provoked by the divers, who are using a halogen sealed-beam in order to fish. According to many of the fishermen, this is a very intensive light that provokes a temporary blindness in the fish in such way, as to allow the diver to catch them quietly. The use of these gears has extremely hazardous consequences on the marine fauna, because it causes them to emigrate, leaving the place a desert sea. As we will see further on, the fishermen of the community attribute many calamities to this trammel net and to the halogen sealed-beam.

Among the fishermen interviewed there are two very widely used fishing gears, which are the hand line and the basket trap, but also the divers use harpoon to capture fish and lobsters and the most specialized, which fish queen conch, use a small ax. Of all the interviewees only one fisherman admitted that he uses the halogen sealed-beam to go fishing, but he did not mention this in the course of the interview. After concluding one of the interviews with one of the fisherman, there started a lively

discussion with a group composed of approximately ten fishermen, who spoke about different topics. The majority of those present in the circle, some who had been already interviewed, showed vehement opposition to the use of the trammel net and the halogen sealed-beam. It was at this moment that one of them admitted that he was using the halogen sealed-beam, maybe pressured by the others, and he remarked that nobody would make him change.

On the other hand, all the fishermen without exception, say they are owners of their fishing gears. In relation to what is their favorite one, twelve named the hand line, five the basket trap and the three remaining mentioned the harpoon. The reasons for the above mentioned preferences vary widely, from the use, pleasure, comfort, practicality, possibility of selection of the prey, safety, productiveness, including the reason that it was the first gear handled. The last response was the most mentioned cause, since four of the fishermen sustained that the fact that they preferred a specific gear was due precisely to the fact that it was the one that they learned to use, while other two said that they grew up using the gears mentioned. Five who prefer the basket trap pointed out that their choice of this gear is due to the fact that this one does not need any effort, because it simply fishes alone. It is convenient to emphasize some responses; like that given by one fisherman, who associated the pleasure when the fish bite to sexual intercourse. Another fisherman, who is keen for the harpoon, pointed out that with this gear he does not need to wait until the fish bite or fall down in a basket trap. On the contrary, he is able to pursue precisely his target species.

Degradation of the marine ecosystem in Boca de Yuma

All the interviewed fishermen agree that there has been a decrease of marine species in relation to when they started going fishing. Even, fifteen of them agree that a crisis of fisheries exists. With the exception of only one fisherman, all the rest coincide that they themselves are responsible for the decrease of the marine species. Thirteen understand that the above mentioned responsibility is linked to the use of certain fishing gears. Eight of them were very categorical on having identified directly the trammel net and the halogen sealed-beam as two of the principal threats to the marine environment in their fishing ground. Practically all are pessimistic with regard to the future of the sea, since nineteen understand that in the future the scarcity will be bigger, whereas the fisherman, who did not coincide with the above mentioned conclusion, does not have any idea of how the marine environment will be in the future. The fishermen have many explanations regarding the future of the marine ecosystem. They understand that fisheries must have some control so that a favorable change can take place in the future. That is why they understand that if fishing gears such as the trammel net or the halogen sealed beam are not eliminated, the future will be worse than the present.

In addition to the negative effect of some fishing gears, three of the fishermen pointed out that the degradation of their fishing ground is due to the indiscriminate capture of species, without taking in account the size or the season “We are only worried about catching”, pointed out a fisherman; whereas another of the same opinion stressed that “we are killing everything”. Twelve of the interviewees said that they are taking measures to avoid the depletion of species of the marine ecosystem. The others do not make anything of this matter. There are three principal behaviors that the fishermen who say they are taking care of the depletion of the marine ecosystem follow. The first is that they condemn fisheries with trammel net and halogen sealed-beam. The second is that they avoid the use of these gears. According to their own words, another additional measurement they are taking is to avoid the capture of juvenile species, and in case of doing it by accident, liberating them.

Formal knowledge of the state of the marine ecosystem

Sixteen of the interviewed fishermen pointed out that they have heard that there are some endangered species in the marine ecosystem, giving examples of some of them, such as the Hawksbill Turtle (*Eretmochelys imbricata*) and the manatee (*Trichechus manatus*), among others. They recognize that those marine species were seen often in the surrounding waters of Boca de Yuma, but now they are

rarely seen. In spite of being informed that there are some endangered species, only one of the fishermen has heard about responsible fisheries. It is not coincidental that the fisherman who has said this is the one who studied medicine; he informed that he heard about this topic in a television documentary.

The disinformation of these fishermen on the topic of responsible fisheries is a part of a situation associated with the absence of formation in fisheries matters. Only two of the interviewed fishermen have participated in courses on fisheries. It is interesting to note that the latter ignore the meaning of responsible fisheries. Despite the disinformation that they have, all of them coincide that it would be positive to be provided with a code of conduct that could guide them in fishing activities. Sixteen of them justified a code, mentioning that to have rules would be good. The four remaining ones pointed out that rules would be good, because in developed countries people follow regulations. Some of the fishermen mentioned above, did not lose the occasion to quote examples known by them, like Puerto Rico, which is nearby to the Dominican Republic, which they praised for the rigid controls that exist regarding the capture of certain species, such as the lobster. They also praised the severe penalty that the Puerto Rican fishermen receive when they violate fishing laws.

The fisheries of lobster and queen conch in the PNDE

The PNDE has been a very important fishing ground throughout history. Archeological studies which have been carried out demonstrate that the economic importance that the queen conch had for pre-Columbian cultures that inhabited the island of Santo Domingo. Vega (quoted by Geralde, 1999), remarks that: "It is interesting to see how the places where the most numerous Pre-Columbian conch piles exist are the same places where, today, the fishermen still dedicate themselves to the same work and create 'modern' parallel conch piles. The place in the country with the greatest modern conch piles is Catalinita Island, between Saona and Boca de Yuma."

Of the group of the interviewed fishermen, twelve of them catch lobsters, four go fishing queen conch and two of them catch both species indistinctly. Eight of the fishermen who catch lobster say that they fish this species for its high market prices; the other four that catch lobster say that it is one of the species that enter the basket traps that they leave in the sea. In the case of the queen conch fishermen, the principal motives for catching it are the high prices and the facility with which this mollusk is placed on the market. One of these fishermen also revealed that the queen conch is a very easy to catch species, because it does not offer resistance. On the other hand, fourteen of the fishermen know of the existence of a ban season for the lobster and/or the queen conch. Although not with due accuracy, these fourteen knew the approximate period of ban season for the lobster. In case of the queen conch, only one said that there is a permanent ban season, as is well known, it occurs in some areas of the PNDE, such as in Catuano Canal. Finally there are other fishermen who do not know when the ban season is and have a mistaken idea about the season. For those who catch lobster, the basket trap is the principal fishing gear, as was said by nine of these fishermen. The harpoon is used by three of them. In case of the queen conch, there is a small ax used to remove this mollusk from the marine platform in the PNDE.

Some final consideration concerning the previews data

The gathered data allows us to make a first approach to what could be some important aspects of fisheries in the community of Boca de Yuma, in the Dominican Republic. This first information does not leave doubts about the type of fisheries that is practiced, which presents most of the features of a small-scale fisheries. We can appreciate in this respect the vessels, the gears, the crews, and the proximity of the fishing grounds and especially the social impact of the activity. As several of the interviewees expressed, it is considered as subsistence fisheries, which is practiced not for the economic well-being, that it produces, but because of the absence of other economic options. It will be very useful in further observations to try to determine if fisheries in Boca de Yuma is an economic activity which could generate some surplus, as Townley (1998) suggests for Malawi. This stage of the study induces us to further analyze the reasons why fishermen keep on fishing: would it be a valid hypothesis to sustain that

this decision is made because they are condemned by social and historical circumstances, which have a concrete expression in poverty? If this hypothesis were true: how does this impact their vision of the marine ecosystem and the resources that they exploit for their subsistence? What values can they share, that could lead them to practice a fisheries that is adequate to the circumstances of the marine ecosystem that they themselves admit is being degraded, and worse still, which they do not expect will improve in the future?

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