

# **Analysis of the perception of fishermen of the National Park of 3 Bays, on the contribution of aquaculture to food security, the fight against poverty and socio-economic development**

## **Análisis de la percepción de los pescadores del Parque Nacional de las 3 Bahías, sobre la contribución de la acuicultura a la seguridad alimentaria, la lucha contra la pobreza y el desarrollo socioeconómico.**

## **Analyse de la perception des pêcheurs du Parc National des 3 Baies, sur la contribution de l'aquaculture à la sécurité alimentaire, à la lutte contre la pauvreté et au développement socio-économique**

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### **ABSTRACT**

Around the world, the thriving fishing industry employs several million people and provides food for trillions. In Haiti, for example, the fishing sector is a socio-economic activity with an important place in the national economy. This is the case in the Caracol bay, where artisanal maritime fishing represents one of the key sectors of the local economy. However, a major phenomenon is likely to deteriorate the stocks of fishery resources: overfishing. Therefore, the objective of this research is to show to what extent overfishing has adverse bioecological effects on parrotfish and sea cucumbers, which are purifying species for the marine environment. Through a mixed (quantitative and qualitative) and transdisciplinary methodology including the assembly of a biometric database with The Nature Conservancy (TNC), in situ scuba diving observations with Reef Check Haiti, focus groups and semi- structured interviews with fishermen and other local actors, the harms of this uncontrolled fishing were observed and discussed in depth. According to the results of the biometric and social survey on the two species studied, overfishing is indeed a major socio-ecological threat for Caracol Bay, as it leads to: the capture of immature species, the reduction of the reproductive potential of the species, the decline of abundance, the use of illegal fishing gear, the degradation of the coral reef and the abusive exploitation of mangroves. This is also linked to the social and economic precariousness of fishermen who unknowingly threaten their means of survival.

**KEYWORDS:** Overfishing, Artisanal Fishing, Parrotfish, Sea Cucumbers, Social Precariousness

### **INTRODUCTION**

Aquaculture represents a rapidly growing sector worldwide, so much so that in 2018, approximately 88 percent (156 million tons) of global fish production was used for direct human consumption. In addition, global aquaculture production reached a new all-time high of 114.5 million tons live weight in 2018 (The State of World Fisheries and Aquaculture 2020, 2020). All this shows the economic and nutritional importance of this sector, especially in small-scale fisheries where local communities live directly or indirectly from fishing and are forced to fish both to supply the local market, but also to feed their families (Measuring the Contribution of Small-Scale Aquaculture, n.d.). This is the case, for example, in Haiti, where more than 72,000 people practice artisanal maritime fishing. Between the quest for survival and ecological pressures, the country's fisheries resources are experiencing unprecedented overfishing, which has been repeatedly described by various national and international experts. The problem of overfishing affects both marine biodiversity, but also makes fishing communities socio-economically vulnerable. This problem has been analyzed in Caracol Bay, which is one of the 3 main bays that form the 3 Bays National Park. To alleviate these difficulties, we suggest that aquaculture is the sustainable

alternative to reduce the impacts of overfishing in the 3BP. The hypothesis is simple, to bring the fisherman to increase and improve his income and feed his family by practicing aquaculture in ponds of certain economically profitable and immune resistant species (Shrimps, Common Carps, Catfish and Tilapia), during the closed season of certain species.

### **METHODOLOGY**

During the month of February 2022, two workshops were held in the municipality of Caracol, on the following topics: overfishing, the closure of the AP3B fishery, the application of a fishing calendar and the co-management of fisheries. These two discussion workshops were carried out mainly with the aim of collecting information on the situation of the fishery, to identify the different fishing periods and to collect proposals for priority activities that will eventually be implemented within the framework of the fishing plan. During the two days of the workshops, a total of 20 participants took part in the activities who are key stakeholders for the fishing calendar and closure plan. These include fishermen's associations, ANAP staff, local authorities (Mayors) and students from the Henry Christophe Campus in Limonade. The selection was made on the basis of their pro-

fessional, scientific and/or political responsibility in the application of the fishing plan and calendar. Each active fishermen's organization in the park sent representatives who participated in all implementation activities during the discussion and exchange workshops. In each discussion group a set of proposals was made by the stakeholders, these are in the plan under the stakeholder comments section.

In order to collect information on, the semi-directive interview survey with open questions was prioritized. On the one hand, fishermen were asked about the fishing situation in the AP3B, and on the other hand, fishermen were asked to propose alternative activities that should or could be carried out to combat overfishing and economic vulnerability. In addition, we also analyzed the different measures put in place by the stakeholders involved in the management of fishery resources in Haiti and in the AP3B. These interviews lasted about 25 to 30 minutes. It was also an opportunity to collect internal bibliographic documents on the situation of marine fisheries and aquaculture. In addition, workshops were conducted in the field in the form of focus groups with local stakeholders. An interview grid in Haitian Creole was developed and distributed to each group in order to collect as much information as possible. Each workshop had a total of 7 to 8 people. Fishermen were in the majority in all workshops, as they are the main stakeholders in the fishing territories and are especially the first ones concerned by and in the implementation of the plan.

## RESULTS

At the end of the workshops, new alternatives were suggested to face the major problems faced by the artisanal fishing sector in the protected area. Thus, aquaculture was suggested as one of the alternative sustainable means to fight against overfishing and as an activity capable of helping fishermen to earn money during the closed seasons. Participants strongly expressed an interest in participating in any activities related to aquaculture. Consider, for example, the opinions shared by an authentic fisherman, well known in Caracol Bay:

*The fishermen of the area honestly state that they have no particular scientific knowledge in fish farming, however, they feel that they would like to participate in shrimp farming practices so that they can earn money. Did you know that seafood traders in the Dominican Republic buy a lot of shrimp in Madras and Caracol through local fishing agencies? We fishermen don't benefit much in terms of money from fishing, because fish are getting scarcer and scarcer and economic life is getting harder and harder. We know that in other countries, like the Dominican Republic, the state and NGOs are investing a lot in aquaculture. This is what we also want in the Protected Area of the Managed Natural Resources of the 3 Bays.*

Remarkably, there is another fisherman from the seaside town of Limonade, who goes further in his reasoning on

the issue, so here is what he thinks:

*In my opinion, imposing a closed season on fishing in the protected area is an important fish management activity, but the most important thing for us fishermen is to have an activity similar to what we are used to doing, capable of allowing us to survive. That's why we think that if we have the capacity to develop aquaculture in ponds, we will earn a lot of money. But in my opinion, we need to focus on economically profitable farming in the local market today, such as shrimp and tilapia. We also need to develop aquaculture projects for new fish species such as groupers and snappers. Believe me, if we manage to produce these fish species in cages or ponds, no fishermen will be interested in the sea. What fishermen usually look for are these kinds of fish because they bring a lot of money. We need such activities in the country.*

On the other hand, other fishermen hope to farm sea cucumbers. This is possible, it will even be an alternative to the overfishing that affects these species. This approach is sustainable because it will allow the exploitation of this resource while the initial stock is in biological rest. The fishermen, once trained in this field, will be able to convert into sea cucumber breeders. During the harvest period, they will increase their income considerably. In some countries such as Indonesia, Seychelles and Madagascar, sea cucumber farming is widely practiced (Conand and Muthiga, 2007). For example, scientists report that a sea cucumber farming project funded by WIOMSA's Marine and Coastal Science for management (MASMA) program was the first concerted effort in the Western Indian Ocean region to understand a range of aspects related to farming this marine resource..

## CONCLUSION

In sum, it seems obvious to understand that the fishermen of the 3 Bays National Park want to change their horizon, and they are constantly sharing their positive perception of the future of fishing. Today it seems crucial to take these things into account in the management processes of the fishery resources in the area. Above all, it is necessary to give the fishermen the necessary means so that they can really discover a source of income superior or comparable to the fishing activity. In my opinion, I believe that aquaculture can contribute sustainably to food security, the fight against poverty and socio-economic development. Nevertheless, in order to bring effective answers to the situation of overfishing which affects the National Park of the 3 Bays in general and the Bay of Caracol in particular, scientific research must be carried out to evaluate the marine biodiversity, the health of the coral reefs and mangroves, the phytoplankton, the socio-economic situation of the fishermen and the impacts of the climate change on the halieutic resources.

**LITERATURE CITED**

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