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ARTISANAL FISHING: A CASE STUDY IN THE COMMUNITY OF CARIPI IN THE MUNICIPALITY OF CAMETÁ-PA

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ABSTRACT

Artisanal fishing is significant for the Amazonian riverside dwellers who have survived from this activity for generations, being the basis of their social and economic reproduction. The research was carried out in the municipality of Cametá in the community of Caripi with fishermen and Community Health Agents (CHA), through visits to homes, monitoring of activities and dialogues about the daily difficulties faced by fishermen. The research identified the problems, initiatives implemented and possible solutions presented by the fishermen themselves and showed the resilience of the fishing community in overcoming the adversities faced. The fishermen were aware that artisanal fishing as it was traditionally practiced does not offer survival conditions for their descendants and future generations. In this sense, initiatives such as the creation of training and preparation courses for youth in fishing communities point to feasible solutions that need support from municipal and state managers.

Keywords: Artisanal Fishing. Water Problems. Neglect of the riverside dwellers.

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INTRODUCTION

Artisanal fishing is an activity that is present in the lives of riverside dwellers, especially in the Brazilian Amazon. This fishing is a heritage of the natives (indigenous) who taught the peoples the importance of fishing activity for subsistence in a sustainable way. Federal Law No. 10,779, of November 25, 2003, institutes artisanal fishing as an activity carried out by autonomous producers or in partnerships within families where their equipment does not use mechanized technologies and their consumption is local (BRASIL, 2003).

Artisanal fishing in the municipality of Cametá is an activity that was greatly affected by the installation of the Tucuruí hydroelectric plant with the flooding of the forests, which caused the decomposition process, making the water acidic. The acidity and multiplication of algae altered the physical and chemical aspects of the water, causing impacts on the reproduction of most fish species, such as: Retention of most fish above the dam, the obstacle to the migration of spawning species (migratory) and increase in waterborne diseases.

According to the BRAZILIAN INSTITUTE OF GEOGRAPHY AND STATISTICS, the city of Cametá-PA, in 2020, has a population of 139,364 inhabitants, (IBGE, 2020). Cametá does not have a sanitary landfill as determined by Federal Law No. 12,305, of August 2, 2010, which institutes the National Solid Waste Policy (PNRS) (BRASIL, 2010). The city has only an open-air dump, it does not have sewage collection and treatment, which are dumped directly into the Tocantins River, thus contributing to more pollution of the river water, harming the riverside dwellers who use the water for consumption, bathing, cooking, and washing bowls and clothes, etc.

Thus, this study aims to investigate the social, economic and environmental difficulties of the fishermen of the community of Caripi and to verify sustainable actions and solutions to alleviate the problems identified.

METHODOLOGY

The locus of the research was the community of Caripi, on the banks of the Tocantins River, located in the municipality of Cametá-PA, approximately 14 km from the city. The community has approximately 150 families, according to information from community health agents (CHA).

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This work consisted on the one hand of the detailed record of fishing activities and the dialogue with the fishermen and the coordinator of the Z-16 colony of Cametá/PA, to identify and analyze the problems and possible solutions to the difficulties faced by the fishermen of the region. On the other hand, the CHAs also provided important information about their experiences with the fishermen's families, based on the survey of registration data.

As it is artisanal fishing, the equipment is simple, somewhat rudimentary, and many of them are made by the fishermen of the locality itself, as shown in the following table.

Table 1 - Most used equipment in fishing and the types of fish caught

Equipment	Type of fish
Matapi	Shrimp and fish
Mesh (net)	Fish
Parí	Shrimp
Cane	Fish
Wall (fixed)	Fish
Cast net	Shrimp and fish

Source: Elaboration by the authors, 2020.

Figures 1, 2 and 3 - Some essential equipment for artisanal fishing

Source: Authors' field research, 2020.

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Figures 4 and 5 - The paddle for hull fisheries on the Tocantins River

Source: Authors' field research, 2020.

The hull and the paddle are still the main means of transport for fishing activity because it enables individual fishing. When the tide is good to put the gillnet (fishing net), as the riverside people say, it is time to pull the hull into the water and venture into the river. The matapis for catching shrimp and fish are usually placed at low tide. To catch shrimp and fish with the cast net, the hoof is not used because it requires a lot of movement when casting the nets. Reed fishing uses the hull, and in the winter period people fish from the bridge because the tides are very high and the water gets murky.

Fishing with shrimp matapi is carried out every day, both in the winter and summer periods in the Amazon. Figure (6) shows the oldest fisherman in the community, 92 years old, in the activity placing the matapi. Despite his advanced age, he carries out his fishing activities daily, in addition to others such as: Weeding, collecting cocoa, raising pigs, and selling his products at the open market in the city of Cametá.

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Figure 6 - Fisherman placing matapi to catch shrimp.

Source: Authors' field research, 2020.

RESULTS/DISCUSSION

In conversation circles with the Coordinator of the Z-16 Colony of the Caripi community, he reported that in the position he has held for approximately 15 years, intense struggles were waged to ensure that fishermen were benefited from the closed season insurance.

> "This insurance is a help to the fisherman, because when the spawning season arrives it is not allowed to fish, so our fishermen need to count on the closed season insurance. Unfortunately, there are fishermen who can't because of bureaucratic issues in the system." (GARCIA, J.N.A. 2020).

According to the Coordinator, the struggle for rights acquired by law is still very large, but little by little this reality has been changing. The first step was to organize the coordination in Caripi after a change in management. Currently, fishermen get some benefits being associated with the Z-16 Colony of Cametá/PA, such as: Sickness benefit, maternity benefit, closed season insurance and retirement.

Regarding the closed season insurance, there is still a lot to improve because the money is hardly released when fishing closes in the period from November 1 to February 28. In addition, the bank responsible for paying the closed insurance is Caixa Econômica Federal, which cannot meet the high demand.

PROBLEMS RELATED TO CLOSED INSURANCE

There are fishermen who due to default are unable to sign the closed season insurance and because of this, they are unable to receive the aid. Another problem is the very deficient system that the Z-16 Fishermen's Colony of Cametá/PA uses to apply for closed insurance. There have been many cases in which the fisherman is listed in the

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system as an employee of a company outside the state without ever having left the municipality, this hinders the receipt of aid.

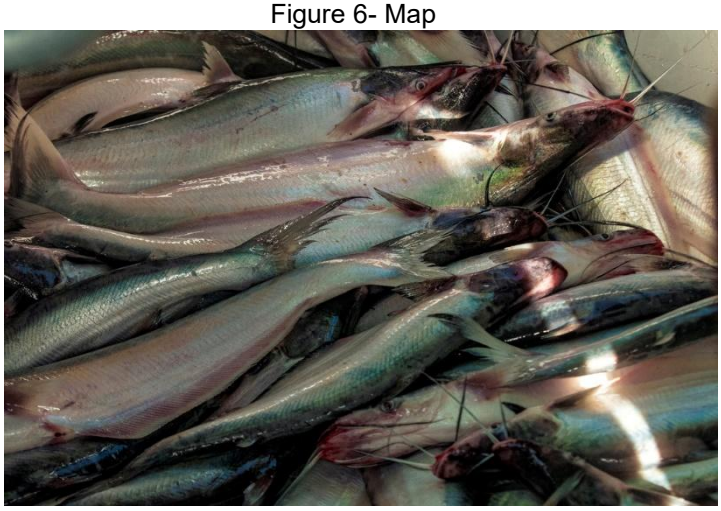
In addition to the difficulties in accessing closed insurance, there are problems in the bank responsible for paying the insurance. When the money is released, the fishermen stand in line at the savings bank for days to be able to withdraw, sometimes they clash with those who will save a place in line to sell vacancies, whose prices vary from 40 to 100 reais per vacancy, which causes a lot of revolt. Public security cannot contain this criminal practice, and much less the President of Caixa Econômica Federal.

ENVIRONMENTAL IMPACTS

In dialogues with the fishermen, it was widely reported that before the installation of the Tucuruí hydroelectric plant, there were several species of fish and in large quantities that fed the families and what exceeded them were sold to buy other supplies. Today, what the fisherman can catch only meets the family's food needs.

The mapará (Hypophytalmusmarginatus) was one of the most affected species, it is one of the foods that are part of the diet of the cametaenses, a fish symbol of the region that feeds on phyto and zooplankton.

Figure 6- Map



Source: Castro, 2023.

In addition to the hydroelectric plant in Tucuruí, there is the issue of the precariousness of basic sanitation in the municipality of Cametá, which contributes to the pollution of the aquatic ecosystem. The table below shows the data from 2010 to 2018 on

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the real situation of sewage collection and treatment from the survey carried out in the (Brazil Sanitation Panel, 2018).

Table 2 - Sewage collection and treatment in the city of Cametá

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sewage collected	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Treated sewage	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Untreated sewage	10.871,00	10.916,00	9.000,00	12.000,00	11.200,00	12.068,00	12.155,00	12.168,00	12.197,00

Source: Brazil Sanitation Panel, 2018.

From the data in table (2) it can be seen that basic sanitation is not a priority in the municipality and that managers do not seek changes in favor of the riverside population that are most affected by the pollution of the rivers. One fisherman reported the following:

> "It's been a long time since our fish practically disappeared, you know, in the past I used to go fishing it didn't take long in the river, now I spend all night to get lunch for my children. In my father's time our lunch was a feast. Sometimes I spend the whole afternoon putting on mesh and come home with nothing. Our river is dying with so much pollution (...) it is very sad for a fisherman who has lived through good times" (Field interview RIBEIRO, J.F. 2020).

This report from Mr. Ribeiro shows the importance and need for care and zeal for the river, as fishermen depend on it for their subsistence and commercial activities and communication. This statement by the fisherman is in line with the National Environmental Policy, instituted by Law No. 6,938, of August 31, 1981, which provides for actions aimed at the issue of preservation of flora and fauna (BRASIL, 1981).

In addition to the drastic decrease in fish in the municipality of Cametá, waterborne diseases are common in the region, which can be verified in the testimony of a fisherman, a family man: "—every year one of my three children gets sick with belly pain and diarrhea, the doctor says that it is from the river water that they drink when they go to bathe" (Field interview, BARROSO, M.P. 2020).

Table (3) shows the number of hospitalizations in Cametá due to waterborne diseases, including diarrhea and expenses for hospitalizations.

Table 3 - Hospitalizations due to waterborne diseases and expenses for hospitalizations

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018
Admissions by diarrhea	813	770	621	718	636	543	701	536	485

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Hospitalizations for waterborne diseases	1.139	1.419	753	758	643	554	718	563	524
Hospitalization expenses	371.859,47	429.829,55	252.275,12	263.519,12	225.801,86	191.260,19	249.189,70	195.392,29	180.066,16

Source: Brazil Sanitation Panel, 2018.

The data in the table above are worrying both in Cametá, as well as for the other municipalities in the lower Tocantins. Despite the socio-environmental problems pointed out and discussed, there are initiatives that aim to mitigate the negative social impacts faced by fishermen in the municipality of Cametá/PA.

FISHERIES AGREEMENT

The fishing agreement in the municipality of Cametá/PA, was published in the official state gazette DOE 35.727, of February 29, 2024, this agreement is a legal instrument that aims to: "the conservation, preservation and maintenance of fish stocks, the environment and the quality of life of communities in the lower Tocantins region" (PARÁ, 2024).

This official agreement is an attempt to mitigate the predatory fishing of specimens in the region, especially the Mapará fifite (cub) that are caught with a size of less than 29 cm. The mapará is the food base of the cametaenses, however, the capture of this species has been happening earlier and earlier, which implies the reproduction process.

Currently, 61 communities are part of the fishing agreement, but many communities were left out of the agreement, as is the case of the community of Caripí. It is necessary to hold informative meetings by the supervisory bodies of the fisheries agreement in order to clarify to the communities the importance and benefits of the agreement, which is allowed and prohibited during the closed season. Working on the sensitization process through guidance and educational material, as well as promoting campaigns can have significant effects.

COMPUTER COURSE

The Z-16 Fishermen's Colony of Cametá/PA, offers computer courses to associated fishermen and their children completely free of charge. This project (Pescando Saber) has been in force for approximately 16 years, during this time many students have already been contemplated with the basic and advanced course.

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Figure 7- Computer Science Course

Source: Silva, 2013.

Many fishermen who completed the computer course got work in the area in pharmacy chains, supermarkets, at the headquarters of the Fishermen's Colony itself in the period of high demand (signing of the closed insurance), in addition, they manage to align themselves in this field when they arrive at university with academic work. According to Silva (2013):

> "The courses generate a new possibility of access to information and knowledge built and made available by society. They enable the construction of a set of knowledge required by social life, as well as by productive life in the world of work. In other words, this knowledge is articulated with social life, generating possibilities of communication with other people and access to a set of information available on the internet".

This project is an initiative of inclusion and opportunity for the less favored, especially for those who do not identify themselves in the profession of fishermen and who seek new opportunities to survive.

PRE-UNIVERSITY COURSE

The Pre-University Entrance Exam course Knowledge Network: Fishing Opportunities was conceived by the Fishermen's Colony of Cametá/PA, with the aim of providing opportunities for fishermen who intend to enter the Public University such as the Federal University of Pará (UFPA) and the University of the State of Pará (UEPA). This project is free to associated fishermen, in addition, most of the teachers are children of fishermen who managed to graduate and now participate in the project to assist students in entering university.

The coordination of the course through the presidency of the Fishermen's Colony manages to pay the teachers' hour/class, it is a symbolic value, but the important thing is

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the intention to contribute with knowledge and make a difference in the lives of students. Some professors from the Federal University of Pará and the State University of Pará are part of this project as teachers and guide the students in choosing courses through vocational tests.

Figure 8 - Inaugural class of the Pre-University Preparatory Course of the Z-16 Colony of Cametá

Source: Fernandes, 2023.

In 2023, the Pre-University Entrance Exam course had 400 students enrolled, of which 120 students were approved in the entrance exam at Public Universities. The number of approved students has been increasing every year and this is giving credibility to the project and, above all, to the Fishermen's Colony because it is an initiative that has been changing and building life stories of each fisherman who fulfills the dream of entering a Public University.

ENVIRONMENTAL EDUCATION COURSE

In 2023, an Environmental Education course was held for the fishermen of Caripi through the Graduate Program in Natural Resources Management and Local Development in the Amazon-PPGEDAM of the Environment Center-NUMA of the Federal University of Pará-UFPA. This course was part of an Environmental Residency activity of the authors of this work.

The course had theory and practice, in the first part the concepts of Nature, Environment, Environmental Problem, Selective Collection, Treatment of Organic Waste, Recycling, Organization of Economic Activities and Collective Awareness were worked on. In practice, homemade soap was manufactured with the reuse of cooking oil and home composting with a technique for the treatment of organic waste.

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As a result of the Environmental Education course, a group of women began a process of self-organization to manufacture homemade soap from used oil and chicken fat. Initially, the manufacture was for their own consumption and then they started selling in the neighborhoods and thus, they were expanded to the nearest communities.

The collection of chicken fat oil has been going on for more than a year in the community of Caripi, this is largely due to the course, but it is also the result of the awareness that the group has been carrying out with fishermen. This change in attitude proves that Environmental Education has a positive effect when it works with the local reality, reconciling empirical knowledge, theory and practical activity that has the potential to generate income.

FINAL CONSIDERATIONS

The research showed that the socio-environmental problems faced by fishermen need attention from the government, by the Z-16 Fishermen's Colony of Cametá, as well as by community leaders in order to demand Public Policies, Programs and Projects that meet the demands of fishermen.

The fishing agreement, the computer courses, pre-university entrance exams and the Environmental Education course are some alternatives for improvements and opportunities for fishermen, but more efforts are still needed to promote significant changes.

Fishermen demonstrate the capacity for resilience by creating alternative activities to face social, environmental, economic and political problems. However, it is urgent that there is a counterpart from municipal and state managers in supporting the initiatives created by fishermen.

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