

Law of Fishing Prohibition: The Impacts of the Piracema Period on the Artisanal Fishing Economy in the State of Santa Catarina

Luiza Vianna de Abreu Barreto^a

^a Law School, Complexo de Ensino Superior de Santa Catarina - CESUSC, Florianópolis, State of Santa Catarina, Brazil, luiza.vianna@faculadecesusc.edu.br.

Abstract. Artisanal fishing is of greater importance to the economy in the State of Santa Catarina, Brazil, where this category of fishing represents a substantial local fishing production due to the several rivers that exist over the State and allows the growth of many fish species. Although there is a period called Piracema, which is equivalent to the spawning season, which makes the fishing activity forbidden during this time of the year. Thus, this season is followed by State and Federal Regulations that make the fishing prohibited and purpose control all fishery activity throughout this period. This study aims to display the fishing prohibition legislation and discuss its importance for the maintenance of fishing preservation on the environment and its impacts on Artisanal fishermen in the State of Santa Catarina who only have the fishing as a labor economy. In this last situation, the study reveals the unemployment insurance for fishermen during fishing prohibition developed by the Santa Catarina's government to minimize the financial damages that happen to the fishermen as well as the methods used for fishing and types of fish that are possible to angling during the Piracema season while the fertilization and development of the fish happen in the environment. Furthermore, the methodology used in this work was the literature review, which was based on secondary data collection from educational institutions, governments, archives, and legislations, among other sources listed in the references.

Keywords. Piracema, spawning season, artisanal fishing economy, State of Santa Catarina, Brazil, law of fishing prohibition, sustainability.

1. Introduction

Generally, the spawning season is a period followed by plenty of legislation restrictions with the intention to protect the native species of fish. Because the human population does not follow the fishing restriction during this stipulate time, this can lead to a huge imbalance in the environment in the region.

On other hand, the problem with the law of fishing prohibition during the fish fertilization season, as known as the Piracema period in Brazil, is in the local economies where Artisanal fishing is of higher importance. So, it is of great concern to know how the fishermen could be able to subsidize over this season.

This situation is seen in the State of Santa Catarina, localized in southern Brazil.

That way is extremally necessary to find an alternative option for the local community of fishers

so they can continue subsidizing themselves during this period.

Therefore, the present work focuses to disclose the importance of the Piracema to ensure the fish species will properly spawn and repopulate the rivers and how the fishing restrictions affect the local Artisanal fisher economy pointing out other options the Artisanal fishermen have to subsidize during the Piracema period.

To develop the current research, the methodology used in this paper was the literature review based on secondary data collection, which was constructed by educational institutions, governments, archives, and legislations, among other sources.

2. The definition of “Piracema” and its

Duration in the State of Santa Catarina

2.1 The Definition of “Piracema”

The word Piracema originates from the Tupi language which means “fish exit”. The Piracema is the movement which the school of fish make against the current, swimming upstream river to headwaters to spawn their eggs (Cremonesi 2015).

As described by Alho et al. (2011) in their explanation the “piracema” is a form of migration, teaching that the schools of fish move upstream at the beginning of the rainy season. Other migratory fish species leave the riverbed and move into the adjacent flooding areas in search of food.

This moment occurs due to environmental variations such as the rise of rain and the water temperature which normally happens in the summer (Ferreira 2020).

Thus, the Piracema is the period of fish reproduction, which is also is when fishing is forbidden, as will be further explained later.

2.2 Duration of the Piracema Period in Santa Catarina

The Piracema’s period can vary across different regions of Brazil.

Therefore, the Piracema’s period depends on each river basin district and it lasts differently according to the types of fish, but customarily happens between November until February (Cremonesi 2015).

In that way, it is necessary to consult the information made available by Brazilian Ministry of Fisheries for an accurate restriction period in river basin.

Is the main focus of this study is the State of Santa Catarina region, it is worth stating the Piracema’s Period in Santa Catarina usually starts on October 1st until January 31st (Federal Government, 2021).

3. The Importance of Piracema and its Impacts on Fishing

The spawning is the time when freshwater fish rise against the currents of rivers to spawn, correspondingly is understood that is the period of fertilization and development of the fish, so that the life cycle remains functioning (Santos 2021).

Therefore, it is a very important season for the species of fish to reproduce and it must be respected. Consequently, the fishing is restricted during the Piracema’s period because if the fish struggle during the reproduction they could be extinct and there will not be anything to fish resulting in a great risk of

environmental imbalance in that region (Santos 2021).

The same author (2021) explains that the headwaters is the location where the early born fish have a greater chance of surviving. Also, when fishing is restricted in this season it allows their development and permits the natural life-cycle for the continuance of fishing.

Ashikaga et al (2017) explains that the excessive exploitation of freshwater resources has been caused by several impacts on natural populations, especially on fish. As such different factors related to pollution or overfishing can cause changes on the current fish populations and interfere with their equilibrium. In this context, *Brycon orbignyanus*, popularly known as “piracanjuba”, is an endangered fish species affected by overfishing as aforementioned.

Another reason for the fishing restriction during the spawning season is the high concentration of fishes going upstream all together which makes them easy prey. A single fishnet capture a whole school of fish. Accordingly, if thousands of fishermen do not follow the fishing restriction at the same time in the spawning season, this can lead to a huge imbalance in the region (Santos 2021).

Thus, the main goal regarding the fishing restriction is to ensure the fish species will properly spawn and repopulate the rivers.



Fig. 1 - Photo of a “*Brycon orbignyanus*” as known as Piracanjuba fish (LausPesca, 2019).

4. The State of Santa Catarina and the Artisanal Fishing Economy

4.1 The State of Santa Catarina

Santa Catarina is a Brazilian State located in the southern region of Brazil. The main capital is an island called Florianópolis.

The state borders with the state of Paraná (to the north), the state of Rio Grande do Sul (to the south), Argentina (to the east) and the the Atlantic ocean is on the west side (Kreutzfeld 2012).



Fig. 2 – Localization of Santa Catarina in Brazil (PrePara ENEM 2022).

The most important rivers of the state are Iguaçú, Itajai, Pelotas, Chapecó and Canoas. These last three are tributary from the Uruguay River (Pacievitch n.d.).

The Uruguay River basin is the largest in the state of Santa Catarina and it has the greatest diversity of fish (FAPESC 2012) which has provided the fishing economy as is shown in the next section.

4.2 The Artisanal Fishing Economy in the State of Santa Catarina

According to eighth Article of the Law Nº 11.959/09 (Fishing Law 2009), artisanal fishing is a type of commercial fishing which is practiced by a professional independent fishermen or in the regime of family economy with its own facilities and small vessels.

Just a decade ago the artisanal fishing in the State of Santa Catarina was of great importance for the state, which represented 30% of the local fishing production (Severo 2008).

Regarding artisanal fishing, it is important to mention that the small-scale artisanal coastal fisheries are widespread and have a very great social importance on the economy in developing countries, being a reliable and primary source of income and animal protein for families of fishermen (Begossi et al. 2010).

For example, in the city of Navegantes, their municipal government (2020) asserts that Artisanal Fishing is the engine of the local economy involving a practice focused on small boats, such as canoes and “bateira” (a small open fishing boat), which belong to the local families.

The same source (2020) reported which types of fish are more common species on Itajaí-Açu riverbanks such as Robalo, Manjuva, Bagre, Jundiá, Taraira, Cará, Saguaru, Piava, Carpa, Tilápia, which involve cast nets, fishing hooks and fishing rods.

Therefore, artisanal fishing activity in Santa Catarina

occurs throughout the year with the exception of the seasonal closure (Della Giustina et al. 1996).

5. The Spawning Season Protection Law and its Exception in the Piracema Period

5.1 The Spawning Protection Law

Some regulations were performed by the Legislative Power (Federal and State levels) in order to respect the environment and to attempt the protection of species. As well as avoiding the overfishing imbalance, there are laws to improve the fishing regulation during the Piracema period as demonstrated in the following explanation.

First of all, the sixth Article of the Federal Fishing Law Nº 11.959/09 authorizes the fishing prohibition momentary or permanently when it aims to protect the species, regions, endangered ecosystems, maintain a reproductive process, or preserve the fishing (Federal Fishing Law Nº 11.959/09).

The above-mentioned Law (Federal Fishing Law Nº 11.959/09) in the first Article enacts its foundations and targets such as the fishing sustainable development as food supply nourishment, employment, leisure, and income, guaranteeing the fishing sustainability harmonic with the safeguarding of the environment and biodiversity, fishing socio-economic development and its fiscal surveillance.

Like that, the Law nº 7.653/88 refers in particular to the Piracema Period, observing that is prohibited any type of fishing in the watercourses during the aforementioned season or in any other location while occurs the spawning or fish reproduction.

Furthermore, it is possible to note the Federal Law nº 9.605/98 which provides criminal and administrative sanctions to whom prejudice the natural environment, including fishing during the prohibition season.

Lastly, the State of Santa Catarina has its fishing State policy Law (Ordinary Law nº 18.189/21) which establishes its main goals, the definition of fishing, the types of fishermen, and the fishing prohibition during spawning season.

5.2 Exception of the Regulation

Even though there are the regulations and warnings for the fishing prohibition during the spawning season, it is possible to fish in certain modalities and particular ways.

The Normative Instruction Nº 25 of September 1st, 2009 allows the fishing activity during the spawning season in rivers basins only when is used reed, windlass, or similars methods are used to capture

non-native fish or hybrids such as Tilápia (*Oreochromis spp. e Tilapia spp.*) and Zoiudo (*Geophagus surinamensis e Geophagus proximus*).

The amateur fisherman can capture up to ten kilos, otherwise, the professional fisherman is allowed to capture unlimited non-native species (Normative Instruction nº 25 2009).

Accordingly, the capture of fish which are not native to the basin, called exotic species, are released.

6. Unemployment Insurance of the Closure Fishing Season for the Artisanal Fishermen

Once the fishing prohibition period starts, the fishers can not continue their activities as usual. Even though it is only a determinate period of suspension of fishing activity during the reproductive period of the fish, it consequently affects the fishing local economy.

Thereby, to assist the Artisanal fishers who had their activities interrupted, the Federal Government grants an allowance similar to the Unemployment Insurance, which lasts a few months (Rodrigues 2000).

Rodrigues (2000) emphasizes a few biggest issues about this assistance such as the fact that mostly is not released at the required time and the Artisanal fisher is necessary to comply with a lot of conditions such as being registered on Brazilian Institute of Environment and Natural Resources (known as IBAMA) and being an associate member of the local fishing colony.

Therefore, to conclude, Franco (2021) instructs that the Unemployment Insurance is a benefit given to the Artisanal fishermen during the fishing closure period for those who cannot fish due to the fish species protection.

7. The Artisanal Fishing and the Sustainability

To ensure the maintenance of fishing, nowadays, sustainability is an essential feature in any human activity which affects the exploration's resources with a limited intensity that allows satisfying the needs of current generations and at future ones at the same time.

There are a vast of problems that affect artisanal fishing for example the natural phenomena (moon phases, winds, tides, and rains), also the growth of the global economy, and the pollution of the water caused by garbage, among other factors (Rodrigues 2000).

Ana Rodrigues (2000) confirms that those facts conduct in higher competition for the available resources, however, artisanal fishing enables the subsistence of the fishing community.

Otherwise is important to note the local tourism impacts on fishing. Tourism has two sides: The first is the negative impact on the local fishing community, once they increase the competition for fish and often do not consume the fish captured by the artisanal fishermen, and also contributes to real state speculation in the region what makes the fishermen more vulnerable about their residence and work facilitating their expulsion. The second and the good side of tourism is that they provide financially for the region (Rodrigues, 2000).

About that Borghetti (2000) clarifies that the sustainability of fishing resources on the basins depends on alternatives that consider collectively the social aspects, as well as economics, technologies, and environment to balance the needs and limitations to establish the principle of the sustainable social market economy - which avoids the excessive exploration of the environment and preserve it.

Thus, as reported Torres (2003) to achieve the development economically feasible for humanity is required long-term planning and the understanding that natural resources are limited.

8. Conclusion

Based on all facts exposed, this report aimed to answer the impacts of the fishing prohibition regulations on the artisanal fishing economy in the State of Santa Catarina, Brazil, while discussing the importance of that legislation for the species of fishing preservation.

Firstly, it is crucial to retake the economical importance of fishing in the State of Santa Catarina, where artisanal fishing represents a substantial amount of the local production and is the engine of the local economy.

However, there are regulations performed by the Federal and State legislative power to attempt the protection of species to avoid the overfishing imbalance. Which prohibited the fishing during a season of the year called Piracema, the spawning season.

Despite the laws focused on the respect for the development of the fish it is important to mention the artisanal fishermen in the State of Santa Catarina only have the fishing as a labor economy and the spawning season causes a suspension of fishing activities.

Therefore, this study aims to show the importance of the Piracema Period for the maintenance of fishing and point out other options the artisanal fishermen have to subsidize themselves during the Piracema period.

After all the literature reviews it is possible to conclude that fishing is prohibited during the Piracema period to enhance the fish reproduction and maintain species, thus, the spawning period ensures the natural cycle of reproduction of aquatic life in rivers, ensuring that there are always fish to maintain the food and income of thousands of Brazilians fishermen in the State of Santa Catarina, as well as guaranteeing a sustainable environment.

Furthermore, during the Piracema the artisanal fishermen can fish non-native species using reed, windlass, or similar methods and demand unemployment insurance from the Government over the spawning season to minimize the financial damages.

Accordingly, it is straightforwardly needed the application of fishing prohibition regulations during the spawning season, once the overfishing or the inconsequential fishing can lead to massive losses and restrict the fishing for good in a region.

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