

Valenca Canoe Fishery

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1 Part I: Static Analysis - Collective action

This case covers the Valenca fishery in the northeastern part of Brazil, focusing on the traditional canoe fishers. At the time when the case was studied, there were around 48,000 people living in the town. In the 1950s, Sudepe, the national fishery development agency, attempted a fishery modernization initiative by introducing nylon nets (stronger than the cotton-fiber nets traditionally used) in fisheries where communities were considered marginalized. Valenca was selected as a location for this modernization initiative, with traditional canoe fishers being the main target. However, the financial costs of nylon nets prohibited traditional canoe fishers from purchasing them, and instead the beneficiaries of the nylon nets were four local entrepreneurs with no previous direct experience with fishing. The increased number of resource users for the same resource raises questions over the ability of the fishing grounds to sustain the fishers. Even more so, the introduction of new hard human-made infrastructure changed the social and knowledge infrastructure that the traditional canoe fishers had previously utilized, bringing into question how the modernization initiative affected traditional fishers and if the objective of the initiative was met.

This case illustrates how external drivers can lead common-pool resources systems to failure by affecting their social and human infrastructure.

1.1 The Commons Dilemma

The introduction of nylon nets to the Valenca fishery increased competition within the fishing grounds. This change resulted in new resource users within the fishing grounds, while the resources available raised the same. Thus, it is reasonable to consider whether modernization attempts resulted in overfishing. According to Cordell, this question cannot be answered simply, as the environmental conditions of the fishing grounds complicate the assessment of fish stocks. Even if stocks remain at a reasonable level, where fish are located and the number of fish in each area are limiting factors; some areas are easier to fish, and certain areas cannot sustain the same level of competition as other areas. The overall conclusion seems to be that although modernization attempts increased competition in the Valenca fishing grounds, they did not necessarily harm the fish stocks.

This is not to say that the introduction of nylon nets had no impact on the system. Indeed, their introduction clearly resulted in adverse social and economic consequences for traditional canoe fishers, affecting social and knowledge infrastructure. Increased competition limited the success of traditional canoe fishers in the area, forcing many to revert to subsistence fishing and move their dwellings to less-desirable swamp areas. The result was not

necessarily ecological degradation but rather a loss in social and economic status for these traditional canoe fishers as they saw their position in society lowered.

1.2 Biophysical Context (IAD)

- **Natural infrastructure**

The fishing grounds are located within a tropical estuary, a water channel enclosed by Brazil's mainland and three islands. The fishing grounds consist of three main subdivisions: *bôca de barra* (mouth), canal (main body), and mangue (head). During the summer seasons, fishing is viable outside of the estuary, with areas within the estuary called *beirada do canal* and those outside of the estuary called *beirada de sul* (fishing grounds south of Valença). Within *beirada de sul*, fishing may occur along the beach that fronts the village of Guaibim (a *costa*) and within the inshore reef areas outside the island of Tinhare between the villages of Morro and Garapua (mar *perto*). Fishing is heavily affected by the tides and currents, defining what fishing techniques are required and the location of different marine species related to tidal zones. Fish largely represent a mobile resource, although their feeding and spawning grounds remain largely fixed.

- **Hard human-made infrastructure**

Most of the hard human-made infrastructure is in the form of private infrastructure. Canoe fishers own hard human-made infrastructure in the form of canoes and various fences, nets, corrals, traps, and trot lines required for different fishing techniques. These techniques include *camboa costeiro* (mangrove fences), *tapa-esteiro* (lift net), *redinha* (dragged nets), *rede grande* (dragged nets), *calão* (encircling nets), *tresmalhos* (encircling nets), *camboa pau e pic* (fish corral), *araiera* (gill net), *munzua* (fish traps), *groseira* (trot lines), and *espinhel* (trot lines). *Rede grande* and *calão* are the most preferred methods but also require the highest level of skill. Besides canoes, sailboats may also be used by wealthier, non-traditional fishers. Additionally, nylon nets were introduced as private hard human-made infrastructure in the 1950s. Nylon nets were largely owned by wealthy entrepreneurs with no previous direct experience with fishing; traditional canoe fishers did not own nylon nets and continued to use other forms of hard human-made infrastructure even after their introduction. As a consequence, a local factory foreman that could afford the nylon nets proved to benefit the most from the introduction of this tool.

1.3 Attributes of the Community (IAD)

- **Social Infrastructure**

Traditional canoe fishers operate on a system of *respeito*, the unofficial ethics guidelines that define fishing etiquette. *Respeito* represents the self-regulation of the traditional canoe fishers, as there are no official regulations or monitoring in place for the fishery. Overall, the fishery runs with a strong sense of both competition and cooperation among traditional fishers. Fishers aid one other with the idea that aiding others will result in aid for oneself. After the introduction of modernization techniques, the importance of *respeito* began to decline. Additionally, the use of nylon nets resulted in increased competition and decreased cooperation. The new fishers did not follow the

unspoken agreements that were previously in place, and the comradery that the traditional fishers had previously enjoyed declined. Instead of one group – the traditional fishers – dominating the fishery and following their own rules, there were now two groups in place: the traditional fishers and fishers who worked for the entrepreneurs. The social infrastructure deteriorated with the introduction of the nylon nets.

- **Human Infrastructure**

Knowledge related to the tides, currents, moons, locations of certain marine species, and proper fishing techniques based on environmental conditions is required in order to successfully fish in the estuary. Only those who know to choose the proper technique for each condition, season and time of the day and are skilled at them are able to succeed. As with social infrastructure, the introduction of the nylon nets diminished the importance of soft human infrastructure in the form of knowledge infrastructure.

1.4 Rules in Use (IAD)

1. Position Rules

- Traditional canoe fishers: there are two groups of traditional canoe fishers, the older traditional canoe fishers and younger canoe fishers.
- Sudepe: The Sudepe is the national fishery development agency (PIP). There is no indication that any traditional canoe fishers were a part of the Sudepe nor that any residents of Valença were represented by the agency.
- Fisherman’s guild: the guild was largely made up of wealthier sailboat fishermen with a higher social status and political involvement.
- Nylon nets users: Only four local entrepreneurs could afford to purchase the nylon nets, all of whom had never been directly involved in fishing before. They were a local tecido merchant, two fazendeiros, and the foreman of the textile factory Companhia Valença Industrial.

2. Boundary Rules

- To become a traditional canoe fishers, one need to either be a descendant of other canoe fisher or to be taught how to fish by an old canoe fisher. Before modernization, access largely limited who could fish in the area as fishing required intimate knowledge of techniques and tides. Older traditional canoe fishers possess the knowledge required to be successful at fishing in the area and thus were able to control who could fish, as younger fishers could only be successful if they served as an apprentice for older fishers. However, with the introduction of the nylon nets, younger fishers were better able to compete with older fishers.
- Sudepe: to be an agent of Sudepe, one would probably need to go through a written test and expertise evaluation (Public Service Competition) to get the position as an employee of a public agency.
- Fisherman’s guild: membership in the guild requires the payment of dues, which traditional canoe fishers cannot afford.

- Nylon nets users: only requirement is to be able to afford nylon nets. Nylon nets were mainly available by purchasing through private investors, who were provided the nets through the Sudepe and sold the nets on a profit-sharing basis. Some nets were also available for purchase directly. While it was hoped that the traditional canoe fishers would benefit from the availability of nylon nets, only the entrepreneurs purchased nylon nets.

3. Choice Rules

- There are no official rules governing who may fish, where and when fishing may take place, or how one may fish.
- Between traditional fishers, if a fisher wants to lay claim to a fishing spot, he must make the claim several days in advance public (publicando o lanço) by announcing this intention in a local bar where the fishers congregate. The fisher must then anchor his canoe in the intended spot the day before he intends to fish with the paddles in the air, thus indicating that the spot has been claimed. This is not an official system but is rather an informal agreement governing traditional fishers' system.

4. Aggregation Rules

- Decisions made by the fishers on who may fish, when and where, were based on an informal group decision, with no specified aggregation rules.

5. Scope rules

- None specified.

6. Information Rules

- The size and location of the fishing grounds are such that fishers can easily monitor one another and see where others are fishing and when. There are no official authorities who monitor the system.
- Traditionally, older canoe fishers were in possession of the knowledge needed to successfully fish and passed it along to younger canoe fishers who served as apprentices, although they could be selective about who received the information. With the introduction of nylon nets and the introduction of entrepreneurs fishing in the area, the importance of this knowledge decreased.

7. Payoff Rules

- There are no official penalties as there are no official rules in place that govern who, how, where, or when one may fish. Instead, there are individual rewards and largely collective penalties, although these are not officially sanctioned. Individuals have an incentive to fish more, as this translates to more food and/or money. However, there is a large difference between payoff for traditional canoe fishers and wealthier fishers, including the entrepreneurs who entered the system with the introduction of the nylon nets. Traditional fishers are fishing for subsistence; while fishing was previously financially important to them, the introduction of new resource users limited their capacity to earn money through fishing. Wealthier fishers, on the other hand, stand to make more money by

harvesting more fish. Potential overfishing would result in fewer fish available for all fishers, although the traditional canoe fishers would stand to suffer the most.

1.5 Summary

The overall conclusion seems to be that although the modernization attempt did not necessarily harm the fish stocks, it did result in adverse social and economic consequences for traditional canoe fishers, who were largely excluded from the decision-making process. Additionally, traditional canoe fishers – the intended group for modernization processes – were unable to utilize the nylon nets because of financial barriers. The approach taken was flawed, and even a delay of a few years may have prevented the negative consequences that resulted. However, the largest weakness was the lack of connection between the traditional canoe fishers (RU and local scale PIP) and Sudepe (national scale PIP).

Another result of the modernization effort was that it changed the rules in use and revealed that some of the rules seem to be poorly defined. While there are rules for who can belong to the fisherman’s guild, there are not clear boundary rules on who can fish in the area, penalties for overfishing and how the traditional fishers interact with the guild and the Sudepe. Because there are no official rules (and very limited unofficial rules) determining who can fish in the area, this translates to a lack of regulations concerning how much one can fish and at what time. The system used by fishers based on *respeito* works well for a closed community, but diminishes in effectiveness when outsiders are introduced, as these outsiders do not necessarily respond to these rules and may have resources to get around them. This way, the tides, as opposed to governance, seem to dictate how much fishing can be done and when more than anything else. As a result, this represents a true commons dilemma; there is individual incentive to harvest as much as possible, but overharvesting harms the whole group.

It can be concluded that the modernization effort was not successful, not because it degraded the fish stocks but because it severely harmed the traditional canoe fishers, the very community it was meant to aid.

2 Part II. Case Contributors

- Livia Cruz, School of Life Sciences, Arizona State University.
- Kayla Tarr, School of Sustainability, Arizona State University.