

Shellfish Farming and Usage Conflicts in the Bizerte Lagoon: Crossed Perceptions of Shellfish Farmers and Small-Scale Fishermen

Racha Sallemi¹ 

¹University of Manouba (Tunisia), Laboratory of Diversity, Management and Conservation of Biological Systems, LR18ES06, Faculté des Sciences de Tunis, Campus Universitaire, 2092 EL Manar, Tunis, Tunisia

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***Corresponding author:** Racha Sallemi

University of Manouba (Tunisia), Laboratory of Diversity, Management and Conservation of Biological Systems, LR18ES06, Faculté des Sciences de Tunis, Campus Universitaire, 2092 EL Manar, Tunis, Tunisia

Abstract

This study examines the socio-ecological conflicts and usage dynamics between shellfish farmers and small-scale artisanal fishermen in the Bizerte Lagoon, Tunisia. Using a qualitative approach based on ten semi-structured interviews conducted in 2026, alongside direct field observations and institutional analysis, we investigate the root causes of the structural tensions that culminated in a severe episode of vandalism in November 2019, where mussel-farming installations in Menzel Abderrahmane were systematically destroyed. Our findings reveal three primary dimensions of conflict: (1) a causal dispute regarding the origins of lagoon pollution, where fishermen blame shellfish farming for ecological degradation while farmers point to external industrial and domestic waste; (2) unequal institutional recognition, with both groups feeling abandoned by state authorities; and (3) a clash of incompatible temporalities between historical, traditional fishing rights and modern, long-term aquaculture investments. Rather than a mere material resource competition, this situation represents a profound conflict of recognition. We propose a shared governance framework based on marine spatial planning, collaborative environmental co-diagnosis, and the establishment of permanent multi-stakeholder mediation platforms to transition from destructive conflict toward sustainable, integrated coastal zone management.

Keywords: Shellfish farming, Small-scale fisheries, Usage conflicts, Bizerte Lagoon, Governance, Recognition.

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1. INTRODUCTION

The rapid development of aquaculture on a global scale has, for several decades, constituted a major driver of economic growth in coastal areas and a recognized lever for the food security of coastal populations (Agúndez *et al.*, 2024). However, this expansion faces an increasingly restrictive social and territorial reality: the scarcity of available maritime space, the diversification of uses, and the persistence of historically established access rights. In the Mediterranean basin, where pressure on coastal land is particularly strong, the cohabitation between aquaculture and small-scale fishing is frequently conflictual. Aquaculture operators are often perceived by other users as a source of pollution and damage to fishing gear, while they claim to be "sentinels of the coastal environment" (Rey-Valette *et al.*, 2008). Recent studies show that these tensions do not only stem from material competition for resources, but also reflect divergent visions of their relationship with the sea, their profession, and the territory (Racionero *et al.*, 2020). In such a context, understanding conflict dynamics becomes a first-rate

scientific and political issue to devise effective coastal zone governance.

Located on the southern shore of the Mediterranean, the Bizerte Lagoon illustrates this structural tension with particular acuity. As an important socio-economic hub of northern Tunisia, the lagoon concentrates a plurality of activities on its shores and in its maritime space: coastal fishing, shellfish farming, commercial shipping, military activities, recreational fishing, and water sports (Hamdaoui *et al.*, 2022). Although these uses have long coexisted, their gradual intensification has brought to light disagreements, sometimes latent, sometimes overt. This culminated in November 2019 in a critical episode of vandalism specifically, the arson and complete destruction of the shellfish farming installations of Menzel Abderrahmane by groups of fishermen. Beyond the immediate material shock, whose financial magnitude and symbolic significance will be documented in Section 5, this event marks a threshold in the lagoon's conflictual trajectory: it makes visible on a large scale a neighborly hostility

that had previously been diffuse, and its non-recognition by the authorities has turned it into a lasting point of crystallization of conflict (Hamdaoui *et al.*, 2022). The study of these dynamics in the Bizerte Lagoon is of

particular scientific interest because this southern Mediterranean territory offers a prime observatory of ongoing socio-ecological changes in coastal areas in transition (Yahyaoui, 2018).

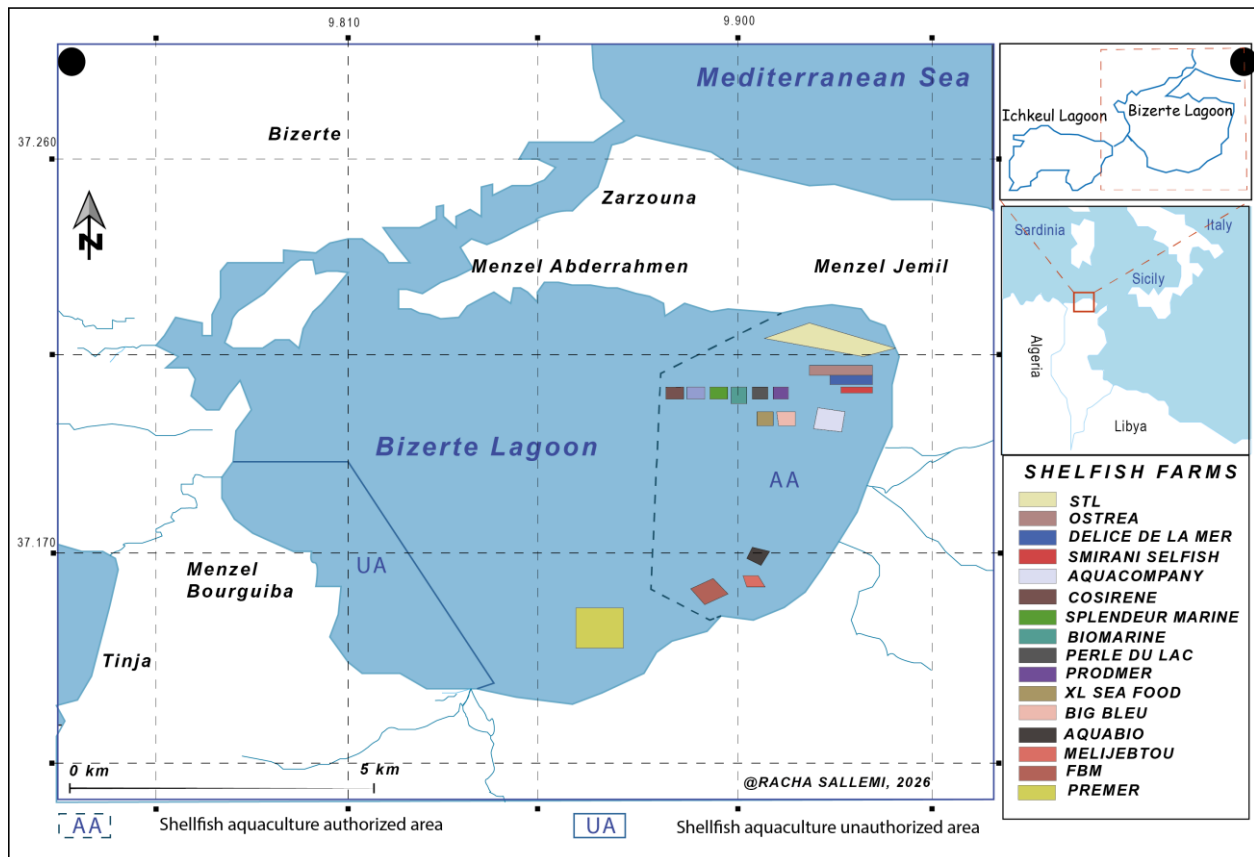


Figure 1: Distribution of shellfish farms in Lake Bizerte in 2022

Data source: Ministry of Agriculture and Water Resources, 2023

The multiplication of uses in a restricted space prompts us to examine the conditions for sustainable cohabitation, especially since Tunisian public policy struggles to coordinate sector-specific development imperatives with the recognition of traditional usage rights. Research conducted on Mediterranean wetlands has shown that usage conflicts, far from being limited to a sectoral dimension, reflect governance challenges, power asymmetries, and differentiated relationships with the territory (Cadoret, 2013). Analyzing these conflicts thus allows us to go beyond a strictly competitive reading to uncover the complex web of opposition between fisheries, as well as between categories of actors and institutions (Cadoret & Beuret, 2022). Building on these works, this research is positioned within a social geography of the environment and political ecology perspective, which is attentive to the meanings that actors attribute to their living and working spaces.

Problem statement and objectives

The main objective of this study is to analyze the perceptions and conflict dynamics between shellfish farmers and small-scale fishermen in the Bizerte Lagoon,

based on a qualitative field survey. More specifically, it aims to: (i) identify the structural and interactional factors that fuel conflict between the two groups of users; (ii) characterize the divergent representations regarding the lagoon environment, the resources, and professional practices; and (iii) examine the capacity of existing institutional mechanisms to address these tensions and foster shared governance (Sallemi, 2025). By linking these questions, the article seeks to determine to what extent making conflicts explicit can serve as a lever to rethink the management of the lagoon territory, rather than a mere blockage calling for top-down technocratic responses (Cadoret & Beuret, 2021).

On a methodological level, the research is based on a qualitative survey using semi-structured interviews conducted with shellfish farmers and small-scale fishermen operating in the Bizerte Lagoon, complemented by field observations and the analysis of institutional documents. This approach makes it possible to gather the actors' views and access the symbolic and identity dimensions of the conflicts, which are often

obscured by strictly sectoral approaches (Martínez-Novo *et al.*, 2016).

2. Theoretical framework

2.1. Management of the commons

This research is situated within the theoretical framework of the management of the commons, as formalized by Elinor Ostrom and expanded in the environmental social sciences. Indeed, the Bizerte Lagoon can be understood as a common-pool resource, i.e., a renewable resource where access is neither fully excludable nor rivalrous (Rey-Valette *et al.*, 2008). According to the framework of Rey-Valette *et al.*, the sustainable development of coastal aquaculture systems depends on the capacity of local actors to collectively build institutional mechanisms capable of linking economic exploitation, social equity, and ecological preservation, within a multi-level territorial governance approach (Rey-Valette *et al.*, 2008). As Pérez Agúndez *et al.* demonstrated in Monastir Bay, the social acceptability of aquaculture depends less on the technical efficiency of projects than on the prior recognition of fishing communities and their integration into decision-making processes (Agúndez *et al.*, 2024). This shift in focus—from solely "how to produce" to "with whom and for whom to produce"—proves crucial for understanding the Bizerte Lagoon.

The concept of resource regime proposed by Ostrom allows for a simultaneous analysis of the resource (the lagoon ecosystem), the social system (user communities), and institutional rules (legal framework, local arrangements). However, as Sallemi showed regarding northern Tunisian fisheries, official management models "circulate" between the international scale, the State, and local territories, but struggle to materialize in the "gray zone" of actual practices, where informal arrangements between user groups unfold (Sallemi, 2025). This gray zone, composed of tacit negotiations, temporary tolerances, and open contentions, is the real ground where conflicts and, potentially, their resolution are played out.

2.2. Environmental conflicts and coastal usages

The second theoretical foundation lies in the analysis of usage conflicts in Mediterranean coastal environments. According to Cadoret, these "situations of tension and conflict within open coastal spaces" must be analyzed as expressions of differentiated attachments to the territory and its resources (Cadoret, 2013). Far from being reduced to simple material competition, these conflicts refer to systems of representation, professional identities, and asymmetric power relations, which Cadoret and Beuret have shown to have a structuring impact on marine protected areas (Cadoret & Beuret, 2022).

From this perspective, conflict is not only a blocking factor: on the contrary, Cadoret and Beuret

demonstrate that it can constitute "an opportunity for the territorial anchoring" of protection mechanisms, provided it is recognized, qualified, and mediated (Cadoret & Beuret, 2021). This reading framework allows us to understand the November 2019 episode of vandalism not as an isolated incident, but as the visible manifestation of a latent conflict, carrying both blockages and opportunities for territorial reconfiguration.

Finally, the research conducted in Spain by Martínez-Novo *et al.* on fisheries co-management confirms that conflicts between aquaculture and traditional fishing are documented in several Mediterranean contexts, but take specific forms according to local socio-economic configurations (Martínez-Novo *et al.*, 2016). This Mediterranean comparison sheds light on the uniqueness of the Bizerte case, where the coexistence of mussel farming (mytiliculture) and small-scale fishing occurs in a context of economic transition, marked by high unemployment and a strong dependence of coastal populations on fisheries resources (Yahyaoui, 2018).

3. METHODOLOGY AND FIELDWORK

3.1. Qualitative survey

The chosen methodological approach relies on a comprehensive qualitative process, based on semi-structured interviews conducted in Tunisian Arabic dialect with two categories of users of the Bizerte Lagoon: on one hand, shellfish farmers located in Menzel Abderrahmane, the main mussel farming hub of the lagoon; on the other hand, small-scale fishermen operating from the ports of Menzel Abderrahmane and its surroundings, notably Menzel Bourguiba and Menzel Jemil, who belong to a community long anchored in the area.

The interview guides, administered individually, were structured around six common thematic axes, allowing for a systematic comparison between the two groups: (i) professional trajectory and longevity in the activity; (ii) description of practices, gear, and exploitation areas; (iii) perceived evolution in fish quantities and sizes over the past five to ten years; (iv) perceived impact of shellfish installations on the seabed, water clarity, and fish movements; (v) external environmental pressures on the lagoon, notably industrial pollution; and (vi) future outlook and potential solutions.

The survey was completed by direct field observations along the shores of the lagoon and by analyzing institutional documents relevant to the Tunisian regulatory framework. This triangulation of sources makes it possible to gather the actors' perspectives and access the symbolic and identity dimensions of the conflicts, which are often obscured by strictly sectoral approaches (Martínez-Novo *et al.*,

2016). The analysis is based on a thematic coding of the verbatims transcribed from Arabic and translated, utilizing the interview guide categories while allowing the actors' own meanings to emerge.

3.2. Interviews with key actors

The fieldwork is based on 10 in-depth interviews conducted in June 2025 and June /July 2026 with key actors in the lagoon:

- **Interviews with 4 shellfish farmers from Menzel Abderrahmane:** who operate mussel-farming concessions using longlines (chapelets). Their testimonies focus on the material damage suffered (specifically that of 2019), grievances against fishermen, and the perceived quality of the lagoon environment.
- **Interviews with 6 small-scale fishermen:** operating from Menzel Abderrahmane and practicing fishing with gillnets and traditional towed gear. Their discourse questions the impact of shellfish farming structures on water clarity, fish movement, and fishery productivity. They also provide complementary perspectives on recent changes in catches, the perceived responsibility of various users (shellfish farmers, unauthorized divers, industrial units), and future outlooks.

These 10 interviews, extended by field observations, form the central empirical material of this article. The significant excerpts quoted in the text are translated from Tunisian Arabic dialect and presented in italics, accompanied by an attribution specifying the respondent's role, location of activity, and date of the interview.

4. The Bizerte lagoon

4.1. Environmental characteristics

The Bizerte Lagoon is a Mediterranean coastal depression with an area of approximately 150 km², connected to the sea by a narrow channel. It is characterized by shallow bathymetry, brackish waters, and high sensitivity to terrigenous runoff and anthropogenic pressures (Hamdaoui *et al.*, 2022). Its shallow water column, seagrass meadows, and muddy-sandy bottoms make it both a hotspot for fisheries productivity and an ecologically vulnerable system, subject to eutrophication, industrial pollution, and climate change (Hamdaoui *et al.*, 2022).

4.2. Activities and users

On the shores and within the water body of the lagoon, a mosaic of activities is deployed, whose coexistence is by no means negotiated through an integrated management plan. Yahyaoui identifies up to seven main categories of users competing for the lagoon space: coastal fishermen (trawlers, purse seiners/lamparos), shellfish farmers (mussels and oysters), cage-based aquaculturists, commercial shipping, military activities (with their restricted zones),

recreational fishing, and water sports (Yahyaoui, 2018). Shellfish farming, a relatively recent activity in the lagoon, developed primarily in Menzel Abderrahmane from the 1980s onward, whereas small-scale fishing is part of a tradition anchored locally for several generations. This temporal asymmetry—between an "historical" activity and a recently "installed" one—deeply structures mutual perceptions and constitutes one of the major explanatory factors of current conflicts (Sallemi, 2025).

5. Usage conflicts

5.1. A defining event: November 2019's uprising

The conflictual territorial presence of shellfish farmers and fishermen in Menzel Abderrahmane reached a critical threshold in November 2019. In the course of a single night, all the longline rearing installations (chapelets) located on the shellfish site were methodically destroyed: equipment was burned, and ropes were severed.

"There was the 2019 incident; the equipment was burned, and the lines of the cages were cut."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

The economic damage was considerable: approximately 35,000 Tunisian dinars (TND) per 300-meter longline, amounting to up to 500,000 TND for an average farm operating 27 longlines—a loss expressed by the respondent with a high emotional toll:

"That is what we lost. It is worth millions. Three hundred meters is worth millions. Imagine: if you have 27 longlines... that's about 500,000 dinars, everything else. Everything. Gone."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

The scale of the destruction—the complete burning of floats, systematic cutting of moorings, and the impossibility for owners to recover any structure—goes beyond standard interpersonal disputes, indicating a logic of collective economic deterrence. In the narratives of both groups, the event marks an irreversible rupture in neighborly relations: it establishes the moment when the latent antagonism between mussel farming and small-scale fishing ceased to be tolerable and became crystallized in local memory. Its inclusion in this analysis is crucial because this episode is simultaneously minimized by the fishermen, denied its proper legal classification by the State, and leveraged by the shellfish farmers as proof of their structural vulnerability.

5.2. Perceptions of shellfish farmers

The discourse of shellfish farmers highlights a bundle of convergent grievances directed at both the fishermen and the State. Beyond the 2019 destruction documented in Section 5.1, the first register concerns

more discrete but repeated daily damages, written in the margins of the questionnaire:

"Yes, there are: frequent thefts, verbal hostility, damage, entanglement of fishermen's nets with rearing tables, and severing of ropes."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

He describes the climate of hostility as a permanent pressure that destroys any hope of stable production:

"There is theft by the fishermen, and at night, the harvest is publicly ruined because we are far from them. And sometimes they set their nets very close, and when I go to tell them, it's them who are the masters and they run things."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

The shellfish farmer also describes a climate of administrative impunity during the 2019 episode, where coastguards present at the scene remained passive onlookers as ropes were cut, and the governor reportedly deterred those who wanted to defend their property:

"They cut the longlines. The governor came with the coastguards in a boat, they were standing there watching people cut, and my workers were watching. And anyone who wanted to go and claim their rights, the governor stopped them."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

"A fisherman comes as if to set a net, but you, the fisherman, according to the law, you do not have the right to come into the middle of my lease to set a net."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

These verbatims reveal a relationship with the State characterized by disappointed expectations, unexercised protection, and a sense of legal abandonment.

The second register concerns the quality of the environment. Contradicting the fishermen's accusations, the mussel farmer asserts:

"The lagoon is small, but mussels do not pollute the sea; we are not the ones who pollute."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

He shifts the responsibility of contamination to industrial discharges—sugar refinery, units in Menzel Bourguiba, Menzel Jemil, and Bizerte—as well as domestic wastewater. For the interviewed shellfish farmer, these external factors account for about 70% of pollution sources, whereas their own installations explain only 30%. Only a third of mussel mortality is

thus attributable to local conditions, while the remaining two-thirds stem from external factors. This causal displacement is crucial: it reflects an identity defense strategy by which the shellfish farmer establishes themselves as an innocent victim of a pollution they did not cause but whose economic consequences, they nevertheless suffer.

The third register focuses on state regulation. Shellfish farmers denounce the lack of control over informal aquaculture setups, which generates unfair competition:

"There is a strong demand for mussels, but there is no control because of the overabundance of black-market sales."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

"The problem is that the State does not know how to enforce controls. Those who sell at night sell more than those who sell in compliance with the rules."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

He specifically describes the situation of compliant operators, forced to remain "inactive" with their ten loaded trucks while smugglers sell their black-market products. Furthermore, he deplores the State's refusal to classify the 2019 event as a natural disaster eligible for compensation, despite ministerial visits:

"The State came, they went out to sea with us, they showed us the dead stock on the basis that there would be natural disaster compensations. Then the State told you it's not a natural disaster."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

"No compensation because according to them it's not a natural disaster. Stagnant [hostage] mentality: absence of the State and controls, and it's not right, nothing is left."

— Shellfish farmer, Menzel Abderrahmane, interview June/July 2026

The lack of regulation is thus experienced as a triple denial: denial of recognition of losses, denial of physical protection of installations, and denial of competitive equity against informal operators.

5.3. Perceptions of fishermen

The fishermen's discourse articulates specific grievances against shellfish farming while revealing a global representation of fishery decline that extends beyond the installations themselves. A first, socio-ecological and technical grievance asserts that mussels consume a significant portion of dissolved oxygen:

"The problem is the mussels: they consume the oxygen, and the fish flee."

— Fisherman, Menzel Abderrahmane, interview June 2025

Fishermen describe a depletion of catches—with nets hauled up nearly empty—as well as a shift in species composition, now dominated by lower-value species (abundant mullet, with red mullet, sea bream, sea bass, and cuttlefish becoming rare). The introduction of specialized feed for mussels is also perceived as diverting resources away from wild fish:

"It only benefits the fish that eat this special feed."

— Fisherman, Menzel Abderrahmane, interview June/July 2026

A second register, spatial and safety-related, concerns the physical overcrowding of the water body: "The ropes and buoys create permanent obstacles that hinder our movements and damage our nets during night maneuvers," several small-scale fishers lament, emphasizing that this restriction of navigable space is akin to a deprivation of their usage rights over a territory they consider historically acquired (Salleme, 2018). This perception of territorial dispossession is exacerbated by the belief that shellfish structures act as artificial barriers, forcing fishermen to restrict their areas of activity and modify their usual techniques (Poignonec, 2006). This spatial constraint is coupled with a denunciation of privileges granted to actors perceived as intruders, fueling the feeling that the lagoon space is being monopolized to the detriment of the collective rights of small-scale fishermen (Annaig, 2017).

"It has greatly affected the quantity of fish, because it reduces oxygen and increases pollution, and nothing has been left behind them but mullet in smaller quantities."

— Fisherman, Menzel Abderrahmane, interview June/July 2026

Fishermen claim that farming structures generate silt accumulation and hinder the circulation of water and fish, transforming certain zones into spaces unfit for productive fishing: "The ropes and submerged structures act as physical obstacles that tear our nets, a nuisance that adds to the ongoing degradation of fish feeding grounds," another professional emphasizes. This spatial obstruction is worsened by the perception that shellfish reefs and structures displace fish schools to areas out of reach of their artisanal gear, intensifying the sense of territorial dispossession before an activity perceived as intrusive (Dahou *et al.*, 2023). Added to this is the fear that these installations, by capturing nutrients, promote direct biological competition that harms the reproduction of local species, thus reinforcing the fishermen's feeling of being the collateral victims of irreversible environmental change (Derolez, 2020; Kim, 2014).

They also point to a restriction of their traditional anchoring zones, which are now zoned for mussel-farming leases, and protest against the systematic granting of licenses to all categories of users, including pleasure boats, without any compensation for small-scale fishermen:

"There is no equity compared to pleasure boats on the shores, but for the lease operators, each category has its permit and papers."

— Fisherman, Menzel Abderrahmane, interview June/July 2026

A third register questions the lack of regulation of other activities that they perceive as more destructive than shellfish farming. Fishermen attribute a large share of the responsibility to illegal towed gear ("PMS") as well as unregulated diving-based fishing (el ghattassa), which they blame for 70% to 80% of the observed fishery decline:

"They are already the cause of 70% to 80% of the decrease in fish. That's the group of divers."

— Fisherman, Menzel Abderrahmane, interview June/July 2026

"Fishing with diving gear? Exactly. Just like that. They have no permits, nothing at all."

— Fisherman, Menzel Abderrahmane, interview June 2025

"For us, as a locality, what worries us is something else. What worries us are the divers. You understand? Because the divers do not let the fish reproduce; they do not leave the fish that we eat..."

— Fisherman, Menzel Abderrahmane, interview June 2025

Fisherman "B.B." builds a two-step argument: he isolates the divers (regarded as the primary source of degradation) from the rest of the sector, while also mentioning industrial pollution coming from outside the lagoon:

"High proportion, 100% of the pollution comes from the factories."

— Referring to sugar refineries, units in Menzel Bourguiba, Menzel Jemil, and Bizerte — Fisherman, Menzel Abderrahmane, interview June 2025

By positioning themselves as vulnerable actors in a dying system, fishermen construct an argument that partially, though in their eyes insufficiently, dissociates them from the grievances directed at all other usages.

5.4. Identified tensions

The confrontation of the two corpora reveals three major types of tensions that cannot be reduced to a binary confrontation between two homogeneous groups.

First, the causal dispute regarding the origin of pollution: structures the entirety of the discourses. Shellfish farmers and fishermen agree on a common diagnosis of massive pollution but diverge radically on the assignment of responsibility. In the eyes of the fishermen, shellfish farming is responsible for a significant share of the lagoon's depletion, as mussels "consume oxygen" and "pollute the lagoon." In the eyes of the shellfish farmers, aquaculture is merely a convenient scapegoat for a crisis whose true culprits are industrial, domestic, and "informal" polluters. This dispute reveals that pollution functions as a political operator through which each group seeks to exonerate its own practice while disqualifying that of the other (Cadoret, 2013). The contrast is even quantifiable: the shellfish farmer attributes 70% of the pollution to external sources, while the fishermen attribute 70% to 80% of fishery decline to illegal diving and 100% of pollution to industrial discharges. These contradictory estimates, expressed with the same confidence by both camps, reveal the impossibility of a shared diagnosis as long as conflict remains the dominant mode of relationship between the groups (Cadoret, 2013).

Second, the inequality of institutional recognition: constitutes a powerful factor of shared bitterness. The fishermen denounce a heavy tax burden on the small-scale fisher without any tangible returns:

"And there is no return, no action from the authorities. And the taxes are heavy on the small fisherman."

— Fisherman, Menzel Abderrahmane, interview June 2025

"It is an unorganized sector, and it doesn't even have a link with the public authority."

— Regarding the absence of effective trade union representation — Fisherman, Menzel Abderrahmane, interview June 2025

Shellfish farmers, for their part, experience a denial of compensation and a lack of physical protection for their installations, especially after 2019. Both groups thus express a common feeling of being "voiceless" before a State that recognizes neither their losses nor their efforts, an observation that aligns with Sallemi's analysis of the Tunisian "gray zone," a space of model circulation where informal arrangements deploy their effects without true institutional support (Sallemi, 2025).

Third, the clash of incompatible temporalities:

appears prominently in the discourses. The fishermen view themselves as the guardians of a traditional relationship with the lagoon, inherited and transmitted, and redefine their profession as an act of presence that explicitly excludes the use of certain modern, destructive techniques:

"I do not practice this method; I do not agree with it."

— Concerning fishing methods deemed destructive — Fisherman, Menzel Abderrahmane, interview June 2025

The shellfish farmers operate within a long-term investment temporality (heavy financial commitments, projection over multiple production cycles) and feel entitled to expect from the State and other users a minimal stability of their operating conditions. This temporal asymmetry—between an unwritten, long-term tradition and a recent formal contract—generates conflicting expectations that are impossible to satisfy within the current institutional framework.

6. DISCUSSION OF RESULTS

6.1. Conflict dynamics

The analysis makes it possible to qualify the nature of the conflict dynamics observed in the Bizerte Lagoon. Unlike a strictly distributive conflict (sharing a limited resource), the observed conflict represents a conflict of recognition as defined by Cadoret and Beuret: it concerns both the legitimate definition of lagoon usages and the actual distribution of space and resources (Cadoret & Beuret, 2021). The fishermen claim the primacy of a "traditional" and small-scale relationship with the sea, which they argue is prior and superior to farming installations—a relationship claimed as more legitimate in the name of historical rooting and manual fishing. The shellfish farmers claim the legitimacy of a formally authorized activity that generates employment and is recognized as technically compliant with current standards. This competition extends into a power asymmetry, with aquaculture benefiting from a stronger institutional and financial foundation than small-scale fishing, corroborating the observation of Pérez Agúndez *et al.* regarding the weight of aquaculture enterprises in defining local priorities (Agúndez *et al.*, 2024).

The sequence of November 2019 illustrates with particular clarity the process of "crystallization" of a latent conflict. The scene described by the shellfish farmer—a governor spectating the severing of lines, coastguards "standing there watching" without intervening, and the aggressors protected by the authority that had nevertheless come to record the facts—shows that the denial of legal qualification ("it is not a natural disaster") and the absence of physical intervention constitute one and the same political gesture: the withdrawal of the State in favor of a private management of the conflict.

According to Cadoret and Beuret, such moments of rupture, however costly they may be at the time, can paradoxically open a window of opportunity for a reconfiguration of governance frameworks, provided that public authorities agree to treat the event as a symptom rather than an isolated incident (Cadoret & Beuret, 2022). Yet, in this case, the State instead opted for a denied legal qualification that strips the event of any

political dimension and shifts all responsibility to the private sphere.

6.2. Toward shared governance

In the perspective of shared governance, three lines of action seem to emerge from the empirical materials and literature.

A first line of action involves spatial and regulatory clarification:

Currently, the lagoon does not have an integrated management plan shared among actors. The development of a marine spatial planning framework would constitute a relevant institutional lever in this regard, in line with the recommendations of Hamdaoui *et al.* (Hamdaoui *et al.*, 2022).

A second line of action focuses on building a common representation of environmental quality:

As long as actors oppose each other on the causal attribution of pollution, it will be impossible to construct collective remediation efforts. In this regard, participatory experiences conducted in other Tunisian bays, such as Monastir Bay, show that collaborative environmental co-diagnosis involving scientists, shellfish farmers, and fishermen can help objectify a shared diagnosis and defuse emotional debates (Agúndez *et al.*, 2024). Such a mechanism would notably make it possible to scientifically arbitrate the discrepancies between the actors' estimates (as each group tends to minimize its own share of responsibility) and base regulation on shared data. The co-diagnosis process would also have the virtue of bringing forth a common representation of the lagoon environment as a shared common good, and not a juxtaposition of competing uses (Rey-Valette *et al.*, 2008).

A third line of action concerns the institutional recognition of both groups:

Both fishermen and shellfish farmers express a shared feeling of a lack of listening:

"There is no means of transmitting our voices or getting action from the authorities."

— Fisherman, Menzel Abderrahmane, interview June 2025

Cadoret recalls that in open Mediterranean spaces, the absence of institutional mediation mechanisms transforms tensions into violent ruptures (Cadoret, 2013). The establishment of permanent concertation platforms—user committees, environmental mediation, or a lagoon observatory—would allow for the transformation of latent conflicts into structured dialogue, which represents the only path

toward effective socio-ecological sustainability (Cadoret & Beuret, 2021; Sallemi, 2025).

7. CONCLUSION AND OUTLOOK

This survey, conducted in the Bizerte Lagoon with shellfish farmers from Menzel Abderrahmane and small-scale fishermen operating in the gulf, uncovers a conflictuality that goes far beyond a simple material competition for lagoon space. It stems from a competition between legitimacies, temporalities, and systems of representation, where each group strives to shift the responsibility for fishery decline onto the other while jointly denouncing a State identified as weak, distant, and failing in its regulatory mission. The November 2019 episode of vandalism marks a critical threshold in this conflictual trajectory, and its non-recognition by the authorities has deprived it of any instituting scope.

Three main lessons can be drawn from this research. First, the observed conflictuality cannot be reduced to a simple face-to-face confrontation between two groups; it also involves a third actor—the State—whose lack of normative framing and low arbitration capacity act as aggravating factors (Cadoret & Beuret, 2022). Second, the conflict functions here as a powerful revealer: it makes visible the power relations, the inequalities in access to public speech, and the temporal asymmetries between usages, confirming the relevance of the analytical framework developed by Cadoret (Cadoret, 2013). Third, and perhaps most crucially, conflict can also be conceived as an opportunity if one agrees—following Cadoret and Beuret (Cadoret & Beuret, 2021) and the participatory work conducted in Monastir (Agúndez *et al.*, 2024)—to use it as a lever for the reconfiguration of governance mechanisms.

The limitations of this study lie in the restricted size of the interview corpus, the predominance of male perspectives, and the absence of female interviewers among the shellfish farmers. Further research would allow for expanding the sample to other shellfish sites in the lagoon, cage-based aquaculturists, and decentralized state services, to better grasp the internal diversity of each category and outline the practical conditions for an operational mediation mechanism. Indeed, the sustainable management of fisheries requires anticipating these structural tensions through concertation mechanisms that transform territorial rivalries into opportunities for the territorial anchoring of conservation policies (Cadoret & Beuret, 2021; Léopold, 2018). In this regard, the formal recognition of territorialities and the effective inclusion of all stakeholders in decision-making bodies appear as essential levers to regulate power asymmetries (Cadoret & Beuret, 2022).

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