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EDITED BY
Lyne Morissette,
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Simon Fraser University, Canada

*CORRESPONDENCE
José Bakit
jbakit@ucn.cl

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Navigating transformations from artisanal fishers to entrepreneurial scallop farmers in Chile

José Bakit[1,2,3]*, Andrés Hurtado[4], Raúl Márquez[5] and Sebastian Villasante[2]

[1]Departamento de Acuicultura, Facultad de Ciencias del Mar, Universidad Católica de Norte, Coquimbo, Chile, [2]EqualSea Lab - Cross-Research in Environmental Technologies (CRETUS), Departamento de Economía Aplicada, Universidad de Santiago de Compostela, A Coruña, Spain, [3]Campus Do Mar, International Campus of Excellence, Santiago de Compostela, Spain, [4]Instituto de Políticas Públicas, Universidad Católica del Norte, Coquimbo, Chile, [5]Departamento de Antropología Social, Universitat de Barcelona, Barcelona, Spain

The expansion of neoliberalization of fisheries in developing countries has been largely driven by political economic decisions. Artisanal fisheries and aquaculture have not been exempt from these privatization measures, the implementation of deregulation measures in the fisheries sector, and commoditization strategies oriented mainly to exports. However, little research has been done about these issues jointly in South America. Therefore, the adoption of these measures and the adaptation and transformation of artisanal fishermen to entrepreneurs were studied in the scallop (*Argopecten purpuratus*) fishery/aquaculture in Tongoy Bay, Chile. We use qualitative research and an analysis of historical archives to describe a series of political-economic changes, stages, and processes involved in the transformation of the sector. The analysis focuses on conflicts, resistance practices, and value regimes between fishers and farmers to explore the different moral economies at play. Our results show that (a) changes in moral economies are neither automatic nor unidirectional; (b) the State, through its economic policy, technological development institutions, and technology transfer actions, does not directly generate expected results; (c) artisanal fishers who have become entrepreneurs understand and justify competitiveness (or lack of it) because some are more entrepreneurial than others; (d) despite the adoption of neoliberal guidelines, aspects of a more traditional moral economy remain, such as the role of family units in the configuration of enterprises; and, finally, (e) artisanal fishers have moved from a traditional moral economy based on collective and historical rights to a neoliberal moral economy based on the individual and his or her capacity for self-improvement, entrepreneurship, and efficient work management.

KEYWORDS

political economy, moral economy, neoliberalism, Scallop, small-scale fisheries, small-scale aquaculture, transformative changes, Chile

1 Introduction

The expansion of the neoliberal economy in Chile has been characterized by the search for economic growth through the exploitation of raw materials traded in global markets, from saltpeter (sodium nitrate) in the late 19th century, to forest timber, various metal ores (e.g., copper and lithium), and marine resources such as shellfish and seaweed (Norambuena and González, 2005; Muñoz, 2009; Bustos-Gallardo and Prieto, 2019; Márquez and Vásquez, 2020). Under this context, aquaculture has been one of the economic activities that has seen the greatest development since the 1990s (Uriarte, 2008; Molina et al., 2012). Favorable open market policies allowed Chile to become one of the world's leading mollusk exporters (CORFO, 2016), with the scallop (*Argopecten purpuratus*) representing the country's principal aquaculture exports. In the mid-1990s, Chile became the third largest producer of *A. purpuratus* in the world, only after China and Japan (Uriarte, 2008; von Brand et al., 2016; Kluger et al., 2019). However, this growth has not been free of what Soluri (2011) calls 'commodity diseases', characterized by periods of boom and crisis associated with events of biological, social, and/or politico-economic origins. These events have occurred both locally and globally in scope. The commodity diseases concept also "[…] serves as a reminder that the blue revolution that has washed over Chile has been directed by government policies and business strategies that see food production as a means of enabling accumulation—by corporate shareholders, small businesses, local governments, and wage earners" (Soluri, 2011).

This paper analyzed the transformations experienced by the *A. purpuratus* fisheries driven by Politic-economic and technological changes undergone during the last decades. The analysis of the transformation of the scallop industry is relevant because fish and shellfish are important sources of animal protein, employ large numbers of people, and generate high export earnings in developing countries (Campling et al., 2012). Studying the economic-political changes in the aquaculture sector is also important since it throws light on the processes by which Chilean coastal fishers have historically interpreted and given meaning to coastal practices and resources. This enables us to see how, in many cases, the values and interests of fishers became in conflict with the social and ecological transformations of the coast (Tecklin, 2015).

This paper uses the concept of "moral economy" known as "as a heuristic lens with which to examine legitimacy crises and socio-economic change" (Friberg and Götz, 2015), to understand the dynamics of conflict and adaptation that may have generated these transformations in *A. purpuratus* aquaculture. This concept studies the moral norms and behaviors that structure and influence economic practices, both formal and informal, and how these are reinforced, compromised, or overridden by economic-political pressures (Thompson, 1971; Scott, 1976; Arnold, 2001; Sayer, 2007). Using the moral economy framework, we analyze the progressive adoption of new practices and values away from the moral economy that traditionally drove artisanal fishing around the scallop boom in Tongoy Bay.

Different events contributed significantly to the boom of *A. purpuratus* as a commodity in Chile, in general, and in Tongoy Bay, in particular, in particular (Stotz, 2000; Kluger et al., 2019; Bakit et al., 2022). These events included a favorable climate event, namely the warm ENSO (El Niño - Southern Oscillation) current phase that occurred in the mid-1980s, which favored scallop recruitment, survival, and growth (Illanes et al., 1985; Wolff, 1987). Export-centered economic growth policies (Ffrench-Davis, 2002) and neoliberal measures to implement private property rights and economic efficiency (Terrebonne, 1995; Pinkerton and Davis, 2015) played an important role. As a result of the associated politic-economic transformations promoted by the State and the private sector, this boom, nonetheless, generated social problems and conflicts at the community level (Bustos-Gallardo and Prieto, 2019).

A look at the history of scallop extraction in Tongoy Bay indicates that the earlier records date back to the mid-1940s, when the resource – known locally as the 'Northern ostión' – was exploited from natural beds (Uriarte, 2008). Traditional collection methods were used by artisanal fishers[1] and shellfish divers, who hand-picked scallop directly from the seabed (von Brand et al., 2016; Kluger et al., 2019). In the mid-1980s, extractive activity contributed to the overexploitation of the resource (Soto and Villalobos, 2002), which leads Chilean authorities to impose temporary extraction bans on natural beds. These bans still remain in force, meaning that the only permitted capture is for seeding purposes (Subpesca, 2012), because the natural stocks have not been able to recover due to the continuous harvesting of adult scallops. The development of aquaculture production of the species became the only viable alternative if exports were to continue after the mid-1980s (Bakit et al., 2022). Experimental farming based on Japanese cultivation systems began in 1985 (Uriarte, 2008; Bakit et al., 2019), and culminated in the implementation of technology adapted to the conditions of Tongoy Bay, subsequently distributed to the local productive sector for commercial purposes (Uriarte et al., 2001; Bakit et al., 2019). The first scallop-farming companies began to develop on an industrial scale (Uribe et al., 2008; Uribe et al., 2018). This historical trajectory and the evolution of economic policy made it possible to analyze the transformation process experienced in Tongoy Bay in depth, given the historical existence of natural scallop beds and the large contribution of the bay to national scallop production (Figure 1).

The early adoption of technology was not without important challenges and irregularities. Many of the scallops that were in theory cultivated actually came from natural beds: they were simply deposited by divers in growing bags as a way of circumventing the ban on extraction (Kluger et al., 2019). The justification for this practice was that these specimens were needed as "seeds" for the development of scallop cultivation (von Brand et al., 2016). However, this practice resulted in the depletion of natural beds in large areas of northern Chile (Stotz and González, 1997; Stotz, 2000). As a result, *A. purpuratus* went from being a species with

1 This article uses the term 'fishers' inclusively, in keeping with prevailing practice in sources and style guides consulted. Associated personal pronouns are rendered in a gender-inclusive style, except where interviewees are directly cited.

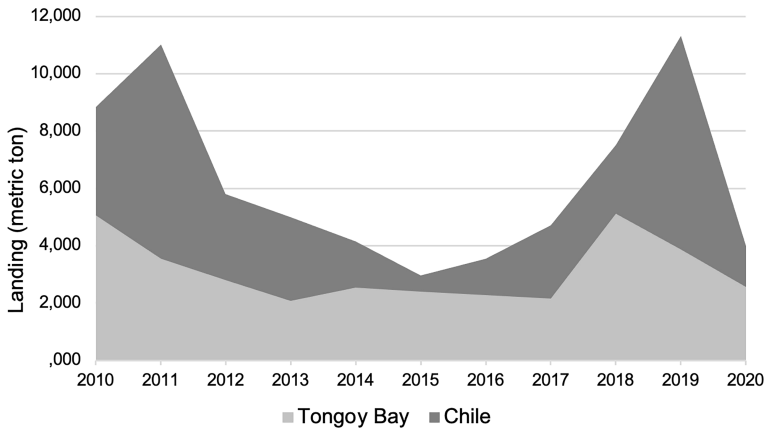

FIGURE 1
Contribution of Tongoy Bay to Chile's Scallop Production (elaboration based on Tongoy Provincial Department SERNAPESCA data).

natural populations to one produced exclusively through aquaculture in suspended systems (Stotz, 2000; Kluger et al., 2019). Once the technology that had been introduced was transferred to the aquaculture productive sector, industrial farming proliferated in the bay, while in parallel extraction from natural banks declined.

Many artisanal fishers became waged employees in farming companies, learning in practice from the Japanese technology (Bakit et al., 2019). They later looked for the opportunity to cultivate in their own right, recycling materials discarded by industrial farms. Faced with the proliferation of industrial farms, the Association of Artisanal Fishermen of Tongoy (*Asociación Gremial de Tongoy*, AG Tongoy) was created in 1998 to promote regaining access to resources that had previously belonged to its members through historical rights. They argued that the new practices hindered freedom of movement and the continuation of traditional working practices in the Tongoy Bay, a problem exacerbated by the 'parceling out' of the sea via the granting of exclusive user rights (Figure 2). To resolve this conflict, the State transferred exclusive user rights to AG Tongoy (von Brand et al., 2016) with the aim of transforming fishers into farmers integrated into national and international seafood markets. A public-private alliance encouraged fishers to form companies governed by fishers-shareholders (Uribe et al., 2018). Due to the boom of *A. purpuratus* at the beginning of the 1990s (Stotz, 2000), these companies were initially highly successful, exporting large volumes during the 2000s, mainly to European markets (Bakit et al., 2022). However, the subsequent entry of the Peruvian scallop into the international market, at a lower cost, led to the bankruptcy and closure of most of the Chilean fishing companies, profoundly affecting the economic life of Tongoy (Molina et al., 2012; Bakit et al., 2022).

Our paper represents an advance in relation to the current State of the art by (i) applying the concept of moral economy, commonly used in previous studies concerning access to other types of food systems (Thompson, 1971; Scott, 1976; Orlove, 1997; Carrier, 2017); (ii) analyzing the modernization of small-scale scallop fisheries, altered by new regulations that generated changes in the forms of organization of social-ecological systems (SES), the formalization of their activity and the commodification of the species; and (iii) expanding the vision of the oceans as a driver of economic and social well-being (Rudd, 2014), as well as the diversity of motivations and perspectives of fishers in their adaptive pathways (Andrews et al., 2021). The key events of the transformation experienced by the sector are described, paying special attention to conflicts, practices of resistance, and value regimes among and between fishers and farmers. Ultimately, the aim is to analyze the different moral economies that prevail within and across the two groups (Palomera and Vetta, 2016).

2 Methods

We use a qualitative case study approach in Tongoy Bay due to its high contribution to scallop production in Chile. During the last decade, the area contributed between 35% and 80% to the total scallop production in the country (Figure 1). The fieldwork was carried out in three stages. The first and second phases consisted of in-depth qualitative interviews between August and October 2017, and between October 2018 and January 2019. These phases focused mainly on the creation and validation of information, following the saturation principle for qualitative research (Guest et al., 2020). The third phase, between May and August 2021, included the review of archives, photographic records, laws, decrees, and other public documents from 1980 to 2020.

2.1 Semi-structured interviews and the principle of saturation

The study followed a non-probabilistic qualitative sample, seeking to represent a network of relationships between research subjects, validated by the principle of saturation, understood as the exhaustion of new information to data that does not add variation to what is already known (Canales Cerón, 2014; Guest et al., 2020). This sampling strategy was chosen because qualitative research

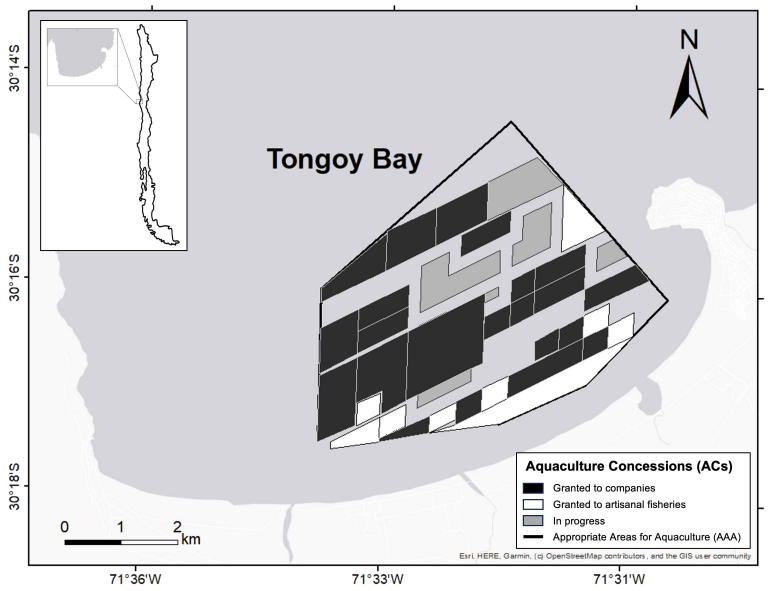

FIGURE 2
Area of study and spatial distribution of aquaculture concessions in Tongoy Bay 2020. (Subpesca; Retrieved on June 14, 2020).

studies people with specific knowledge in specific contexts and situations (Rapley, 2014). In-depth qualitative interviews were conducted face-to-face (for approximately 60-90 minutes) with actors who experienced the boom of the cultivation in the past, as well as with actors working in the industry today. Based on the classification of Badjeck et al. (Badjeck et al., 2009) made to identify key actors to conduct interview programs, the interviews included fishers, farmers, business advisors, and officials from public institutions. Key actors were defined by considering the quality of the information they have about the transformation process, thus significantly reducing the number of interviewees (Malterud et al., 2015). The number of new concepts and/or findings associated with each additional interview generally tended to decrease between 15 and 30 interviews (Morgan et al., 2002). The principle of data saturation for qualitative research (Canales Cerón, 2014; Guest et al., 2020) facilitated the adjustment of the appropriate number of interviewees during the course of the research, allowing sampling to be terminated when the point was reached, where new incoming data did not generate new information useful for the study (Guest et al., 2020). In-depth face-to-face interviews with narrative-based methods and appropriate probes are well suited to exploring subjective and experiential topics, arguably helping people reflect on their values more deeply than paper or web-based surveys (Garcia Rodrigues et al., 2022). Qualitative studies with non-proportional sampling by quotas have been conducted to unravel the diversity of views in relation to artisanal fisheries and aquaculture (Villasante et al., 2016; Ruiz-Frau et al., 2019). The number of interviewees reached 17 former and current actors, who - in line with what was postulated by Malterud et al. (Malterud et al., 2015) - were selected because their life trajectories are closely linked to the process of modernization and entrepreneurialization of artisanal fisheries in Tongoy Bay. The interviewees were fishers (6), fisher's association leaders (4), farmers (2), business advisors (2), and government officials (3). For data processing, the interview transcripts and notes were coded and analyzed using the qualitative data analysis software ATLAS.ti. The collected information was coded into criteria to explore and interpret (i) economic changes, (ii) social conflicts, (iii) moral economies, and (iv) political economy. Emergent information (e.g., extraneous, or contradictory data) was considered. Once the information was saturated and the elements necessary to construct a comprehensive and convincing theory on the topic were in place, the narrative that best interpreted the qualitative findings was chosen from among the narratives.

2.2 Archive work

On-site visits were made to public agencies and farmers in Tongoy Bay to review archives and documents from 1980 to 2020 that are not digitized. Production records and annual reports made it possible to establish the bay's contribution to national production. Photographic records allowed us to compare technological and social changes. To analyze the legal regulations associated with scallop extraction and aquaculture, the series of official laws from the Library of the National Congress of Chile was used. The sectoral regulations for fisheries and aquaculture were differentiated from those specific to the production of scallops. Figure 3 shows a timeline with the key events identified overtime related to the *A. purpuratus* production in Chile.

2.3 Spatial data

Aquaculture concessions granted for scallop farming were mapped. The temporal differentiation of aquaculture concessions

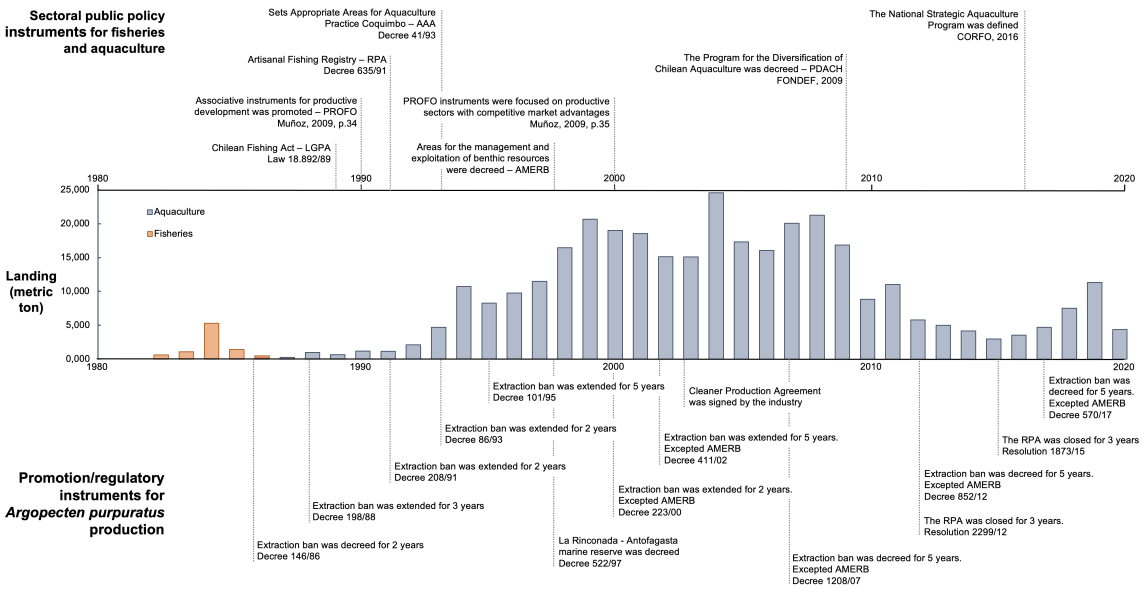

FIGURE 3
Key political economy events related to *A. purpuratus* production in Chile.

granted has been established for decades. This mapping allowed to appreciate the progress of the occupation of the sea by aquaculture concessions and their transition between owners (e.g., large scallop aquacultures and artisanal fishers). The spatial images, identification of cultivation centers, geolocation coordinates, and year of granting of aquaculture concessions were obtained from SUBPESCA's map viewer (https://mapas.subpesca.cl/ideviewer/). Spatial mapping has been made with Software ArcGIS, ArcMap 10.2.2 for Desktop, ESRI.

3 Results and discussion

The following section discusses two perspectives that allow us to interpret the results. First, we present the moral economies at stake, which account for the valuations surrounding the division of the sea and the social conflicts that emerge from the process, paying attention to the resistance practices of artisanal fishers to maintain their access to the sea. At this point, the measures for the regionalization of artisanal fishing versus historical and/or traditional regulations, the practices of resistance such as scallop trafficking and clandestine sales, and unionization to pressure the State to find a solution for access to the sea for fishers are relevant.

Second, some economic-political elements that operate as objective counterparts to moral economies are presented, in particular, the role of private property and wage labor for work at sea, and the implementation of entrepreneurship policies in artisanal fisheries. Relevant to this section are technology transfers and restrictions on the commercialization of scallops, the granting of aquaculture concessions to fishers, and the division of fishers between concession shareholders and their salaried self-employment.

3.1 Moral economies: sea parceling, social conflict, and practices of resistance in artisanal fishing

3.1.1 Access to the sea: parceling and regionalization of artisanal fisheries versus traditional and historical forms of regulation

Until the end of the 1980s, artisanal fishers had ample freedom of movement along Chile's coastal territory. They only needed a permit or registration, available from the Chilean Navy (*Armada*) in order to legally access the sea. Their income depended on the availability of natural banks of temporarily booming extractive species (i.e., the abundance of natural stocks and subsequent overexploitation of these stocks). Among the species that had temporary extractive booms were *C. concholepas*, *A. purpuratus*, and *L. albus*. In the case of Tongoy, fishers or divers relied on hookahs or air compressors to allow them to enter the sea, extracting scallops at a maximum depth of 20-30 meters (Kluger et al., 2019). The proceeds were sold quickly in small markets in the town or nearby cities. This practice was, however, hindered by the proliferation of industrial farms in Tongoy Bay. As already explained by Aguilar-Ibarra et al. (Aguilar-Ibarra et al., 2000), Chile underwent significant fisheries development from the 1970s onwards, including privatization and the implementation of deregulatory measures for the fisheries sector. These measures favored large fishing companies, leading to an industrial expansion of the fisheries and aquaculture sectors, which in turn led to the overexploitation of resources and to the emergence of conflicts with artisanal fishers for access to extraction areas that the latter conceived of as historically theirs (Figure 2). This affected the social relations of production, exchange, and local care (Sayer, 2007). Two moral economies came into conflict over the issue of

access to the sea. One of them was the longstanding creation of artisanal fishers which attempted to preserve forms of traditional and historical regulation of access to resources, among the principles of which was the right of fishers in the community to extract a certain minimum amount that would allow their families to subsist. The other moral economy emerged as new companies tried to establish rules of private property in the sea, seeking to guarantee the industrial exploitation of resources destined for export while considering it legitimate to extract the maximum possible amount of resources. Meanwhile, the Chilean State was called on to serve as an arbiter of emerging conflicts on the coastal edge, with some skepticism from fishers (Gayan and Dattwyler, 2017). Some of these conflicts were due to looting (e.g., theft of materials and scallops) from private companies by artisanal fishers, actions that can be considered acts of daily resistance to the changes by the latter (Scott, 1985).

The establishment of new rules affecting historical fishing rights may have undesirable consequences, alongside the expected or intended purpose of optimizing the use of resources (Aburto et al., 2013). In 1989, a new Chilean Fishing Act was passed (*Ley General de Pesca y Acuicultura*, LGPA). The legislation complemented the previous introduction of "*concesiones acuícolas*" (aquaculture concessions, ACs) (Figure 3). These concessions, while similar to the Territorial User Rights for Fisheries (TURFs) (Gelcich et al., 2017) differed in also allowing the use of the whole water column. Both the Act and the ACs sought to guarantee exclusive access for the harvesting of resources, protecting overexploited fisheries through the establishment of private property at sea. These changes were further supported by the implementation of the Artisanal Fishing Registry (RPA, after its Spanish acronym) and Appropriate Areas for Aquaculture (AAA) (Figure 3). As applied in Tongoy (González et al., 2016), the new regime produced social conflicts, by prohibiting new fishers from working on a fully exploited fishery product such as scallops. Such products could henceforth only be worked by those already registered (Aguilar-Ibarra et al., 2000). Fishers were rendered unable to access the RPA because certain areas of fishery products were closed to them and therefore entered the labor market. This provided an opportunity for the industrial companies to employ the poorest fishers. In this way, artisanal pressure on the overexploited resource was reduced (Cinner et al., 2008). The new legislation also promoted the regionalization of artisanal fishing, by limiting open access to the national coastal territory.

This territorializing measure sought to manage coastal space and resources through better fiscal administration and social control (Scott, 1998; Tecklin, 2015), despite informal agreements between local fishers and those who mobilized from other areas to exploit these interesting natural banks. As indicated by a SERNAPESCA official, referring to the problems that arose in the early 1990s due the limitation of freedom of movement:

"A fisherman only needed a license from the Navy: that was enough for him to set himself up as an artisanal fisherman or diver. They would move to one natural bank and work it for six, eight, or ten months, until they had fished it out; then another interesting natural bank would appear further south and they would all move there. It made it very difficult to manage fishing according to the carrying capacity of the resource banks".

- National Fishery Service Officer 1.

Noting the difficulties that the RPA generated for mobility along the coastal territory in historical areas, fishers began to worry. The new register required listing of resources – which were not to be overexploited - and naming of the region[2] where the fishers would be allowed to work those resources. Under this system, each artisanal fisher would only be recognized as such in the region in which he or she registered[3]. One artisanal fisher who lived through the process recounts how he found out about the regionalization promoted by the RPA:

"I worked as a shellfish diver. I moved from *caleta* to *caleta*, everywhere, like everyone here in Tongoy. One day we started to get scared because we heard that they were going to regionalize the people who work at sea. That a guy who worked in the Region of Coquimbo was not going to be able to go to other regions, he was only going to be able to move around inside his region".

- Artisanal Fisherman and Scallop Farmer 1.

The willingness and ability to adapt in response to changes in fisheries are influenced by economic, cultural, and institutional factors (Cinner et al., 2008). Artisanal fishers who engage in subsistence activities with lower catch value are more willing to adapt to changes in the sector (Daw et al., 2012). In the Chilean case, in order to encourage fishers to stay in the region where their RPA was located, the State promoted a reconversion process to avoid recurrent mobility along the coastal territory in the denominated 'historical fishing zones'. As opposed to other experiences of reconversion in the scallop fishery that allowed fishers to relocate in order to continue with the extraction/culture of the same species (López de la Lama et al., 2018). While many fishers decided to stay in Tongoy, others preferred to register further to the north or south of the country. Those who chose to stay had to deal with new problems: the continued proliferation of industrial fisheries (Aguilar-Ibarra et al., 2000), and the division of the sea into ACs, as can be seen in Figure 4.

ACs, granted by the State, allow persons or legal entities to access land on state-owned beaches, portions of water, and areas of the seabed. In line with Tecklin (Tecklin, 2015), this state of affairs seems to be framed in neoliberal territorialization processes: the State makes the territory manageable and controllable by delegating to private actors, who use their own capital, organization, and technology to control the space. The fishers felt that the industrial farmers were 'taking over' the sector since they prevented the free transit of artisanal boats by invoking territorial user rights. They were thereby deprived of beaches (Gayan and Dattwyler, 2017) as a result of extraction as practiced by the companies (Figure 4). The

2 'Region', here, refers to one of the 16 Chilean administrative territorial divisions into which the whole country is subdivided for governance purposes.

3 Chilean artisanal fishers are grouped into communities, located on the coast, known as '*caletas*' (Aburto et al., 2013). Each belongs to a particular province, and then to a region.

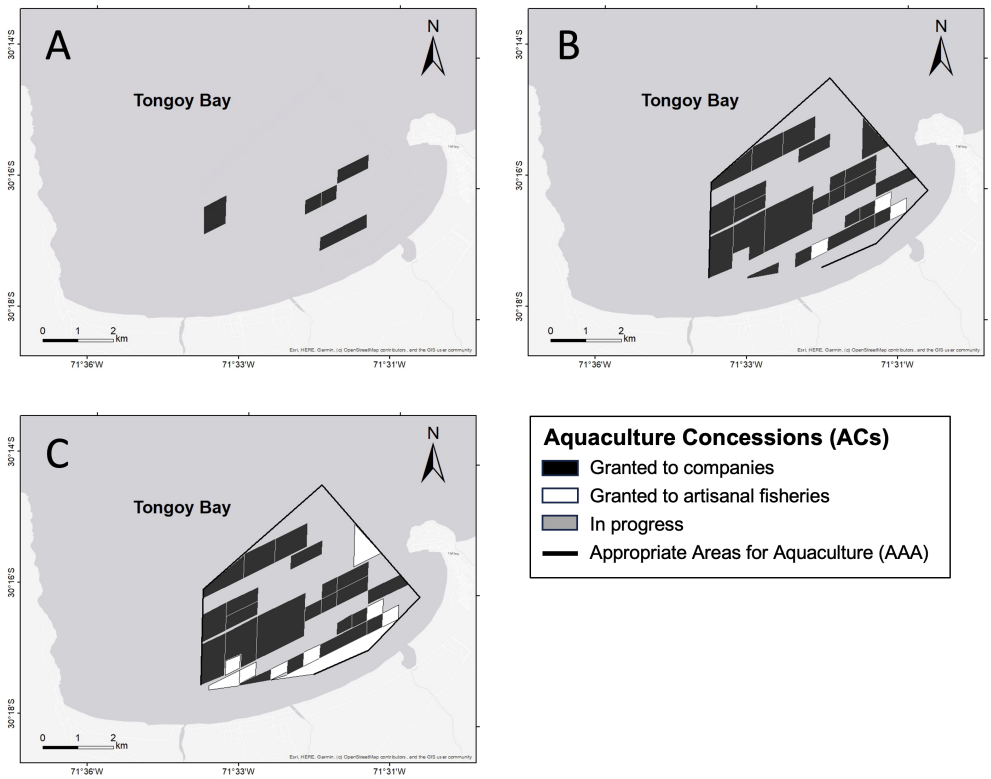

FIGURE 4
Study area and evolution of the spatial distribution of aquaculture concessions in Tongoy Bay. **(A)** 1990; **(B)** 2000; **(C)** 2010. (Subpesca; Retrieved on June 14, 2020).

companies, for their part, began operations under State protection, in the form of neoliberal policies which combined the promotion of private industry with governmental regulation/deregulation (Mansfield, 2004a). An Industrial Fishery Executive explained that industrial aquaculture companies located in Tongoy were aware that fishers viewed their location in exclusive farming areas as an intrusion:

"[t]he fact that overnight, [artisanal fishers] found they could not sail freely in Tongoy Bay and not work in the extraction was traumatic for them and was a source of conflict. So, it was a pretty tense situation".

- Industrial Fishery Executive.

Amongst the private sector, there was an awareness that fishers were increasingly restive at what they saw as companies' intrusion. However, under the premises of the new value regimes that the State had sought to establish in the bay, the establishment of strict property rules over the sea was perceived as legally correct. By extension, mechanisms of control to protect against illegality were also seen as warranted, since the end goal was to promote the industrial commercialization of scallops. This position accentuated problems with the fishers, who in addition to their dealings with State inspectors, began to enter into conflict with private security personnel. These guards had been hired by the companies to protect the latter's 'legitimate rights' over the ACs. Faced with this situation, fisher's leaders made efforts to make their demands visible and discussed them with various governmental bodies, mainly at the local level, without much success. Thus, artisanal fishers increased their practices of daily resistance (Scott, 1985) to defend their traditional rights over the coast and thus dodged the new regulations - practices developed at other times in history (Gayan and Dattwyler, 2017).

3.1.2 Scallop trafficking: illegal extraction and clandestine selling

One such practice was the trafficking of scallops (Stotz and González, 1997), defined by the FAO (2018) as illegal, unreported, and unregulated (IUU) fishing. Under cover of darkness, fishers would clandestinely enter the farming operations of industrial companies, extracting scallop which was then traded locally to trusted buyers. A former Bay fisherman comments that the procedure was as follows:

"We got up at six in the morning and you know what time we got home? At one o'clock the [next] morning, because we had to go in and out while it was dark. Everywhere the authorities were watching from the shore. Sometimes the boats got flipped over on the beach because at night you couldn't see anything, those dark nights. We used matches to see where we were so we could take out the scallops. The sacks [that we used] were 100 pound [around 46 kg] flour sacks. Each boat would take out two, three bags of scallops".

- Artisanal Fisherman and Scallop Farmer 2.

When asked about the motivations behind the scallop trafficking, fishers responded that they felt disregarded by the current fishing institutions. Since they could no longer develop the historic extraction of scallops that had been practiced over generations in the area (Figure 4), they were 'pushed' into stealing part of the production from the industrial farms that had set themselves up in the bay. The traditional and historical moral schema of the fishers justified the theft of the scallops because they considered the division of the sea and the restriction of extraction from natural beds to be illegitimate. A case of persistent clandestine extraction was seen in *La Rinconada*[4], which resulted in the failure of the conservation goals for *A. purpuratus* in the marine reserve (Avendaño et al., 2017).

3.1.3 Unionization, pressure on the State, and the 'first hunger strike under democratic rule'

The AG Tongoy began to press for a definitive solution of fishers's access to the ACs in the bay, seeking to break with what they saw as industry 'hoarding'. Since initial negotiations were unsuccessful, fishers began to carry out nondaily resistance measures (Scott, 1985). The year 1989 saw what was dubbed as 'the first hunger strike under democratic rule'[5]. Fishers and divers who took part demanded 'sea in which to cultivate'. In the first instance, the fisher's negotiating position sought to have the areas of the bay that they saw as unoccupied, transferred to AG Tongoy. Their leaders were, however, unaware that this marine space had already been requested for the development of industrial projects.

A former fisherman's leader reports that, in negotiations with the State, one of the arguments used to protect industrial economic interests in the bay was that these companies "generate jobs, pay taxes, export, and pay for everything". This argument, which dismissed the contribution of jobs provided by artisanal fishing almost as much as those offered by the industry (INE, 2009), presented a scenario for the emergence of another conflict between the moral framework adopted by fishers, who sought to ensure continued access to areas and resources they had historically used, and the neoliberal moral frameworks that promoted entrepreneurship and the privatization of economic fishing activity. The conflict was resolved when the State hit on the solution of placing a conditional expiry date on the concession of ACs to industrial concerns. The concessions now came with a condition requiring active use: if no development had been undertaken after the stipulated period of time, the expired ACs were to be transferred to the artisanal fishers.

Lobbying and mobilizations, combined with the access to ACs areas that was obtained through the AG, allowed fishers to gradually begin to dedicate themselves to scallop farming (Figures 2, 4). Access to ACs in the prevailing economic and regulatory climate, however, meant that fishers had to leave aside their own moral thinking, centered on historical rights to move freely around the bay to obtain a sufficient quantity of scallops for family subsistence, freely managing the days or hours devoted to work, and move to a new political economy, based on private property and salaried work with strict labor routines and formalities (i.e., number of days worked per week, adherence to schedules). In order to become farmers, fishers began to be entrepreneurs.

3.2 Political economy: private property, salaried work, and entrepreneurship in artisanal fishing

3.2.1 Technology transfer and restrictions on commercial exploitation

The Japanese suspended cultivation system was implemented in Tongoy at the beginning of the 1980s, under the supervision of Japan International Cooperation Agency (JICA) experts. Their arrival in Tongoy was at the behest of Subpesca (Uribe et al., 2018; Bakit et al., 2019). One of the first initiatives undertaken was the transfer of technology to artisanal fishers in the bay (Akaboshi and Illanes, 1983; Disalvo et al., 1984; Uriarte, 2008). This proved unfruitful because the RPA was not yet in force. Fishers were still free to move around the national territory exploiting natural banks (Soto and Villalobos, 2002). One fisherman commented that the reaction to the offer from JICA was indifference, as artisanal fishing generated better economic returns than aquaculture could offer at that time:

"[a]t that time there were still a lot of marine resources to extract, people didn't really believe much in cultivation. Why would we want to be working for a year, or two years; when on a good day, you could earn the same amount of money?"

- Artisanal Fisherman and Scallop Farmer 3.

JICA accordingly sought to transfer the equipment used for this cultivation technology to Sernapesca. Lacking resources for its implementation, Sernapesca approached the local university, the *Universidad Católica del Norte* (UCN), a training organization for all economic actors interested in aquaculture. The UCN obtained an aquaculture concession in Tongoy to implement the technology, built a Coastal Center, with support from JICA, and began to offer a range of aquaculture workshops (von Brand et al., 2016) to introduce the suspended culture system (Uribe et al., 2018; Bakit et al., 2019).

Industrial companies began to cultivate with this system, generating large economic returns from the export of scallops as a commodity (Bakit et al., 2022). Given the successful implementation in Tongoy, the Chilean State fishing organizations - following the moral framings proper to a neoliberal economy - found that the benefits of the suspended cultivation system should be extended to the artisanal fishers. After all, the fishers had repeatedly complained about the dwindling

4 The *La Rinconada* Marine Reserve, located in northern Chile, was created in 1997 to conserve natural stocks of *A. purpuratus*. Scallop harvesting was prohibited for both large-scale scallop aquaculture and artisanal fishers.

5 The reference is an allusion to the military dictatorship of 1973-1989, which was then drawing to a close, during which hunger strikes had become a favored tactic of organizations wanting to draw attention to political repression. Language editor's note.

economic opportunities caused by the decline of extractive fishing and the advance of industrial farming (Figure 4). The State responded to these complaints with a technology transfer program carried out by the industrial companies in a space close to the *caleta*. The State provided resources for the purchase of materials and made available an area of sea specifically designated for the transfer.

The fishers, therefore, learned to cultivate scallops in a space provided by the State in the project 'Training and Technology Transfer in the bays of Tongoy and Pichidangui' (Soto and Villalobos, 2002). However, the project had one major limitation. Sernapesca declared that the results of the technological transfer could not be sold, causing new conflicts with fishers once the authorities decided that fishers had mastered farming techniques and brought the project to an end. The closure placed fishers who persisted with the learnt practices in the area previously belonging to the project on the wrong side of the law:

"I have to take this sector away from you because you are 'illegal' here. The baseline objective was technology transfer. You've already done it; you've already learned, and now you are selling".

- National Fishery Officer 1.

Technology transfer allowed fishers to learn scallop farming techniques but did not guarantee access to sea resources. It was only by bringing pressure to bear on the State that they gained access to aquaculture concessions (Figures 4B, C), allowing them to make commercial use of their farms.

3.2.2 Granting of concessions to artisanal fishers: 'users of the waters'

The transfer of concessions was considered by the State to be a political decision, following neoliberal moral framings. Turning fishers into 'businesspeople', inserted in the international commodities market was seen as one way of lifting them out of the poverty and precariousness of artisanal work. To this end, it was essential to establish new property rules that would delimit the respective areas assigned to artisanal and industrial cultivations. Nine ACs were transferred to the guild (totaling ca 300 ha). The transfer, however, came with one condition: given that these areas had to be kept in the hands of artisanal fishers, and sustainably managed, the State imposed the condition that the ACs could not be sold. This protective measure was intended as 'life insurance' to prevent concessions from being sold on the open market (Pinkerton, 2017). When ACs ownership was granted to the guild, the artisanal fishers became 'users of the waters', meaning they had to pay the State for aquaculture permits in those sectors where cultivation was carried out. This concept of 'user' was at odds with the notion of historical rights to use certain fishing areas. The waters were, nonetheless, perceived as property that could be passed on from generation to generation:

"[a]s fishers, users of the waters, we set up our companies and all that … the terrain belongs to us, but the waters belong to the guild. It's a patrimony, so that tomorrow if our children want to be fishers, they have somewhere to cultivate their scallops".

- Artisanal Fisherman and Scallop Farmer 3.

Several programs and projects were implemented under the fisheries policies promoted by the State (Montoya, 2002; Bravo et al., 2007; Bakit et al., 2022) (Figure 3) encouraging fishers to form companies inserted into the international scallop market.

3.2.3 Salaried fishers and shareholders

With access to ACs through the guild and their acquired knowledge of the workings of the suspended culture system, the fishers dedicated themselves to scallop aquaculture (Figure 5). The AG Tongoy took the view that it was not able to take full commercial advantage of the boom of the resource as a commodity, and the support on offer from various public and private organizations. Instead, the AG Tongoy called on its members to form associations in order to access ACs. Some fishers organized themselves into *Sociedades Anónimas* chaired by a board of fishers-shareholders. This is how the first artisanal fishing company dedicated to the cultivation of *A. purpuratus* came into being.

The fishers - advised by executives and business consultants - were grouped into companies of approximately 18 people each. The number was calculated according to the availability of water for farming, although some companies were formed with fewer members. Due to the fact that fishers did not have financial capital for startup investment, their initial contribution was their capital labor, which generated some internal tensions, mainly due to the fact that the workforce that made up each company was uneven. Some fishers-shareholders failed to attend consistently to work on the farms, meaning that the previously defined work plans were not adhered to. These conflicts were accentuated when the scallop began to gain value. The fishers who had not contributed 'enough' work, nonetheless aspired to economic returns to which - in the opinion of those who had worked – they were not entitled. These tensions eventually led to the dismantling and/or reorganization of companies, since the fishers understood that if they were to be successful, they needed to exclude those who were not working in the common interest (Deacon, 2012). According to the recollections of one former fisherman and union leader:

"The work was usually scheduled, and it was understood that everyone was going to go to work. But not everyone went. There were those who believed in the cultivation, and the others didn't go. But when the product began to rise in price at the point of sale, those who hadn't gone at first were still sitting waiting for their money. That's where the rifts started."

- Artisanal Fisherman and Scallop Farmer 4.

An advisor who participated in the process commented that, over time, the fishers who contributed their labor became economically dependent on the companies. With the decline of extractive fishing, some shareholders began to work as salaried farm laborers. Fishers who had at first thought of the cultivation of scallops as a complement to their artisanal activity finally came to see it as their only means of subsistence. This economic dependence on cultivation generated a series of sometimes poorly understood changes at the level of organization and family budget. Farming, unlike extractive fishing, does not generate economic returns

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FIGURE 5
Contrast between livelihoods in the 1990s and 2000s **(A, E)** general view of Tongoy Bay; **(B, F)** Small boats for *A purpuratus* aquaculture; **(C, G)** Aquaculture boats; **(D, H)** Fishers and shareholders work respectively. ©Photos credits by Fajardo, M; Lira, G; and Bakit, J.

immediately and requires long-term planning to generate profits. Fishers were accordingly faced with a new economic rationality, requiring them to reinvest a large proportion of their profits:

"[We] began to buy boats for cultivation, because before, we worked with boats that were inappropriate for cultivation. We started by buying a couple of flat boats … However, as far as the family was concerned, when you got home on Saturday, after work, feeling the satisfaction of being part of this new world, at home they said, "So what do you have to show for your work?".

- Artisanal Fisherman and Scallop Farmer 1.

Another fisherman commented that planning was fundamental to the success of cultivation; whereas artisanal fishing had offered fishers the chance to satisfy their day-to-day and short-term needs, aquaculture called for a logic of medium and long-term planning. In order to continue working the farms, fishers were forced to save money to pay workers' wages, and purchase or repair materials, that is, the fledgling companies faced significant management challenges. The State offered a range of opportunities for training and technical advice, aimed at equipping the fishers with new administrative skills. A key instrument in this process was the

Associative Development Projects scheme (*Proyectos Asociativos de Fomento*, PROFO). In force since 1998, PROFO projects (Figure 3) have allowed fishing companies to obtain co-financing to hire professionals or strengthen organizational capacity through consultancies and training.

The PROFO project awards were the result of negotiations between AG Tongoy and the State. One advisor to fishing companies, who supported the design and adjudication of such projects, stated that guild leaders were conscious of the large volume of sales generated by their production and the tax revenue that resulted, which meant they were not inclined to view State support as a favor. Many of the fishers managed to achieve high turnover, which became an argument for demanding something in return from the State. The projects were viewed not as a subsidy, but as fair recompense. Thanks to the PROFOs, companies were able to consolidate boards of directors, composed of fishers-shareholders, with day-to-day management carried out by a professional manager. The results were in line with the expectations of the now entrepreneurial farmers, meaning conditions were in place to take the next step: direct export.

3.2.4 Businessmen and exporters of commodity fishery products: the "Bahia Tongoy" holding

As opposed to the old fisheries policy that encouraged small-scale fishing to satisfy domestic consumption (Nazer et al., 2009), fishing companies came together, in 2002, to create a platform for the export of scallops as a commodity. The main objective of the venture, known as the Bahia Tongoy Holding, was to trade large volumes of *A. purpuratus* on the international markets that were the main destination for Chilean scallops (von Brand et al., 2016). Acting on PROFO advice, the Bahia Tongoy board of directors, composed of fishers-shareholders, carried out a series of trade missions to France, Belgium, Spain, and Brazil to open new destination markets. Interviewees spoken to in the course of the present research acknowledge that 2003 and 2004 saw a peak in the commodity price of scallops. A subsequent fluctuation in the price of the dollar, however, considerably affected the commercial performance of the holding:

"The dollar started to be very unstable. We would harvest one day, and the dollar would be equivalent to six hundred pesos. But the next month, when it came time to send the container of scallops, the dollar exchange rate had dropped. We started to make large losses on each container exported".

- Artisanal Fisherman and Scallop Farmer 5.

In the 2000s, Peruvian scallops (known as *Concha de Abanico*) intensified their presence in the international market. The production was mainly of *A. purpuratus* extracted from the seabed of natural banks, free from the high production costs of the suspended cultivation system implemented in Chile (Molina et al., 2012; Uribe et al., 2018; Kluger et al., 2019). Competition on price became impossible, and many Chilean companies, both industrial and artisanal, were forced to lower their costs and/or apply for large bank loans to continue in operation. Some professional advisors recommended that fishers-shareholders apply for individual loans from financial institutions to maintain their farming activity. Many agreed but found it impossible to service or pay off the acquired debt. Personal and family assets and wealth suffered; many fishers mentioned feeling sorry for their peers, on seeing them lose their homes and any prospect of a return on the work they had put in over the course of many years:

"We had to pay ninety-six million pesos [approximately US $100,000] over five years. We finished paying in 2015. Many of the company's dreams went overboard. Some [people] lost their homes. Others are still paying off their debts. Others liquidated the companies and sold everything".

- Artisanal Fisherman and Scallop Farmer 1.

Artisanal fishing companies, including Bahia Tongoy Holding, began selling their product on the domestic market as a survival strategy (Uribe et al., 2018). This led to fierce competition, and many companies did not survive (Bakit et al., 2022). Bahia Tongoy Holding disappeared in 2004, and in 2011 a tsunami, triggered by an earthquake in Japan, destroyed a good part of the cultivation (Bakit et al., 2022) that had survived the dollar crisis and the entry of the Peruvian scallop onto the international market:

"We started selling to the national market, and then we lost control. We started competing with each other. The price went down until small businesses began to disappear. Between 2003 and 2004 the Bahia Tongoy Holding disappeared. It was liquidated".

- Artisanal Fisherman and Scallop Farmer 5.

The introduction of *A. purpuratus* from Peru onto the international market, together with the refinancing that companies undertook in an attempt to stay solvent afterward, finally triggered a series of bankruptcies that reconfigured the production scenario in Tongoy Bay.

3.2.5 Neoliberal economic rationality: entrepreneurship in success and individual responsibility in the failure

Asked about the barriers that were faced by fishing companies, one guild leader replied that a major failing had been the decision to organize into companies, where some worked more than others. For this reason, after the series of bankruptcies and the decline in activity, AG Tongoy began to make part of its ACs available to farmers. With experience and/or family support, farmers were able to develop the activity individually or in family groups. This new way of organizing production benefited from the availability of low-cost farming materials, following the bankruptcy of most businesses.

Key players from the guild commented on one major difference between this new form of concession and the previous one. Under the old arrangement, up to ten people might be involved in a single line of cultivation, for example, the groups of fishers who initially formed the companies. Currently, any given person who has access to a farming unit can reap the benefits of its entire production, without having to distribute the profits among shareholders who did not necessarily take part in the work. This change has come about because, unlike in the first fishing companies, each individual farmer is now formalized into an Individual Limited Liability Company (EIRL, after the Spanish acronym), supported by AG Tongoy as a marketing platform. A former fishing company advisor comments that individual farms are accordingly better for organizing artisanal

production than companies. Fishers now take an active part in their farms, understood as 'personal entrepreneurship':

"I think individual farms are better. As a result of his effort, the fisherman manages to cultivate, seeing when he sows the seed, works, reaps the harvest, and generates sales. Before, because of the large groups, money was distributed among many people. Now it works better, and you also notice which people are more enterprising".

- Business advisor 2.

Some fishers continue to be shareholders in companies, while simultaneously developing individual farms through EIRL. They receive economic benefits as shareholders in the companies, as well as profits from their own work on their personal farms:

"My brother and I, who was 'head of the sea' in this company, just upped and left one day. We wanted to set up another company, but without completely severing our ties with the first one. A lot [of fishers-shareholders] totally disassociated themselves from [the companies], took their cut, and left. We didn't: we're still here. But we have our own company, and that takes up all our working time, because the original company is run by its board of directors and administration, so I only come in for meetings".

- Artisanal Fisherman and Scallop Farmer 3.

Since the mid-2010s, a cooperative has been set up within AG Tongoy to bring together individual farmers. Like other cooperatives, this one coordinates the joint purchasing of cultivation materials and tries to improve post-harvest practices and facilities (Deacon, 2012; Bennett, 2017). However, although cooperatives collectivize some activities, in the case of the Tongoy scallop farmers, there are differences as they consider the responsibility for production and sales to rest with each individual and not with collective grouping bodies. A business advisor to fishing companies explains:

"[e]very farmer is in charge of whether to make or sell. He sells through the cooperative but sells to whomever he wants. The cooperative helps us to buy materials together, getting together as if we were in a club, but the responsibility is individual".

- Business advisor 1.

Here, we can detect how neoliberal economic rationality has circulated from the private sector to artisanal fishers, through industries and advisors, and with the support of the State. The fishers have renounced traditional moral schema to embrace entrepreneurship. They explain success in farming by attributing it to the entrepreneurial nature of certain people, who manage to make their respective businesses profitable through personal effort. The parceling out of the sea, and the regionalization of fishers through licensing - the rule changes whose introduction so threatened the lifestyle of artisanal fishers - are not called into question.

4 Conclusions

Neoliberalizing approaches to fisheries development have driven marked geographical transformations in the political economy of the oceans (Mansfield, 2004b), without necessarily having the expected positive impacts on fisher's incomes (Pinkerton, 2017). Some scholars argue that property rights benefit society where the ownership is diffuse and the entrepreneurs heterogeneous (Terrebonne, 1995). However, in this paper we show how, in a highly commodity-dependent sector of an economy, the economic benefits of parceling out the sea are finally captured by actors whose material conditions of production allow wealth to accumulate according to a strict neoliberal economic rationality. As Pinkerton (2017) already stated, "[t]his may serve as a reminder that neoliberal claims to benefit society at large should be understood as claims to benefit those who are able to accumulate wealth".

At the same time, technological innovations for the development of fisheries did not necessarily generate the expected results. This is especially true if they are transferred unilaterally and vertically, as we have seen in the case of Tongoy Bay. Other social conflicts related to the development of aquaculture and the introduction of specific fisheries have been identified in the literature, including disputes over the distribution of burdens and benefits, the clash between industrial production and traditional fishing models, decision making, and the regulation of marine areas and their resources. These conflicts have emerged in contexts as diverse as in Europe (Ertör and Ortega-Cerdà, 2015), Australia (Condie et al., 2023), Canada (Wiber et al., 2021), and India (Adduci, 2009). In the case of the Japanese suspended cultivation system implemented in Tongoy, the adoption of technology as a model of the privatization of fishing also shows results that differ from those initially planned, as well as an increase in social conflicts derived from the division of the sea and regionalization.

However, the case of Tongoy shows how these economic-political changes (especially the division and privatization of the sea) and technological reforms lead to tensions and conflicts. These conflicts derived from the clash of these measures with the principles of access and sharing of resources (i.e., moral economies), and relations between the different actors. Some principles emerged that drove practices of everyday resistance to protect access to historical resources and fishing areas, as well as unionization and direct pressure on the State through hunger strikes. Our study shows that failure to reach horizontal agreements with fishing communities can lead to ineffective fisheries policies and that enhanced State understanding of coastal communities' perceptions of resources is crucial for a just transition towards sustainability transformations.

The temporal course of the case demonstrates how a moral economy is changed in a short space of time, with some of Tongoy's artisanal fishers adopting moral schemes and practices in line with the State's policy of entrepreneurship and export-oriented production. This adoption, in line with what has already been noted by Coulthard et al. (2011) facilitated relationships between fishers, farmers, and the State, increasing over time the degree of community inclusion, trade benefits for some, and effective governance of the sector. However, identifying the underlying moral criteria is a useful step toward analyzing the relational aspects integrated into local perceptions of justice. The persistence in forbidden practices of ignoring the law constitutes in itself a political statement that can trigger a potential radicalization of some marginalized groups.

An indication of the underlying moral criteria indicated above is that some fishers have taken on board the idea that they must

become entrepreneurs, acquire property rights, and form enterprises that allow them to be competitive. If this cannot be achieved, blame is held to lie with the individual: 'some people are more enterprising than others'. Unequal results are thereby considered to be justifiable, insofar as the efforts invested in work are perceived as uneven. There is a move from a traditional moral economy, centered on collective and historical rights to family subsistence and free movement along the coastal territory, to a neoliberal moral economy centered on the individual and his or her self-improvement through efficient management of work.

It is noteworthy that this change in moral economies is neither automatic nor unidirectional, since during the period described there was a systematic action by the state to favor it - directly or indirectly - through regulations that promoted and prevented certain practices. Despite the adoption of neoliberal guidelines, aspects of a more traditional moral economy remain, such as the role of family units in the configuration of businesses.

Moreover, some issues remain unknown, such as the fact that the crisis of private enterprise in the 2000s did not lead to a generalized overturning of fisher's moral practices and patterns, decimating confidence in the neoliberal framework. Diachronic approaches and case studies such as the one analyzed here could be the way to better understand all the changes associated with the irruption of neoliberalism and other economic-political changes. The case of Tongoy and scallop production can serve as a contrast and comparison with other localities and fisheries also subjected to sudden market pressure and intensive modernization processes.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

JB: Conceptualization, Methodology, Investigation, Formal analysis, Data curation, Writing – original draft, Writing – review and editing, Funding acquisition, Supervision. AH: Conceptualization, Methodology, Investigation, Formal analysis, Resources, Data curation, Writing – original draft, Writing – review and editing. RM: Methodology, Validation, Formal analysis, Writing – review and editing. SV: Formal analysis, Writing – review and editing, Visualization, Funding acquisition. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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