

Beyond Discards: Blue Justice for Portuguese Artisanal Fishers

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Abstract

This critical ethnographic study examines the recent commercialization of discards in the artisanal fishing called Arte-Xávega in Costa da Caparica, Portugal, through the lens of blue justice. Drawing on 129 semi-structured interviews and participant observation over 83 field visits (2024–2025), the article traces the shifting trajectory of discards: from their historical use as agricultural fertilizer and former abandonment on beaches to their current commercialization as low-cost feed for tuna aquaculture. The study asks whether incorporating discards into industrial value chains deepens the vulnerability of small-scale fishers and makes three contributions to blue justice literature in different directions. First, it demonstrates empirically how the conditional commercialization of discards, while reducing beach discarding, exacerbates economic marginalisation through industrial pillaging and value chain grabbing of the commercial catch. Second, it shows how top-down regulations exclude fishers from decision-making and reduce their participation. Third, it problematises the commercialization of discards, revealing that market integration can generate new forms of dependency and volatility rather than greater justice. Findings reveal that discards commercialization is embedded in unequal power relations, where large-scale corporations appropriate resources from the fishing community. Territorially integrated alternatives such as agricultural use of discards and menus for self-consumption are (re)emerging as bottom-up pathways, but remain incipient and face structural barriers. At the same time, this study seeks to promote an approach to equity that gives prominence to the voices of the fishers themselves through their local knowledge, fostering a more transversal dialogue with the theoretical framework itself, in pursuit of greater intellectual justice.

Keywords

Arte-Xávega; artisanal fisheries; blue justice; fishing discards; Portugal; small-scale fishing; value chains

1. Introduction

The discussion on the future of the oceans has historically been dominated by approaches centered on the exploitation of marine resources (Ertör, 2023), i.e., the blue economy or blue growth, which seek to reconcile economic growth with the conservation of marine ecosystems (Martínez-Vázquez et al., 2021). However, this model has generated strong controversy due to its environmental and social consequences (Schutter et al., 2021), revealing a hegemony that has systematically ignored the biophysical constraints of ecosystems (Eikeset et al., 2018). In response, various critical strands have proposed alternatives aimed at making the use of ocean ecosystems ecologically and socially viable (Hadjimichael, 2018).

This critique of “sustainable exploitation” affecting the oceans (Jankowsky & Mesquita, 2024) acquires particular relevance when examining its impact on coastal communities, which have historically depended on equitable access to marine resources for their social and cultural reproduction. Indeed, the struggle for justice among these communities has a long history (Bennett et al., 2022). In this context, blue justice emerges as a critical lens for analyzing how coastal communities access, use, and manage marine resources (Blythe et al., 2023). At the same time, blue justice acts as a counter-narrative to the aforementioned hegemonic models (Jentoft et al., 2022). Far from being confined to theory, blue justice gains relevance when examining empirical phenomena across various parts of the world, such as resource grabbing, the unequal distribution of economic benefits, and the sociocultural impacts arising from the commodification of the sea (Bennett et al., 2021). Building on this framework, recent scholarship has identified multiple forms of blue injustice that disproportionately affect small-scale fishing communities, including fisherphobia, participatory domination, sidelining from governance, cultural violation, industrial pillaging, recreational assault, and value chain grabbing (Arias Schreiber et al., 2022).

This interest in (re)thinking economic development in conjunction with social justice is clearly materialized in the management of an ostensibly marginal resource in artisanal fisheries—discards. This occurs in a context where oceans have become part of a globalized discourse on economic growth (Jouffray et al., 2020). By applying the critical lens of blue justice to a local community, the need arises to analyze what happens when these discards begin to be absorbed by an industrial-level value chain. This prompts an inquiry into whether this practice constitutes a sustainable alternative or, on the contrary, deepens the vulnerability of artisanal fishing communities. Through a critical analysis of how global ocean development agendas affect coastal communities at the local level (Isaacs et al., 2022), artisanal fishing can offer a better understanding of the tensions resulting from this interaction. The Arte-Xávega fishing practice exemplifies this, as discards reflect some of the conflicts that blue justice can bring to light.

Arte-Xávega is a form of artisanal fishing recognized as an intangible cultural heritage (Silva, 2016), practiced in Costa da Caparica within the Lisbon metropolitan area and in several other coastal areas of Portugal. This fishing art takes place on the beach and consists of the boat entering the sea, forming a curve to encircle an area of marine organisms. In the past, the net was hauled manually, and the boats were moved by rowing. Currently, the catch is pulled to the beach using tractors, and the boats are equipped with engines (Figure 1), which has led to a notable reduction in the human physical effort required (Silva, 2016). Regarding the Portuguese legislative guidelines, the practice of Arte-Xávega includes the prohibition of abandoning discards on the beach, a limitation on the number of tractors, control of new or current Arte-Xávega authorizations, and spatio-temporal fishing restrictions (Ministério da Agricultura, do Desenvolvimento Rural

e das Pescas, 1996). The fishers organize themselves into “*companhas*,” and each consists of 10–15 fishers with different functions on the boat and on land, operating jointly under the leadership of the boat owner (Partibridges, 2021).



Figure 1. Aerial photograph of Arte-Xávega. Note: Photograph taken by the authors in Costa da Caparica, 17 October 2025.

This fishing art is classified as an enveloping or dragging technique (Martins et al., 2000) and one of its main characteristics is its low selectivity, approximately 60% of the catch is being sold at the fish auction house (hereinafter referred to simply as the auction house), 20% being sold on the beach, and the rest being discarded (Martins et al., 2000). Three species tend to predominate in the catches (Antunes, 2007; Souto, 1998): Sardine (*Sardina pilchardus*) along with Atlantic horse mackerel (*Trachurus trachurus*), and Atlantic chub mackerel (hereinafter referred to as ACM; *Scomber colias*). Although abundant and highly nutritious, the ACM has historically been undervalued nationwide due to its low economic and sociocultural value, leading to its discard after capture (Lucas, 2024). Nowadays, ACM is exported to feed tuna aquaculture in Spain and parts of Portugal, escaping its historical discard (Gonçalves, 2015).

Discards from Arte-Xávega have followed a dynamic historical trajectory locally (Partibridges, 2021). Oral testimonies indicate that discards were used as agricultural fertilizer decades ago, helping transform Costa da Caparica's muddy areas into today's agricultural land (Pereira et al., 2022). This reflects a practice undertaken by Portuguese coastal communities, which used seaweed and Henslow's swimming crab (hereinafter referred to as the swimming crab; *Polybius henslowii*) to fertilize the land, an activity now completely extinct (Oliveira et al., 1990). At the local level, apparently, from the 1970s onward, discards were abandoned with increasing frequency despite being considered undesirable (Regulation (EU) 2019/1241 of the European Parliament and of the Council of 20 June 2019, 2019). In 2025, discards began to be commercialized, reflecting a similar practice already established with ACM. This commercialization niche apparently “improved” the sustainability

of Arte-Xávega by drastically reducing beach discards. However, it further marginalized the already precarious market value of ACM and exposed the poorly understood value chain dynamics within Portuguese artisanal fisheries (Costa et al., 2022), particularly for Arte-Xávega.

Using a critical ethnography (Thomas, 1993), this study aims to amplify the voices of Arte-Xávega fishers and present their perspective on the contingent situation of discards and their uses in recent years. Through this, it seeks to explore how the blue justice framework can serve as a tool for analyzing whether the commercialization of Arte-Xávega discards constitutes an economic threat. This process could transform the livelihoods and identities of this community by gradually exposing it to industrialized dynamics. Furthermore, it posits that the collective planning of alternative uses, such as for self-consumption or agricultural purposes, may represent a more just and sustainable option.

For a better understanding of this article, the structure of this work is organized as follows: (Section 1) Introduction, this section discusses the background that contributed to the emergence of blue justice and its principles, as well as general characteristics regarding Arte-Xávega and its discards; (Section 2) methodology, this section introduces the study area, critical ethnography, and its respective methodological design; (Section 3) ethnographic findings, this section presents the findings related to fieldwork on discards, the species that compose them, some of the reasons for their discard, and some of their territorially integrated alternatives; (Section 4) discussion, this section discusses several findings in light of blue justice; (Section 5) final reflections, this section outlines the contributions of this article to blue justice and recommends future studies.

It is important to clarify that in both Sections 3 (ethnographic findings) and 4 (discussion), findings were intertwined with theoretical concepts and the voices of the fishers. This was done under the argument that description is never free from theory but rather is part of a constant dynamic process. Thus, theory functions as an instrument of perception, contributing to the understanding of meanings rather than predictions (Geertz, 1973). This approach enabled the voice of fishers to interact with other forms of knowledge, thereby constituting an act of intellectual justice (Smith, 1999).

2. Methodology

2.1. Study Area and Critical Ethnography

The study area of this research was Costa da Caparica, a city with approximately 15 thousand permanent inhabitants and located on the south bank of the Tagus River facing Lisbon (Stratoudakis et al., 2023). This city forms part of the Setúbal Peninsula (Mesquita, 2014; Figure 2). The groups of Arte-Xávega are distributed across two different sub-localities: Costa da Caparica and Fonte da Telha (Mesquita, 2014; Stratoudakis et al., 2023). These sub-localities have a total of nine fisher groups: five in Costa da Caparica and four in Fonte da Telha, where one group from the first locality is inactive and at risk of disappearing due to a lack of registered hauls.



Figure 2. Study area with the sub-localities: Costa da Caparica and Fonte da Telha. Source: Esri (2025). Note: Edition made by the authors.

The choice of critical ethnography as a methodological approach (Thomas, 1993) was shaped by the nature of both previous research projects (see Partibridges and Smart Fishing projects) and the vulnerable context of the community under study (Mesquita, 2014). In contrast to a more descriptive form of ethnography (Eriksen, 2017), which documents “what is,” critical ethnography advances a reflexive exercise guided by the question “what could be?” (Thomas, 1993), framed through a utopian and imaginative lens (Escobar, 2012). This distinction proved fundamental to the study of discards in Costa da Caparica, where the researchers of this article from the Ocean Literacy Observatory are themselves part of the world they seek to account for from a holistic perspective, rather than separate from it (García, 2025). This approach facilitated working alongside fishers to understand the implications of the commercialization of discards in terms of justice, while also exploring possibilities for collective action. From this perspective, the research unfolded under a collaborative logic: working with them, including during fishing, aiming to de-verticalize the relationship with the community and prioritize their interests and narratives as the central axis of this research.

2.2. Methodological Design

The fieldwork was divided into two distinct phases, each with slightly different objectives. The exploratory phase involved 28 field visits between February and December 2024. The main objective of this phase was to gain an initial understanding of the Arte-Xávega, its organization, and to establish channels of collaboration

with some of its leaders. Furthermore, this stage contributed to the production of observation guides in order to more efficiently delimit the aspects to be observed and to transform them into more detailed descriptions (Olivier de Sardan, 2018). The second phase was systematic and consisted of 55 field visits carried out between May and December 2025. The main objective of this phase was to engage with one of the nine Arte-Xávega groups. For comparative purposes, visits were also conducted to the other eight groups, although without the same level of immersion as that achieved by participating in the fishing process itself.

During both phases, the main data production techniques used were participant observation and semi-structured interviews ($N = 129$). Interviews were conducted primarily with the aforementioned group of Arte-Xávega ($N = 100$), representing 77.5% of the total interviews. The remaining interviews were distributed among the other groups, including one farmer from the same locality who is also affiliated with an Arte-Xávega group, contact with whom was facilitated by the engagement achieved during the first exploratory phase of the fieldwork. In both cases, the selection of participants for the interviews prioritized diversity in terms of ages and roles: the leaders of each group (usually boat owners), the elderly (older fishers), and the fishers (regular hired workers). However, when a deeper understanding of specific aspects of Arte-Xávega was required, the group leader and/or veteran fishers were consulted. In the group where the greatest immersion took place, interviews emerged spontaneously through daily coexistence, primarily during the fishing itself. Nevertheless, some interviews were conducted in different activities, i.e., collective meals, weaving nets, tractor and boat repair, among others. To preserve confidentiality, some identifying details regarding specific groups and practices were intentionally omitted or generalized throughout this article.

The ethnographic data produced during fieldwork were recorded in field notes, a field diary, and audiovisual material, all of which were stored on personal devices, ensuring the confidentiality of the participants after informed consent to conduct the research was obtained. The processing and analysis of the data were grounded in the principles of ethnography, which involved the glossing of the field diary using analytical categories to organize, reduce, and make sense of the dispersed information (Díaz de Rada, 2011). This was complemented by thematic analysis, which allowed for the identification of patterns, recurring themes, and significant relationships for theoretical interpretation (Braun & Clarke, 2021). This process entailed the repeated reading of field notes and transcribed excerpts from interviews regarding discards and their commercialization, as well as certain perceptions of (in)justice among Arte-Xávega fishers. Given the collaborative and immersive nature of the fieldwork, interpretation was also shaped through ongoing dialogue with fishers and continuous reflexive engagement regarding the researchers' positionalities within the field.

3. Ethnographic Findings

3.1. Sale of the Catch

The destinations of the Arte-Xávega catch are diverse, with sale, self-consumption, and beach discarding being the most common at the local level (Alvarado & Mesquita, in press). Sales are conducted through the auction house, of which there is one in Costa da Caparica and another in Fonte da Telha. The auction house is a physical space administered by the government for the reception, auction, and delivery of catches from different fishing arts. It is also responsible for the unloading, handling, conservation, and storage of the catch (Direção-Geral de

Recursos Naturais, Segurança e Serviços Marítimos, n.d.). The auction house is where the first sale takes place by means of an auction, locally known as “leilão,” a process that could not be observed or directly accessed for participation.

Locally, this auction follows a descending dynamic:

The auction house knows the current market prices [of marine organisms], increases them slightly, and then they [the first buyers] start making bids as the price drops. Afterwards, the final price may end up above or, as usually happens, below the market price. Generally, auctions go upward; we don’t understand why with us it is the opposite. (Fisher, Costa da Caparica, December 2025)

This allowed for a better understanding of how the process operates: if a specific quantity of marine organism has a market price, the auction house offers it at a higher value, and during the auction, this value progressively descends until an interested buyer is found. This dynamic reflects the limited or non-existent participation of fishers in price negotiation, which in turn leads to the undervaluation of the catch: “Furthermore, they [the first buyers] organize themselves off the record to avoid competing [among themselves] and only make bids when the price drops to the figure they have agreed upon,” the fisher concluded. Fishers are usually not physically present during the auction. However, some leaders follow the process by telephone, which may be related to the fact that the auction house environment is highly controlled and somewhat hermetic. Participating in the auction requires prior authorization, and the presence of outsiders may make participants uncomfortable, to the extent that filming and taking photographs during the process are prohibited.

As an alternative to the above, and although fishers avoid discussing the subject since it is not regulated by law (Ministério da Agricultura, Pescas e Florestas, 2005), the sale of marine organisms on the beach is common, particularly in summer, and represents more equitable economic benefits without intermediaries (Alvarado, in press). The other form of sale is the one specifically destined for aquaculture in Portugal and Spain, which is a process that was not verified in this research. This is the case of ACM, which represents one of the most frequently captured species at the national level. However, it is not considered a target species but rather an incidental catch in relation to other species, i.e., sardine, which, in addition to sharing similar ecological habits with ACM, represents one of the most important fishery resources in the Iberian Peninsula (Gonçalves, 2015) and holds high media visibility. This category is locally known as “dorna” (in English, fish box; Figure 3), a square plastic container that holds up to 250 kilograms of fish and, once filled, is sold for 70 euros each (0.28 euros/kg). This fish box is destined for the commercialization of highly abundant species with low market value, i.e., ACM (Alvarado & Mesquita, in press). However, if other species, i.e., sardine or Atlantic horse mackerel, are overabundant in the haul and exceed buyer demand at the auction house, they are directly allocated to the fish box, incurring a depreciation of their market value as they automatically acquire the value of ACM.

The commercialization of ACM—little known in depth—emerged only a few decades ago when, through the initiative of some local fishing leaders, a triangular arrangement was established to export ACM to Spain (Partibridges, 2021) and some parts of Portugal (Gonçalves, 2015) for use as feed in tuna aquaculture. This represented an economic and sustainable alternative to avoid its historical discarding: “Before, we would place the ACM on the beach so that boats could slide over them. They never had [local] value” (Elderly fisher, Costa da Caparica, February 2024), and “If the fish box would not exist, all ACM would be discarded on the beach”

(Fishing leader, Costa da Caparica, November 2024). One of the conditions for the sale of ACM for export was that only this species should be added to the fish box, without extra care, such as thorough washing or size sorting, which differs from other, more valued species destined for human consumption (Alvarado & Mesquita, in press).



Figure 3. Fish box with sardines. Note: Photograph taken by the authors in Costa da Caparica, May 2, 2024.

3.2. Discards Within Arte-Xávega and Their (Recent) Commercialization

To better understand the discards of Arte-Xávega, it is necessary to gain a deeper understanding of the definition. The definition of fishing discards can vary, but generally refers to organic material (living or dead) of animal origin that is discarded or dumped at sea (FAO, 1996). One of the most significant characteristics of Arte-Xávega discards is that they are often left on the beach sand after sorting, a practice prohibited by law (Ministério da Agricultura, do Desenvolvimento Rural e das Pescas, 1996). This abandonment allowed for the estimation of approximate quantities and the characterization of the most representative species, carried out in collaboration with fishers (Alvarado & Mesquita, in press).

Many of the species registered in Arte-Xávega catches at the local level are likely to be discarded due to highly variable factors, including size, quantity, condition, species type, and body part, among others. In previous research, quantities ranging between 5 and 200–400 kilograms were registered, corresponding mostly to swimming crabs, which have no market value (Alvarado & Mesquita, in press). To better understand the discard quantities, it is important to know that the total catch per haul tends to range between 0.5 kilograms and 1 tonne, with a historical maximum of 10 tonnes (Alvarado, in press). Regarding discard ratios, these tend to range between 20% and 40%, with extreme cases reaching 75% (Louro, 2016). However, fieldwork conducted

for this research revealed that high percentages may be influenced by the (high or low) quantity of the catch. This is explained as follows: if the haul contains a small catch predominantly composed of discards, then the discard percentage will tend to be high. This does not necessarily mean that discard quantities are always very large, as might be inferred from a reading limited to percentages.

Despite the variation in species discarded in Arte-Xávega, this research produced approximate quantifications, identifying several species that are invariably discarded after capture for various reasons (Table 1), namely: barrel jellyfish (*Catostylus tagi*), swimming crab, garfish (*Belone belone*), golden kelp (*Laminaria ochroleuca*), lesser weever (*Echiichthys vipera*), and tub gurnard (*Chelidonichthys lucernus*). It is important to mention that from mid-September of the second fieldwork phase (2025), the occurrence of barrel jellyfish increased substantially, although their presence is relatively constant in adjacent areas such as the Tagus estuary (Gueroun et al., 2021). These organisms were categorized as discards (Alvarado & Mesquita, in press). However, quantities since their appearance until late November ranged between 5 and 10 kilograms, with an extreme case of approximately 300 kilograms in a single haul (Figure 4).

Table 1. Main discarded species, local uses, and main reasons for discarding.

Species and common name	Local traditional use	Main reasons for discards
<i>Belone belone</i> , garfish	Self-consume (usually large specimens)	The translucent flesh, along with the blue-green spines, gives it a rotten appearance
<i>Catostylus tagi</i> , barrel jellyfish	To slide boats on the beach	No market value or local use, other than the belief that it is possibly poisonous
<i>Chelidonichthys lucernus</i> , tub gurnard	Self-consume (only medium-large specimens)	Adult specimens can be commercialized. However, those caught by the Arte-Xávega are small and have no market value
<i>Echiichthys vipera</i> , lesser weever	No information	Although adult specimens are consumed in some areas of Portugal (i.e., Setúbal), the small specimens from Costa da Caparica have no market value
<i>Laminaria ochroleuca</i> , golden kelp	No information	Lack of market value
<i>Polybius henslowii</i> , swimming crab	Soil fertilizer and fishing bait	Lack of meat for food and lack of market value

It was significant to note that the treatment afforded to the barrel jellyfish was perhaps the least careful compared to others. For instance, a juvenile sole (*Solea lascaris* or *Solea senegalensis*) or a common octopus (*Octopus vulgaris*) that does not meet the size requirement for sale are returned to the sea alive with special attention from fishers, whereas dead individuals are discarded or consumed (Figure 5): “Look at it, poor little thing [juvenile sole]. We have to return it to the sea” (Fisherwoman, Fonte da Telha, July 2025). Conversely, barrel jellyfish receive different treatment, including kicking, mutilation, and throwing, among other actions. This demonstrates the differential life valuation assigned to species caught and discarded in Arte-Xávega. This may be a consequence of the fact that this species, much like ACM, apparently has never had an alternative use to discarding:

In the past, we would place them [jellyfish] on the sand so the boats could slide over them, but no one has ever used them for anything else. The grey ones have a toxic substance that can cause blindness. (Elderly fisher, Costa da Caparica, November 2025)



Figure 4. Barrel jellyfish discarded on the beach. Note: Photograph taken by the authors in Costa da Caparica, 18 October, 2025.



Figure 5. Fishers returning part of the living catch to the sea: on the left, a juvenile sole and on the right, two octopuses. Note: Photographs taken by the authors in Fonte da Telha, 19 September 2024 (left); Fonte da Telha, 11 August 2025 (right).

The incorporation of discards into the market apparently emerged suddenly during the second fieldwork phase of this research in 2025, when, during a local fishing event, a fisher leader announced the developments for the Arte-Xávega season: “This year we will start fishing at the end of May and we will include discards in the fish box [along with ACM] at the client’s request [apparently the Spanish buyers]” (Fishing leader, Trafaria, May 2025). Although explicit evidence is lacking, this research suggests that the first exploratory fieldwork phase of this research contributed to drawing attention to discards within the Arte-Xávega community from a more transversal perspective (Alvarado & Mesquita, in press) and may have facilitated subsequent discussions

with fish box buyers. Despite the above, it was only several months later that the buying and selling conditions for discards became more fully known: discards would be included together with the ACM fish box, but under the condition that the purchase price of the fish box would no longer be 70 euros (0.28 euros/kg), but rather 60 euros (0.24 euros/kg). “Each fish box sells for 70 euros [with ACM only], but if it has mixed products [discards], it is 60 euros” (Fishing leader, Fonte da Telha, June 2025). In addition to the price modification, another condition was the exclusion of certain fish species, i.e., bogue (*Boops boops*):

This year, we are including [in the fish box] other species like swimming crabs. Before, they [the buyers] wouldn’t let us mix them [ACM with discards]. Now the buyer’s only condition is not to include bogues, but we eat them here. (Fisherwoman, Costa da Caparica, November 2025)

Evidence of this was observed when some fishers separated part of the discards for separate sale, i.e., swimming crabs for anglers on the Tagus River (Figure 6), or simply included discards in the fish box, i.e., tub gurnard (Figure 7).



Figure 6. Swimming crabs for commercialization. Note: Photograph taken by the authors in Costa da Caparica, 14 August, 2025.



Figure 7. Fish box with sardines and tub gurnards. Note: Photograph taken by the authors in Costa da Caparica, 27 October, 2025.

3.3. Agricultural Uses and Subsistence Practices

The practice of using discards to fertilize agricultural areas has been documented in northern and central Portugal (Oliveira et al., 1990). In Costa da Caparica, despite the scarcity of specific bibliographical references, this practice has been carried out, albeit recorded only orally: “Before I was born, I know that they [farmers] used to come to take the swimming crabs to fertilize the land” (Fisherwoman, Costa da Caparica, November 2025), or “They [farmers] would arrive [in the past] on wooden wagons and take away about 500 kilos of crabs [for agriculture]” (Elderly fisher, Costa da Caparica, November 2025). This practice was discontinued for unknown reasons (Alvarado & Mesquita, in press). However, since 2024, some approaches have been made between fishers and local farmers, apparently through local projects linked to farmers’ associations. Although this rapprochement might seem straightforward, the historical relationship between both groups has not been particularly close: “There is a rivalry with farmers. I do not know why,” the elderly fisher concluded.

In 2025, it was possible to contact a local farmer with ties to Arte-Xávega through his son, who is a fisher in a different group from the one with which this research collaborated. Such cross-class linkage is uncommon, yet it appears to exist in specific cases: “There [in fishing] are fathers of fishers who are [or were] farmers, [so] there are some fishers who still know how to work the land, but generally they do not get along [between both groups]” (Fisherwoman, Costa da Caparica, November 2025). Approaching this local farmer was not a simple task, primarily due to his affiliation with a different Arte-Xávega group. It is important to underscore the complexity inherent in collaboration between fishers from different groups and even more so with farmers. This lack of unity within the fishing class has already been identified and prioritized by the community itself as one of the primary concerns of local artisanal fishing (Partibridges, 2021). The farmer commented that the use of discards is not a new practice at the local level and that he has very recently employed discards in an experimental phase conducted by himself and his family:

These lands have been agricultural since 1800, but it was only in 1930 that discards [from Arte-Xávega] were used for natural fertilization. I mix the liquids [from the fish box] with horse manure, and I spray it onto living plants [in this case, cauliflowers]. They [the cauliflowers] are [now] strong and healthy. Moreover, they do not develop fungi compared to those not fertilized with discards. The discard liquid must be diluted with four parts water; the smell is very strong, and it is necessary to wear a mask. At the moment, I only use the discard liquids, but in the summer, I plan to make fish meal with dried fish. (Farmer, Costa da Caparica, November 2025)

The self-consumption of certain species has been an alternative explored by this research since the first fieldwork stage in 2024. Although many species are subject to various preconceptions regarding their consumption (see Table 1), local proverbs encourage making the most of the catch: “It fell into the net, it’s a fish [and if it’s a fish, it’s eaten]” (Elderly fisher, Costa da Caparica, February 2024). This local proverb, primarily used by elderly fishers, encourages minimizing discards. Accordingly, part of this research involved recovering several recipes that could be used to prepare some dishes with the discards for future self-consumption. The preliminary outcome was termed by the authors of this study as “second life menu” (research in progress); it has been presented at academic events and is currently being discussed with fishers for further refinement. This menu was developed by drawing on local fishers’ recipes for preparing certain discards. For instance: “With tub gurnard, you cut off the head and the intestines and fry them whole. They are good snacks” (Fisher, Fonte da Telha, September 2024), or “Lesser weever are eaten breaded and fried” (Elderly fisher, Costa da Caparica, May 2024).

Although specific recipes for some species were not registered, certain local practices suggest remnants of past consumption, i.e., it was observed that some fishers picked up live swimming crabs to suck the raw pulp during the fishing process (Partibridges, 2021). Evidence of this practice was further highlighted by a local resident, who collected these organisms to boil and eat them with her family: “I have been doing this for 50 years [eating crabs]. Swimming crabs have no meat in their legs. [We] just suck the body, it tastes like the ‘sea’ and has a bit of food in it” (Resident, Fonte da Telha, September 2025). It should be noted that the aforementioned local resident requested permission from the group of fishers to collect the swimming crabs, to which the wife of the fisher leader replied: “If they are for self-consumption, you do not have to pay for them” (Fisherwoman, Fonte da Telha, September 2025). This reflects a form of local solidarity regarding the use of discards, without seeking economic benefit. However, this does not apply to the commercialization of these crabs as bait for rod fishing in the Tagus River.

In the same direction, some local individuals were observed collecting discards, which may reflect some interest in these abandoned resources. In one case, a woman said she would use the discards (mainly garfish) to feed her turtles at home. In the case of large garfish, this species is occasionally sold on the beach, but only in isolated instances when individuals reach a long length (approximately 1 meter). Some local fishers discard this species due to the appearance of its flesh when raw, warning: “Be careful, that meat is rotten” (Elderly fisher, Costa da Caparica, May 2024). Nevertheless, some fishers of African and Brazilian origin mentioned that in their home countries, garfish is consumed breaded and fried, or simply grilled. Upon verifying its preparation, this research found that the translucent color of the flesh, criticized by some local fishers, turns white when cooked and is as edible as that of other species caught by Arte-Xávega. Regarding golden kelp, no comments were registered concerning its alternative uses. However, some alternative applications for human consumption exist at the national level (see the Rota das Algas Project). Based on the authors’ own experience, this species was used to prepare a roasted vegetable salad and soups, although the need for promotional efforts to encourage its local use is reiterated.

4. Discussion: Towards Blue Justice

The ethnographic findings suggest that the commercialization of discards may progressively generate new forms of vulnerability for Arte-Xávega. Discards become increasingly integrated into external industrial value chains. Consequently, they gradually cease to operate within local systems of self-consumption, informal sharing, and agricultural reuse. This process may reinforce dependency on external buyers and increase exposure to market volatility. It also weakens local autonomy regarding the destination and social use of marine resources. Ultimately, it contributes to the marginalization of territorially integrated alternatives that have historically been linked to the fishing communities themselves.

The previous situation represents a threat to the principles of blue justice (Isaacs et al., 2022), a point that will be discussed below, drawing on injustices already identified (Arias Schreiber et al., 2022). This is exemplified by the case of industrial pillaging, whereby large-scale corporations, i.e., tuna companies, are extracting resources, even discards, from the Arte-Xávega community. In this sense, value chain grabbing means that fish products are transferred from local to regional or even global markets, decreasing local availability. Thus, it is not the community consumption that uses the resource that represents the problem, but rather the commercialization of those resources by larger companies (Longo et al., 2015). This is illustrated by the ACM bought by Spanish companies, where the economic marginalization increased from 70 to 60 euros per fish box. This reflects a

participatory domination and sidelining from governance due to a lack of transparency and the exclusion of fishers from decision-making (Bennett et al., 2021). The auction house's descending logic devalues the catch, with limited fisher participation in determining prices or buyers (Arias Schreiber et al., 2022): "Most local restaurants sell products from other types of fishing, such as industrial fishing. We do not know where ours [from Arte-Xávega] end up, perhaps in Lisbon's markets" (Fisher, Costa da Caparica, August 2025).

Beyond the commercial sphere, regulatory frameworks also generate injustices. The prohibition on leaving discards on the beach (Ministério da Agricultura, do Desenvolvimento Rural e das Pescas, 1996) was ignored in the historical discarding of ACM due to its previous lack of commercial value (Partibridges, 2021), illustrating how regulations do not account for local conditions. Fishers argue it is unfair for responsibility to fall unidirectionally on them without government support (Alvarado & Mesquita, in press). This shows how most restrictions follow top-down dynamics that barely adapt territorially, revealing a form of fisherphobia, since fishers are not considered decision makers (Arias Schreiber et al., 2022): "We have to follow the rules of people [politicians] who have never fished" (Elderly fisher, Costa da Caparica, November 2025). This sidelining from participation operates at the most intimate level, as revealed by a leader of the at-risk group in Costa da Caparica regarding license dependencies that perpetuate structural vulnerability: "I don't have enough money to invest in the [necessary] tractors [for Arte-Xávega]. I have to ask others [fishers] to register hauls at the auction house under my license so it doesn't disappear" (Leader of the at-risk group, Costa da Caparica, October 2025). His testimony reveals how fishers are forced into precarious arrangements to maintain their legal recognition.

Although not a central point of this research, the current prohibition of dolphin capture and consequent consumption (Ministério da Qualidade de Vida – Secretaria de Estado do Ordenamento e Ambiente, 1981) could also illustrate a cultural violation. Local narratives followed a clear ethical principle: "Live animals were released [from the net], even to the point of having to cut the Arte-Xávega net" (Fishing leader, Costa da Caparica, August 2020). Dead dolphins, by contrast, were consumed following local subsistence logics: "It fell into the net, it's a fish and it's eaten." However, this practice has since disappeared, and generational change has played a role: "When I was a child, I was given meat [from Arte-Xávega] to eat that looked different, but upon seeing it, I refused to eat it. Then I realized it was dolphin meat and I never tried to eat it afterwards" (Fisher, Costa da Caparica, October 2025). This exemplifies how regulatory frameworks, alongside generational shifts, can lead to the loss of local cultural practices.

The purchase of ACM for tuna aquaculture doubly threatens the Arte-Xávega community, exposing it simultaneously to industrial pillaging and market volatility. First, it constitutes industrial pillaging by encapsulating artisanal practices into industrial logics (Bennett et al., 2021), threatening the cultural heritage of Arte-Xávega (Silva, 2016). Second, market volatility introduces a structural vulnerability, i.e., if ACM buyers were to decide to end this agreement, discards would return to the beaches. This shows how the responsibility for the management of discards would fall back on the fishers, providing clear evidence of how unstable market forces adversely affect artisanal fishers (Rice et al., 2024), since those marine organisms only represent an object of value if they can be sold (Longo et al., 2015). Beyond industrial pillaging, recreational assault is also evident, revealing how unequal regulatory frameworks favor recreational fishers while penalizing artisanal ones:

Sport [or recreational] fishing is sometimes more profitable, and licenses and permits [for boats] are cheaper, which is unfair. Arte-Xávega needs government subsidies to compensate for what we lose by competing with them [sport and industrial fishers]. If I could sell the catch at the prices I want, I would earn almost double what I earn at the auction house, because there I need to pay taxes. The others [recreational fishers] do not pay taxes. (Fishing leader, Fonte da Telha, July 2025)

In response to these multiple injustices, recovering ancestral practices (Krenak, 2022) offers a concrete pathway towards blue justice and towards sustainable futures. Specifically, this approach includes some strategies to use discards while challenging external market logic (Cohen et al., 2019). An example of the previous could be promoting their traditional use in agriculture (Oliveira et al., 1990) or encouraging their human consumption, i.e., through the second life menu. Beyond these positive initiatives, the threat of misrecognition further endangers the community. Another local fisher warned about the guarantee of the cultural heritage status of Arte-Xávega: “‘Chinchorro’ is like an Arte-Xávega, but smaller. Without its Intangible cultural heritage status, Arte-Xávega would also be prohibited [as the ‘Chinchorro’]” (Fisher, Costa da Caparica, October 2025). This testimony underscores the urgency of bottom-up alternatives that challenge the imposition of regulatory categories and promote local resilience through the collective management of resources and the revitalization of traditional knowledge (Ntona & Schröder, 2020). In this sense, recovering ancestral practices is not merely a nostalgic exercise but a political and ethical strategy to (re)center blue justice on the lived realities, needs, and knowledge of small-scale fishing communities.

5. Final Reflections

The critical ethnographic approach adopted in this research enabled a deep and territorially situated understanding of the discards of Arte-Xávega. This methodology not only facilitated access to internal dynamics but also opened a space for the voices of fishers, revealing their own perceptions of discards. More broadly, certain conditions affecting this community reflect how it experiences a form of systemic discard, which should be taken into account to slow the decline of this fishing art. Furthermore, their narratives evidenced the notable resilience of this community in the face of multiple adversities that threaten blue justice. Added to these challenges are issues related to the management of the auction house, current legal restrictions, and certain difficulties in commercializing catches, including, more recently, discards themselves.

The main contribution of this article to the blue justice literature is demonstrating empirically how the conditional commercialization of discards, ostensibly a sustainable solution, can instead deepen existing vulnerabilities. In response to external pressures, the community has actively sought means of survival, notably through the trade of resources with little or no commercial value, i.e., the ACM and the discards. In this context, promising territorially integrated alternatives are (re)emerging, such as the agricultural use of discards or the creation of menus for their human consumption. Although these alternatives are still in an early stage of development, they represent a potential for collectively envisioning outcomes in the future, especially if their implementation aligns with local interests and needs.

It is important to acknowledge the limitations of this research. The lack of unity and cohesion both within the Arte-Xávega community itself and in its relationship with other key groups, such as farmers, represents a challenge. Additionally, the low selectivity of Arte-Xávega influences the variability in the composition and quantity of the catch and, consequently, the discards, making them highly variable and difficult to quantify

precisely. This variability obstructs any categorical and immutable classification of the catch, which must be understood as a rather dynamic and spontaneous phenomenon.

Based on these reflections, several lines of research are opened for the future. First, it is recommended to explore more deeply the value chain, focusing on the dynamics of the auction house, including its internal and external operations, mainly with first buyers (including Spanish buyers), as well as the distribution of the catches. Second, a more detailed analysis is needed regarding the strategies that each group of fishers employs to manage their catches and, consequently, discards. Third, a deeper study of territorially integrated alternatives is recommended, addressing both technical viability, i.e., the chemical composition of discards as fertilizer, and their potential local acceptance for personal consumption. In this vein, it would be valuable to monitor the reception of these initiatives, i.e., by assessing whether restaurant customers would be interested in some “second life” dishes.

Finally, although this research did not extensively address ethical dimensions beyond an anthropocentric framework, preliminary observations suggest that the variation in value assigned to different captured species, i.e., barrel jellyfish, dolphins, or sole, influences their treatment and care. This finding points toward a potential expansion of blue justice horizons beyond exclusively human concerns, contemplating justice for other forms of life involved in small-scale fisheries. However, this theme requires further empirical development in future research, as the current data do not allow for robust conclusions regarding non-human justice.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

The data are not publicly available due to ethical considerations.

LLMs Disclosure

LLM tools (i.e., DeepSeek) were used for language translation support.

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