



## Small-scale artisanal fisheries and its networks: The case of *Arte Xávega* in Portugal.

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### ABSTRACT

This paper examines the management process of the *Arte Xávega* related to the implementation of the Common Fisheries Policy (CFP) and the Portuguese artisanal fishing regulation. This study looks at a formal normativity and seeks to discern how it is achieved. The methodology is based on the analysis of European and national legal documents collected until 2017 and mobilises a reticular approach, which directs our gaze at the complex interactions guided by contingency and heterogeneity. It is argued that the local governance of the *Arte Xávega* is a highly wide-ranging and diverse process and simultaneously a local and global one through which diverse types of appropriations and translations occur. Throughout this interconnected process between different actors and scales as they seek to implement policies, the different actors' interests are re-represented and re-ordered in the national legislation and norms. Considering this perspective, governance of artisanal fishing is highly contested and unpredictable, shaped by tensions, negotiations, and entangled networks crossing national and transnational scales and perceptions.

### 1. Introduction

Fishing has a long tradition in Portugal and many of its inhabitants have historically relied on this activity as a major means of subsistence. Among other things, this has translated into the country having one of the largest European Exclusive Economic Zones. Small-scale coastal and estuarine fishing have traditionally dominated the exploitation of fishery resources in Portuguese waters [17]. Small-scale coastal fishing in Portugal has represented a permanent alternative to distant fishing. It functions as a buffer for oscillations such as the restructuration of the fleet in 1973/74 [25], and to many coastal communities that still depend almost exclusively on local fisheries and related activities. However, the rarefaction and even disappearance of living marine resources have led the authorities to adopt restrictive measures, rules, norms, and laws to control fishing activity [21]. Also, since Portugal entered into the European Union in 1986, this sector has undergone major changes, leading to the significant decrease both of the vessels and the number of fishermen and landings, as well as to the reduction of this activity's economic importance [1,25]. This decline has been growing since the

adoption of the Common Fisheries Policy of the European Union (CFP) – although other factors have also contributed to this deterioration, such as the progressive ageing of the fishermen population, the activity's low profits, the mechanization of procedures and techniques, and the decrease in the number of participants [5,28].

Small-scale fishing faces diverse challenges and pressures, not the least of which is to establish appropriate governance systems. In the last years, European and national fisheries policies have contributed to the progressive decay of the *Arte Xávega* artisanal fishery in Portugal. This happened through the development of policy instruments and mechanisms of action that often ignores local contexts, profoundly conditioning the continuity of this type of fishery. For example, restructuring and subsidized reduction of the fishing fleet or through the production of restrictive regulatory legislation, forbidding new authorizations or licences to fish and sell. Also, the approaches developed in the CFP are mainly focused on large-scale fisheries and consequently are often inappropriate for small-scale fisheries [11,33]. However, more recently, those regulations have been loosened which may allow *Arte Xávega* to survive. In reality, artisanal fishing in Europe remains socially and

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economically important for the local coastal communities [17,31].

Although some of the academic literature has concentrated on the CFP and its associated restrictive and controlling measures [17,25,30,31,33,6], the contingent and complex nature of its relationship with the national and local level has been neglected. However, it is important to analyse how governance structures may influence the execution and outcomes of policy [10,26]. As David Symes [26] points out.

“The compliance with EU regulations becomes distorted through ‘implementation drift’ whereby political decisions made in Brussels are redefined and alternative political agendas pursued at member state level. As a result, the implementation process may alter the original intention in order to suit local, short-term, distributional concerns” ([26]: 100).

Thus, these European and local processes of policy implementation can be important to understand the interaction between governmental actors, fishermen, experts and associations, as well as the reconfiguration of the national regulation of this artisanal fishing in the broader context of the Common Fisheries Policy (CFP), that’s what this paper is about.

## 2. Methodology

This article uses the case study of the *Arte Xávega* in Portugal to comprehend the management process of small-scale fisheries in relation to the implementation of the Common Fisheries Policy (CFP) and the Portuguese artisanal fishing regulation, through the analysis of European and national legal documents. It explores the relations between policies, actors and networks, highlighting the functional overlapping and the disarticulations and tensions involved. To that end, it adopts a theoretical and methodological reticular approach inspired by the heterogeneous nature of networks, namely the Actor-Network Theory (ANT) and also a document analysis of relevant European and national laws and regulations to map the network of actors involved in the governance of *Arte Xávega*.

### 2.1. Theoretical approach

ANT is a theory of agency, knowledge and organization that considers a web of interactions amongst social actors and non-human entities [3,15]. In the context of resource management studies and debate, ANT perceives “natural resource managers, common property regimes, the economy and technology to be ordered networks of heterogeneous materials that are constantly being shaped and reshaped as new human and non-human entities enter the arena.” ([29]: 19). With all its variations, one would try to understand how, based on the practices of the actors, formal and informal normativities are formed and stabilized, which together (albeit in an agonistic way) produce an object to inquire about.

For ANT, it is through the process of translation that is highlighted and made possible a web of interrelations between different actors, objects, interests, negotiations, adaptations, goals, appropriations, etc., which the articulation process requires [4]. In particular, translation is a process by which a specific problem/issue of an actor-network is made relevant to another actor-network, which implies that the problem is carried by an actor (human or not) from a network to another. In this process, the terms in which a question is asked in one network are changed to make sense in another network – while still making sense in the original network. That is, the ontological characteristics of the performatized object are changed but do not become immeasurable; they are precisely modified to guarantee inter-reticular commensurability. In general, this is done thanks to a mediation work whereby an actor (or an actor-network) moves to the second network, starting to represent the original network and modifying the terms of the problem without perverting them according to the criteria of both networks. In this process,

network analysis provides an explanation of social behaviour based on models of interaction between social actors (human and non-human) instead of studying the independent effects of individual attributes or dual relationships [23]. In this study, the non-human actors analysed are regulations and laws.

In sum, although the legislation and policies contain elements of coercion as a form of regulation, it does not act by itself but instead, “needs to be translated into action, to be made real” ([2]: 74). The recognition that things in themselves do not act can also be affirmed in relation to humans. As John Law points out, “actor-network theory assumes that social structure is not a noun but a verb. The structure is not free-standing, like scaffolding on a building-site, but a site of struggle, a relational effect that recursively generates and reproduces itself” ([16]: 386).

### 2.2. Research methods

In order to map the network of actors involved in the managing of *Arte Xávega*, the paper analyses relevant legal documents aiming to go beyond the simple mapping/identification of actors to explore how they act and in which domains/areas. A computerised legal search was conducted on the Portuguese official database that collects and publishes all legislation and jurisdictional acts and any acts of an administrative nature, jurisdictional documents and public and private contracts: The Official Journal (Diário da República). The research strategy focused on the regulation concerning small-scale fisheries and *Arte Xávega* and the implementation of the CFP. Thus, the legal research used a combination of the following terms “arte xávega”, “pesca por arte de arrasto”, “pesca por arte envolvente-arrastante”, “pesca artesanal” and “política comum das pescas”. The legal documents were gathered through online research, and legal cross-referencing.

Initially, the authors screened the results and identified the relevant laws and regulations. The main exclusion criteria applied was the focus of the law or regulation (e.g. Portaria n.º 99/78 - Determines the postal value and entry into circulation of a new series of stamps-, that included the figure of a *xávega* vessel was excluded). Following this phase, the remaining documents were examined in-depth, and an additional electronic survey was carried out based on the cross-referencing of sources.

Finally, the authors identified the legal documents currently in force and a set of three main indicators were developed and used for the comparative analysis of the actors’ type, functions and domain/area of intervention (Table 1). For that purpose, information was also obtained from the official sites and documentation available online and from

**Table 1**  
Indicators and Categories developed to access and compare actors’ type, functions and domain/area of intervention.

Questions	Indicators	Categories
Who	Actors	Central state Local state Monitoring commission: Private sector ONG Experts/academics Fishermen Buyers Business associations
How	Functions	Regulatory Executive Licensing Surveillance/control Consulting Observing
Which	Dimension/area	Marine resources Capture and commercialization Common fisheries policy National legislation Licence and documentation

contacts with key informants in the institutions relevant for the study, namely in IPMA and Monitoring Commission.

The paper presents the main results of our research by offering an analysis of the network of actors involved in the process of management of *Arte Xávega* considering the process of translation of the CFP into national legislation on traditional fishing and its implementation. The following discussion attempts to answer three basic questions: who, how, and in which domain the governance process of *Arte Xávega* is managed upon a complex web of relations between CFP, National Policy on traditional fishing and several local agents and interests.

### 3. Results and discussion

#### 3.1. Common fisheries policy and small-scale fishery

The first set of EU (then EEC) regulations on fishing adopted in 1970 were mainly concerned with measures directed at structural and economic issues. But the first Basic Regulation (Council Regulation (EEC) No 170/83)<sup>2</sup> establishing a common fisheries management system was only adopted in 1983, after several years of negotiations. Since this first Basic Regulation, the primary management framework has been subjected to revision every ten years [24].

The Common Fisheries Policy (CFP) is a European policy that deals with the “management of fisheries, aimed at protecting the marine environment, enhancing the sustainability of fish stocks, and the economic competitiveness of the fishing industry” ([13]: 1). But owing to the fact of “neither the living aquatic resources nor the profits of the fishing industry have benefited from it, with 88% of the stocks being overfished and profit margins of fishermen continuously in decline” ([13]: 1), a new reform process of the CFP was initiated by a Green Paper published in 2009 by the European Commission [7]. It would culminate in October 2013 with an agreement on a new Basic Regulation between the European Commission, the European Council and the European Parliament.

The new fisheries regime is based on three main regulations: the new CFP (Regulation (EU) No 1380/2013)<sup>3</sup>; the common organisation of the fishery and aquaculture products markets (Regulation (EU) No 1379/2013)<sup>4</sup>; and the new European Maritime and Fisheries Fund (EMFF) (Regulation (EU) No 508/2014)<sup>5</sup> [19]. Those new obligations require that the EU must guarantee the maximum sustainable yield, a better-controlled landing obligation for bycatch and an increased decentralised governance to assist the decision making at regional and local levels [24]. Also, it is asked to the Member States to “reinforce the role of science in the future CFP by increasing data collection and information sharing on stocks, fleets and the local socio-environmental impact of fishing activities” ([19]: 4). Furthermore, it established that Member States should seek to give preferential access to small-scale fishing (SSF), artisanal or coastal fisheries, “given its low environmental impact and the high degree of labour involved” ([19]: 4). Thus, the reformed CFP includes several measures to support SSF, “namely the potential exemption from transferable fishing concessions schemes, and additional operational programs for the development and increased sustainability of the SSF segment” ([31]: 65). Nonetheless, some authors

<sup>2</sup> <https://op.europa.eu/en/publication-detail/-/publication/51b5a2ea-875f-41ca-afef-129d557a32af/language-en> (21 July 2020)

<sup>3</sup> <https://op.europa.eu/en/publication-detail/-/publication/127ceea5-76cc-11e3-b889-01aa75ed71a1/language-en/format-PDF/source-140418491> (21 July 2020)

<sup>4</sup> <https://op.europa.eu/en/publication-detail/-/publication/576caa84-76c9-11e3-b889-01aa75ed71a1/language-en/format-PDF/source-140418629> (21 July 2020)

<sup>5</sup> <https://op.europa.eu/en/publication-detail/-/publication/98f12f35-36a8-4a37-89ef-9b9314ef2605/language-en/format-PDF/source-140418413> (21 July 2020)

consider that some of the measures pose more problems than solutions [31,33].

As noted by Veiga et al. [31], “SSF fleets are by far the most important fishing segment in terms of numbers of vessels and fishers employed” ([31]: 65). Despite of their comparatively low volume of catches and economic importance, SSFs are socially, economically, and culturally important for local communities [11,31]. They contribute to the creation and maintenance of employment in vulnerable regions; promote the social, environmental and economic well-being and health of coastal communities and guarantee high-quality fresh fishery products to the EU market [31]. Furthermore, “they reinforce the attachment people feel for their territory, enhancing social stability in rural and peripheral areas” ([11]: 2).

However, when compared to large-scale industrial fisheries European small-scale fisheries have been generally neglected by the national and international scientific community and policy makers [11,31,33]. As suggested by Garcia et al. [8], “this neglect arises, at least in part, from an under-estimation and consequent under-appreciation of the economic value and contribution of SSF to broader societal well-being” ([8]: ix).

#### 3.2. Small-scale fisheries regulation in Portugal: the case of *Arte Xávega*

*Arte Xávega* is an ancient beach seine fishery traditionally carried out along the Portuguese coastline by small fishing communities, with reports dating as far back as the early fifteenth century [20,28]. This beach seine fishery uses seine nets with a bag controlled from the shore. The gear is composed of a bunt (bag) and long wings often lengthened with long ropes for towing the seine to the beach, retaining the fish in the bag. It is maneuvered with the help of animals or mechanical equipment, such as cattle or tractors. The headrope and floats rest on the surface and the footrope is in permanent contact with the bottom, allowing the seine to function as a barrier that prevents the fish from escaping from the area enclosed by the net. The fishing fleet used for *Arte Xávega* is comprised mainly of small vessels, on average: 7,8 m in length (and usually under 12 m), 3 GT in displacement, and 19 years old [20], corresponding to EU’s definition of small-scale fisheries.<sup>6</sup> In the period 1996–2012, captures of *Arte Xávega* varied between 463t and 2195t per year and registered a minimum value in 1996 of 647 thousand euros and a maximum value in 2010 of 1922 thousand euros [20].

This artisanal beach seine fishery is carried out near the coast, in areas considered sensitive because they are nursery habitats, areas of reproduction and/or of growth of many species with high economic interest [1]. Although the species composition of the captures fluctuates along the coast and seasons, the main species captured usually are horse mackerel, mackerel, European anchovy, sardine and squid [20]. Furthermore, it is characterized by a non-selective gear through significant catch and discards, and by a great proportion of juveniles in catches that do not have the legal minimum size allowed by law for commercialization [12]. According to Martins et al. [20], the existing quantitative data indicate that about 60% of the catches are unloaded and sold on the fish resale market, 20% is sold on the beach and 12% is discarded.

In the last years, the ethnographic, cultural and historical value of *Arte Xávega* has been progressively recognized, as well as its importance to the identification of coastal fishing communities, resulting in multiple ethnographic publications on the subject (e.g. [27]), the creation of museums (e.g. Praia de Mira Ethnographic Museum) and associated touristic events. Also, the *Arte Xávega* was recently registered “in the National Archive of Intangible Cultural Heritage (e.g. Costa da Caparica

<sup>6</sup> Precisely, a “small-scale coastal fishing” which includes fishing activities carried out by fishing vessels of an overall length of less than 12 m and not using towed fishing gear, as indicated in point 14 of article 3 of the Regulation No 508/2014.

beach seine fishery; announcement 14/2017 in DR 34/2017, series II)" ([22]: 299). Interestingly, this process of patrimonialization of *Arte Xávega* and its extension into a touristic attraction (mainly promoted by local institutions) contrasts with the decline of this activity and the limitations imposed by the tourism activity [9]. Although its ethnographic value and tourist interest are increasingly recognized, allowing more advantageous fish sales, this beach seine fishery and its national legislation have been conditioned by tourism activity [22]. That is, *Arte Xávega* "can only operate in very restrictive locations and is not allowed during the beach season in concession areas between 10.30 am and 6.30 pm in order not to interfere with tourism" (p. 299).

Although *Arte Xávega* is considered an ecologically sustainable fishing method [32], all these factors, along with the CFP's objective of conserving fish stocks and protecting the marine ecosystem, contributed to the Fisheries Regulation with the *Arte Xávega* (Regulamento da Pesca com a Arte de Xávega - Portaria 488/96, de 13 de Setembro de 1996),<sup>7</sup> in 1996. This law established strict rules concerning the size of the *arte* (fishing net), the area and the period of operation during the summer season, and limited the expansion of *Arte Xávega*, prohibiting the granting of new licences and/or the acquisition of new vessels. Currently, *Arte Xávega* was regulated by the Fishing by Surrounding/-Trawls Regulation (Regulamento da Pesca por Arte Envolvente-Arrastante - Portaria 1102-F/2000 de 22 de Novembro),<sup>8</sup> which practically have not changed the previous norms. Nevertheless, given the signs of ageing of the licensed vessels, which raised safety issues, the Portaria 244/2005<sup>9</sup> allowed their replacement, maintaining the proviso that this is "a fishery that is not intended to develop". In 2013, Portaria 4/2013 de 7 de janeiro<sup>10</sup> stated that the knowledge acquired in the meantime on the conditions in which *Arte Xávega* is developed advises the alteration of the respective legal regime, creating the Monitoring Commission of Fishing with *Arte Xávega*. In fact, according to Guyader et al. [11], "the main problem regarding the management of SSFs is that the complexity of the sector and the lack of systematic studies lead to the formulation of assumptions rather than to the presentation of the intangible elements that define the sector's profile at EU level ([11]: 3).

Consonant to the work of this Commission, the composition of *Arte Xávega*'s catches and the variability that they present (according to the time of year and with the area in which they occur) pointed to the inevitability of specimens below the minimum size of discharge captured. This led the Commission to advise flexibility in the application of the rules that are in place for this activity, without prejudice to the desired improvement of the selectivity of the fishing. Furthermore, article 7 of the Fishing by Surrounding and Trawls Regulation (Regulamento da Pesca por Arte Envolvente-Arrastante - Portaria 1102-F/2000 de 22 de Novembro) already established the interruption of fishing activity when the captures have a high percentage of specimens that do not fulfil the minimum size of conservation reference [20].

The Commission Delegated Regulation (EU) 2016/2377 of 14 October 2016 amended the Delegated Regulation (EU) No 1394/2014<sup>11</sup> establishing a discard plan for certain pelagic fisheries in South-Western waters. Namely, in the Article 1 of Regulation (EU) 2016/2377 the following paragraph is added to the Delegated Regulation (EU) No 1394/2014, Article 4:

<sup>7</sup> <https://data.dre.pt/eli/port/488/1996/09/13/p/dre/pt/html> (21 July 2020)

<sup>8</sup> <https://data.dre.pt/eli/port/1102-f/2000/11/22/p/dre/pt/html> (21 July 2020)

<sup>9</sup> <https://data.dre.pt/eli/av/244/2005/05/27/p/dre/pt/html> (21 July 2020)

<sup>10</sup> <https://data.dre.pt/eli/decl/4/2013/06/24/p/dre/pt/html> (21 July 2020)

<sup>11</sup> <https://op.europa.eu/en/publication-detail/-/publication/eff7bcb0-8ff4-11e4-b8a5-01aa75ed71a1/language-en/format-PDF/source-140418671> (21 July 2020)

"By way of derogation from Annex XII to Regulation (EC) No 850/98, the minimum conservation reference size for horse mackerel (*Trachurus* spp.) caught in ICES division VIIIc and ICES subarea IX shall be 12 cm for 5% of the respective quotas of Spain and Portugal in those areas. Within that limit of 5%, in the *xávega* artisanal beach seine fishery in ICES division IXa 1% of the quota of Portugal may be caught with the size below 12 cm."<sup>12</sup>

After this derogation, the latest regulation on *Arte Xávega* (Portaria 172/2017 de 25 de maio) argues that it is necessary to "keep track of the fishery and gather information to assess the adequacy of the measures in force and justify the existing derogation regime".<sup>13</sup> It renewed the Monitoring Commission according to the Common Fisheries Policy orientation to promote more decentralised governance. It states that "the compulsory installation in the networks with acoustic devices of deterrence" given "the impacts on the by-catch of protected species of cetaceans", as the boto and bottlenose dolphin.

The entry of Portugal into the European Economic Community, currently the European Union (EU), and the consequent adoption of the CFP and national legislation reforms contributed to the progressive decline of *Arte Xávega* and of the number of vessels licensed to practice it (Fig. 1). The largest drop was recorded precisely after the 1996 law that introduced strict norms and forbade new authorizations or licences with measures of restructuring and subsidized decommissioning of the fishing fleet and production of regulatory legislation [25]. In 2017, there were 41 small fishing vessels of *Arte Xávega* operating in the Portuguese coast. However, Souto [28] argues that the decrease of this fishery began in the decade of 1960/70 probably due to lack of manpower (i. e. recruitment for the Portuguese Colonial War in Africa, emigration, work in industrial fishing vessels). Furthermore, other factors, such as the fishermen's ageing, seasonality and low profits must be considered to understand this decline [5], as well as the increasing opportunities for employment elsewhere in the local/regional economies', namely in the beach tourism sector.

### 3.3. The network of *Arte Xávega*

Fisheries are a common policy, with common rules adopted at EU level and applied in all Member States. However, while EU legislators define the general framework, each Member State defines and develops the implementing measures. As mentioned above, the meanings and perceptions regarding *Arte Xávega* were gradually reformulated and translated into norms and rules through processes of collective action. In addition to the state institutional network directly involved in the regulation of the fisheries sector, it is important to consider other human actors, such as the fishing community, specialists and scientists (biologists, environmental engineers, etc.), and non-human actors, such as the common fisheries policy, national legislation, means of capture, means of marketing, marine resources considerations. These interactions are decisive for the process of implementation and translation of the CFP into national legislation and can lead to processes of transformation through restrictive legislation aimed at protecting marine resources, and others allowing a derogation that considers the availability of fish stocks and the craftsmanship of the means of capture.

The network of *Arte Xávega* is deeply dense in the interaction between human and non-human actors, being, comparatively, the interaction between human actors relatively reduced and centred on the bodies of the Ministry of the Sea (Fig. 2).

The actors' network of *Arte Xávega* is mainly state-centred, with

<sup>12</sup> <https://op.europa.eu/en/publication-detail/-/publication/6763e01d-c8a0-11e6-a6db-01aa75ed71a1/language-en/format-PDF/source-140418644> (21 July 2020)

<sup>13</sup> <https://data.dre.pt/eli/port/172/2017/05/25/p/dre/pt/html> (21 July 2020)

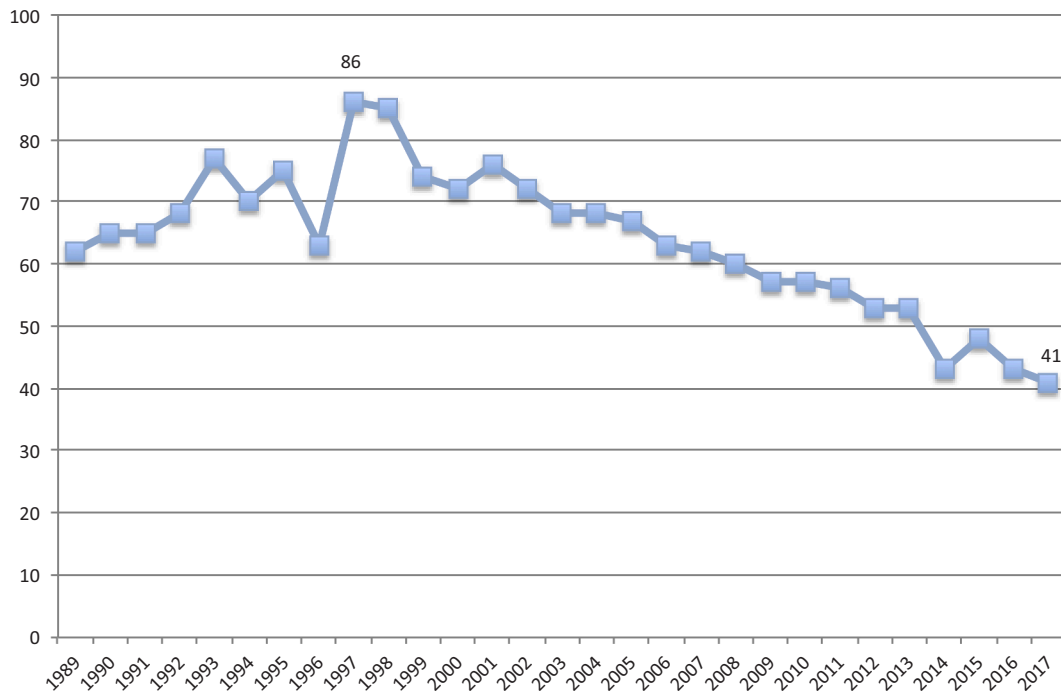


Fig. 1. Number of licensed vessels for Arte Xávega from 1989 to 2017.

Source: DGPA - Directorate-General for Fisheries and Aquaculture (from 1989 to 2012) and DGRM (Directorate-General for Natural Resources, Safety and Maritime Services) (from 2013 to 2017)

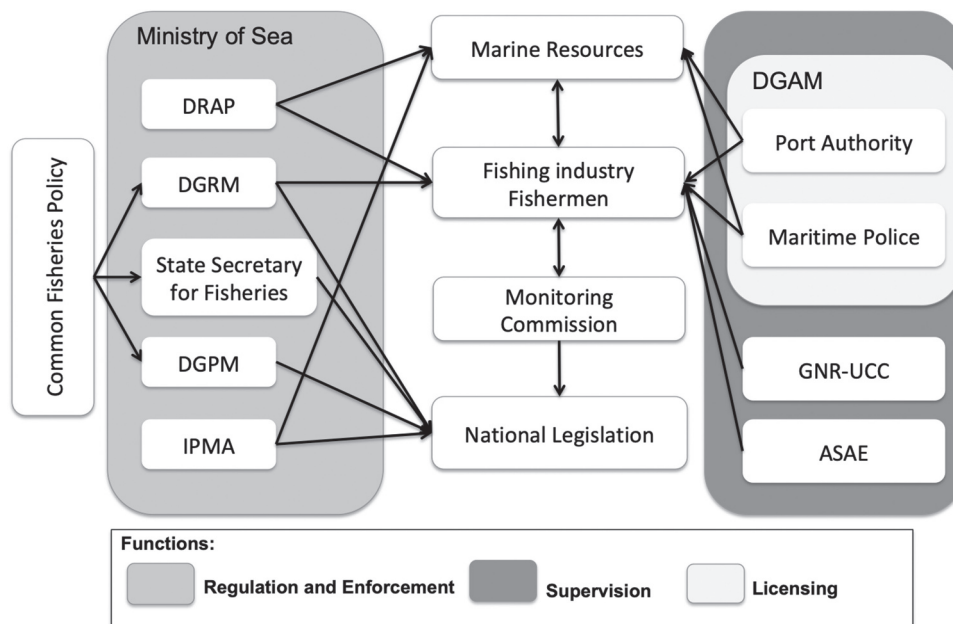


Fig. 2. Network of human and non-human actors of the Arte Xávega.<sup>141</sup>

interconnections that are remarkably scarce: for 17 actors (stakeholders) there are only 13 links (considering the linkages established within the Monitoring Commission as just one). Governmental institutions contacted in the course of this survey mainly compose the network and its links/connections are aimed at the Ministry of the Sea, which leads the majority of state institutions involved in fisheries' governance. The

Ministry of the Sea is responsible for, among other services, the Directorate-General for Marine Policy (DGPM), the Directorate-General for Natural Resources, Safety and Maritime Services (DGRM)<sup>15</sup> and the Portuguese Institute of the Sea and Atmosphere (IPMA), a research institute that supports policies decision. Two of the few linkages established outside the Ministry of the Sea are those between Directorate-

<sup>15</sup> These services are responsible for the design of policies and regulations and the protection of resources and bureaucratic aspects of access to the activity.

General for Natural Resources, Safety and Maritime Services (DGRM), GNR-UCC and Maritime Police within the national Monitoring and Control and Surveillance System of Fisheries (SIFICAP), and those established within the Monitoring Commission. Note that one of the institutions with supervisory and control functions in this area, ASAE (Food and Economic Security Authority), work isolated from the other institutions. This situation hinders the exchange of information and raises the risks of controversy and functional overlap. In a system where actors have few opportunities to communicate, the capacity of reaction and adaptability is reduced [14].

Until the creation of the Monitoring Commission of Fishing with *Arte Xávega*, in 2013, the regulation of fishery/*Arte Xávega* was exclusively (central) state-oriented and the linkages with other actors were even more limited than they are today. The monitoring commission is still coordinated by DGRM (Directorate-General for Natural Resources, Safety and Maritime Services) and includes other governmental and state institutions, such as State Secretary for Fisheries, GNR-UCC (Republican National Guard - Coastal Control Unit), DGAM (Directorate-General for Marine Authority), IPMA (Portuguese Institute for the Ocean and Atmosphere), but has also representatives of local municipalities, private sector (e.g. DOCA Pesca) and non-governmental institutions (such as PONG-Pesca – Platform of Portuguese NGOs on Fisheries), as well as representatives of fishermen and buyers (Table 2). Other institutions also participate as observers (guests): CEMAR – Center for Marine Studies, ISCTE - University Institute of Lisbon, Oceanography Institute of the Faculty of Sciences of Lisbon, and Almada, Mira and Sesimbra municipalities. Nevertheless, the majority of the institutions are still state-owned.

The latest regulation (Portaria 172/2017, 25th May) recognized the importance of this Commission, establishing a participatory regime for the management and monitoring of the fishery with *xávega*. This regulation also altered the Commission Composition (Table 2), increasing the participation of local state (3 Parishes) and fishermen's represen-

**Table 2**  
Monitoring Commission composition, 2013 and 2017.

Institutions/Actors	Portaria n.º 4/2013 7th January	Portaria n.º 172/ 2017 25th May
<b>Central State</b>	<b>6</b>	<b>6</b>
State Secretary for Fishery	1	0
GNR-UCC	1	1
DGAM	1	1
IPMA	1	2
DGRM	2	2
<b>Local State</b>	<b>2</b>	<b>6</b>
Municipalities	2	3
Parishes	0	3
<b>Private Sector</b>	<b>2</b>	<b>2</b>
DOCAPESEA, SA	1	1
Representatives of buyers	1	1
<b>ONG</b>	<b>2</b>	<b>3</b>
League of Nature Protection (Association)	1	0
PONG-Pesca	0	1
Xávega Association	0	1
Federation of Fisheries Trade Unions	1	1
<b>Fishing Community</b> (Representatives of fishermen)	<b>3</b>	<b>3</b>

<sup>14</sup> Acronyms: DGPM (Directorate-General for Marine Policy); DRAP (Regional Directorates for Agriculture and Fisheries); ASAE (Food and Economic Security Authority); GNR-UCC (Republican National Guard - Coastal Control Unit); DGAM (Directorate-General for Marine Authority); IPMA (Portuguese Institute of the Sea and Atmosphere); DGRM (Directorate-General for Natural Resources, Safety and Maritime Services)

tatives (including 1 representative from the *Xávega* Association). Following previous regulations, this one also foresees the participation (by invitation) both of representatives of other entities that have a legitimate interest in the monitoring of fishing using wrapping art and of personalities of recognized scientific merit. The creation of this Monitoring Commission of Fishing with *Arte Xávega* is part of the change in the governance interactions in recent years, with fishing organizations being “increasingly called to participate in the decision-making process”, although “based on a consultative approach and therefore with limited influence” ([22]: 298), where the adequacy of the proposed measures will be evaluated and adapted if needed. Furthermore, the huge imbalance in the *Arte Xávega* network between Central State and the fishing community prevails.

According to Lacroix and Simard [14], “the early involvement of stakeholders [...] and the careful management of all actors with a long-term view clearly reduce the risk of misunderstanding, controversy and opposition” ([14]: 6).

The ANT approach gives a useful and practical tool to understand the importance of a more decentralized governance, promoted in the new CFP, and the creation and maintenance of the Monitoring Committee nationally. It is crucial to bring the decision procedure closer to the fishing grounds as well as the difficulties that had to emerge in the implementation of the CFP, at least nationally, given that the majority of the actors/stakeholders are excluded from the small-scale fisheries regulation as well as from its definition and implementation processes.

The type of functions that each actor/stakeholder performs (Table 3), organized in regulatory, executive, licencing, supervisory, consulting and observer, shows the polyvalence of the DGRM, the quantity and heterogeneity of institutions with supervisory functions (in many cases indicating a functional overlapping among these elements) and the limited participation of experts in the artisanal fisheries governance, contrary to the latest CPF instructions and recommendations.

The Directorate-General for Natural Resources, Safety and Maritime Services (DGRM) is responsible for the implementation of policies for the preservation and knowledge of marine natural resources, the implementation of fisheries aquaculture, manufacturing and related activities policies (executive), safety development and maritime services, including the maritime-port sector. It is in charge also of ensuring the regulation, inspection, monitoring, coordination and control of the activities carried out under those policies (licensing and control). Also, it coordinates the Monitoring Commission. None of the other governmental institutions has such a range of functions.

The growing concern about the overexploitation of marine resources and the ineffectiveness of previous policies and control systems [19] are some of the possible explanations for overlapping supervisory functions. The four institutions (Port Authority, Maritime Police, GNR-UCC and ASAE) with supervisory functions have very similar abilities:

- Port Authority - Check the existence of ships' certification documents and other shipboard papers and compliance with the rules of the/ each port, sanitation, customs, taxation and police authorities;
- Maritime Police - Supervise the compliance with legal regimes applicable to fisheries matters, enacting the precautionary measures that are defined by the Port Captain;
- GNR-UCC (Republican National Guard - Coastal Control Unit), - Participate in the surveillance of the activities of capture, landing, culture and commercialization of marine species, in conjunction with the National Maritime Authority;
- ASAE (Food and Economic Security Authority) - supervise establishments handling fishery products, including aquaculture, factory ships, vessels, auctions, warehouses and wholesale markets; supervise the commercialization of products and services under the terms legally established to ensure the health and safety of consumers, as well as supervising the fulfilment of the legal obligations of economic agents.

**Table 3**  
Institutions' functions in fishery governance.

Institutions/Actors	Regulatory	Executive	Licensing	Supervisory	Monitoring (Commission) <sup>a</sup>
Ministry of the Sea	X				
State Secretary for Fishery	X				X
DGPM	X	X			
DGRM		X	X	X	X (coordination)
IPMA	X (support)	X (support)			X
DRAP		X	X		
Port Authorities			X	X	
Maritime Police				X	
GNR - UCC				X	X
ASAE				X	
DGAM					X
Espinho Municipality					X
Marinha Grande Municipality					X
DOCAPESCA, SA					X
League of Nature Protection (Association)					X
Federation of Fisheries Trade Unions					X
Representatives of fishermen					X
Representative of buyers					X
University of Coimbra - CEF					X

<sup>a</sup> The Monitoring Commission includes other institutions that act exclusively in a consultative role (as observers), namely CEMAR, ISCTE, Oceanography Institute of the Faculty of Sciences of Lisbon, PONG-Pesca– Platform of Portuguese NGOs on Fisheries, Almada municipality, Mira municipality and Sesimbra municipality.

The participation of the experts in policy definition and implementation is very limited; they only take part of the Monitoring Commission as observers. However, the Commission considered it relevant to deepen the knowledge about the composition of the catches of *Arte Xávega* and the variability that these present as a function of the time of the year and area where they occur [20]. In this context, and due to Administrative Rule no. 104/2015, of April 9, the Portuguese Institute for the Ocean and Atmosphere (IPMA) was delegated to carry out a study in 2015 on the activity of *Arte Xávega*. This study aimed to evaluate its impact on the stocks of the species captured in this kind of fishing, identifying the proportion of undersized specimens caught. In this study, the IPMA, in partnership with the University of Coimbra, collaborated at the harvest of 2015 (between April and November), involving all 49 vessels licensed for fishing with *Arte Xávega* in that year. This study provided a huge amount of data and contributed to the above-mentioned derogation, stressing the importance of the unusual partnership between scientists and fishermen, and the participation of the fishing communities. Nevertheless, and although the new CFP introduces new obligations that require the Member States to reinforce the role of science, the new Commission still doesn't foresee the participation of experts.

#### 4. Conclusions

This paper analysed the management process of the *Arte Xávega* related to the implementation of the Common Fisheries Policy and the Portuguese artisanal fishing regulation as a heterogeneous and hybrid process resulting from the interaction between human and non-human actors. The concepts of heterogeneous, hybrid network and translation have proven to be a valuable contribution to the analysis of the application of the CFP to the regulation of *Arte Xávega*. Over time, the meanings and perceptions regarding *Arte Xávega* have been reformulated through the process of collective action, governmental institutions and experts. It is this process of translation that highlighted the interaction between the interests and objectives of state organizations, fishing communities and experts.

The concepts of heterogeneous network and translation proposed by ANT are a valuable contribution to the analysis of the national and local implementation of the public policies. Also, in analysing the association between the implementation of the CFP and the regulation and monitoring of *Arte Xávega* it is necessary to consider the possibility of a network be constituted by different or even conflicting and incompatible interests and agendas, just because the fact that “belonging to an

interinstitutional network is distinct from belonging to each one of several communities of practice involved in this network” ([18]: 276). Moreover, it is interesting to note that the overlapping functions of the various agents can be analysed also as a form of interrelation operationalized through the idea of a network. Thus, the number of connections identified in this paper is increased through indirect links between network elements (A and B perform the same function without formally and directly dialoguing, but the fact that both are aimed at the same target – C – creates a type of bond between A and B).

Finally, even though it can be concluded that there is little evidence of CFP involvement in the *Arte Xávega* management system the creation of the Monitoring Commission of Fishing with *Arte Xávega* is inevitably related to the new European fisheries regime (CFP Regulation, EU, N. 1380/2013) that required an increased decentralised governance to assist the decision making at regional and local levels. Furthermore, this paper suggests that institutional frameworks and policy discourses can be better understood through a reticular analysis. It means that is important to analyse the entangled nature of networks crossing global and local scales and diversity of agents that reveal specific practices of appropriation and translation of national and transnational policies. Therefore, this approach can contribute to the valorisation and visibilisation of national and regional needs and perceptions, sustainable economies and natural endogenous resources, that in turn can boost the democratic participation in more effective processes of governance.

However, the current analyses present two key limitations. First, more research is required on the articulation and content of the interactions within the network to fully understand its functioning. Therefore, future studies should include other methodology approaches, namely interviews and participatory methodologies as workshops and focus groups, to assess the functioning of the network in terms of frequency, direction and mode of connection between the actors and the content of the transactions. Secondly, the focus on the Common Fisheries Policy precludes a comprehensive and systematic analysis of other factors that influenced *Arte Xávega* regulation, such as the rise of the tourism sector in the Portuguese beaches, and the policies of cultural heritage safeguarding. This analysis undertook, nevertheless, a useful and rare opportunity to understand the governance of small-scale fisheries in Europe through the case study of a Portuguese traditional fishery.

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### CRedit authorship contribution statement

**Fátima Alves:** Conceptualization, Writing - original draft, Writing - review & editing, Supervision; **Paula Casaleiro:** Conceptualization, Investigation, Data curation, Methodology, Formal analysis, Writing - original draft. **Cristina Sá Valentim:** Writing - review & editing; **Paula Castro:** Technical management, Supervision; **Miguel Pardal:** Funding acquisition, Project administration.

### Declarations of interest statement

None.

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