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In the same storm but not in the same boat. A case study of scalar politics in the Joal-Fadiouth marine protected area, Senegal

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Declaration

I, Louis Pille-Schneider, declare that this thesis is a result of my research and findings. Sources of information other than my own have been sited and a reference list has been appended. This work has not previously been submitted to any other university for award of any type of academic degree.

Date……16/08/2021……

Signature……Louis Pille-Schneider……

Dedication

I dedicate this thesis to the artisanal fisherfolk in Joal-Fadiouth, Senegal.

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Abstract

Marine protected areas (MPAs) constitute today the favored tool for fisheries management and marine and coastal conservation around the globe. In practice, the establishment of MPAs is however not free from impacts on the coastal communities that rely on the ocean and its resources for their livelihoods and wellbeing. This is particularly so in developing countries, where communities living at sites where MPAs are increasingly being established tend to have low incomes that render them vulnerable to imposed constraints on their rights to access and exploit the resources they depend on.

Senegal strongly relies on fisheries for its national economy, food security, and cultural continuity. However, overexploitation and the long-warned decline of fish stocks, and the long-lived competition and contention over marine space and resources between the artisanal and industrial subsectors has since the 1990s led Senegalese artisanal fisheries into a social-ecological crisis. With the aim of curbing this crisis, MPAs have since the mid-2000s constituted, the favored strategy for managing fisheries.

Employing a political ecology lens this study was conducted with the twofold objective to, first, examine the local implementation of the Joal-Fadiouth MPA as a fisheries management intervention and its consequences for artisanal fishers, and second, to situate this intervention within the broader political economic seascape, with the aim to unveiling why the local scale, inherent to the Joal-Fadiouth MPA, remains the one favored for addressing overfishing and marine resource degradation in Senegalese waters.

Adopting a case study design and qualitative research methods, this research was conducted through semi-structured interviews among the fisherfolk community of Joal-Fadiouth, as well as with multiple representatives from local and national institutions, and through photovoice focus groups with fishers.

I have found the JFMPA to constitute an expression of scalar politics, whereby the local scale is the one being operationalized for fisheries management and addressing overfishing and the degradation of marine resources in Senegalese, as a means to allow the State for accumulating from both conservation and extractive zones concurrently, at the expanse of artisanal fishers.

Table of contents

List of figures

List of tables

Acronyms

ADEPA	West African Association for the Development of Artisanal Fisheries (*Association Ouest Africaine pour le Développement de la Pêche Artisanale*)
AFD	French Development Agency (*Agence française de développement*)
APRAPAM	Association for the Promotion and Empowerment of the Artisanal Maritime Fisheries Actors (*Association pour la promotion et la responsabilisation des acteurs de la pêche artisanale maritime*)
CAOPA	African Confederation of Artisanal Fisheries Organizations (*Confédération Africaine des Organisations de Pêche Artisanale*)
CBD	Convention on Biological Diversity
CRODT	Oceanographic Research Center of Dakar-Thiaroye (*Centre de Recherches Océanographiques de Dakar-Thiaroye*)
DAMCP	Directorate for Community-based Marine Protected Areas (*Direction des Aires Marines Communautaires Protégées*)
DPN	Directorate for National Parks (*Direction des Parcs Nationaux*)
DPM	Directorate for Marine Fisheries (*Direction des Pêches Maritimes*)
DPSP	Department of Fisheries Surveillance and Protection (*Direction de la Protection et de la Surveillance des Pêches*)
EEZ	Exclusive Economic Zone
EU	European Union
FCFA	CFA franc
GAIPES	Senegalese organization of shipowners and industrial marine fisheries (*Groupement des armateurs et industriels de la pêche du Sénégal*)
GDP	Gross Domestic Product
IUCN	International Union for Conservation of Nature
IRD	Development Research Institute (*Institut de Recherche pour le Développement*)
JFMPA	Joal-Fadiouth marine protected area
JICA	Japan International Cooperation Agency
MEDD	Ministry of Environment and Sustainable Development (*Ministère de l'Environnement et du Développement Durable*)
MPA	Marine protected area
MPEM	Ministry of Fisheries and Maritime Economy (*Ministère des Pêches et de l'Économie Maritime*)
NGO	Non-governmental organization
NSD	Norwegian Centre for Research Data *(Norsk Senter for Forskningsdata)*
RAMPAO	Regional Network of Marine Protected Areas in West Africa (*Réseau régional d'Aires Marines Protégées en Afrique de l'Ouest*)
PAPAS	Platform for Artisanal Fisheries Actors in Senegal (*Plateforme des Acteurs de la Pêche Artisanale au Sénégal*)
ZPP	Protected Fishing Zone (*Zone de pêche protégée*)
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Program
WWF	World Wildlife Fund

1. Introduction

1.1. Introduction

Nearly 15 years ago, Jentoft et al. (2007) coined the global and widespread implementation of marine protected areas (MPA) "the MPA pandemic" (:620). While this phrasing seems in the current COVID-19 pandemic moment sadly ironic, it remains nonetheless much pertinent, in light of the pace at which MPAs continue being implemented worldwide (UNEP-WCMC, 2018), in commitment particularly to international areal biodiversity conservation targets (CBD, 2010a; CBD, 2010b). Attracting a broad range of actors around their multiple purposes (Gray et al., 2014), MPAs constitute today the favored tool for fisheries management and marine and coastal conservation around the globe (Gaines et al., 2010; Gray, 2010; Rice et al., 2012; Berkes, 2015), not least in developing countries (Bryceson et al., 2014; Chmara-Huff, 2014).

As a means to promoting their adoption across stakeholder groups and to increasing their acceptance by rightsholder groups, coastal MPAs particularly, are often implemented with a view to addressing multiple objectives of biodiversity conservation, fisheries management, and socioeconomic development altogether (see e.g. Diouf & Sané, 2020), and advocated for using the prevalent multiple-wins public discourse (Brown, 2004; Chaigneau & Brown, 2016). Yet, while abundant evidence points to the ecological benefits – an anthropocentric and value-laden concept (Caveen et al., 2013), of MPAs for biodiversity conservation (Halpern, 2003; Lester et al., 2009), the benefits of MPAs for fisheries management remain controversial (Gell & Roberts, 2003; Sale et al., 2005; Kolding, 2014). As for the human benefits, these are commonly described in general terms only, merely as anticipated secondary effects (Jentoft et al., 2007).

In practice, the establishment of MPAs is not free from impacts on the coastal communities that rely on the ocean for livelihoods, subsistence, wellbeing, and cultural continuity (Bennett, 2019b:1). Restricting access to their marine and coastal environment and natural resources by a "fencing of the sea" and territorialization of the marine space (Chmara-Huff, 2014:4; Raycraft, 2019) and thus producing socio-spatial injustices (Dahou & Cheikh, 2007; Cormier-Salem, 2014; Said et al., 2017), MPAs first and foremost impact local resource-dependent communities (Bennett & Dearden, 2014b; Kamat, 2014). This is particularly so in developing

countries, where communities living at sites where MPAs are being established tend to have low incomes that render them vulnerable to imposed constraints on their rights to access and exploit the resources they depend on (Bryceson, 2014:189). Despite a growing body of literature on the social dimensions of MPAs (Charles & Wilson, 2009; Mascia et al., 2010; Cinner et al., 2014; Bennett et al., 2020; Rasheed, 2020), examining community perceptions of such impacts thus remains crucial (Bennett & Dearden, 2014b).

For another, MPAs cannot be designed, implemented, managed nor assessed in isolation from the "bigger picture" they are part of (Cicin-Sain & Belfiore, 2005; Charles & Wilson, 2009), not least the regional fisheries political economy (Ramesh & Rai, 2017). This is particularly so in contexts where external demand and fishing pressure is high (Jentoft et al., 2007). The complex social relations within and between communities, and their multi-scalar relations to broader socio-political forces in this regard often make it difficult to solve conservation/natural resource management issues on a strictly localized scale only, such as through the establishment of MPAs (Chmara-Huff, 2014:3). Bearing in mind Smith's (1992) "politics of scale" metaphor positing that scale is in essence socio-politically constructed, the preceding in turn begs for paying closer attention to the scalar politics surrounding MPA implementation in different contexts (Gray et al., 2014), and the ways different actors gain or lose from given scalar arrangements (Boyle, 2002; Brown & Purcell, 2005; Neumann, 2009).

Senegal strongly relies on fisheries for its national economy (Sall et al., 2006; Ka & Gueye, 2020:7), its food security (Ndoye et al., 2003; Belhabib et al., 2015c), and its cultural continuity (Sall, 2007; Fontana & Samba, 2013). However, overexploitation and the long warned decline of fish stocks (Laloë & Samba, 1990; Diallo, 2000; Thiao et al., 2012; Baldé et al., 2018; Thiaw et al., 2020), the long-lived competition and contention over marine space and resources between the artisanal and industrial subsectors (DuBois & Zografos, 2012), with the industrial subsector increasingly plagued with illegal fishing activities (Belhabib et al., 2014; Belhabib, 2017; Belhabib et al., 2020), has since the 1990s led Senegalese artisanal fisheries into a social-ecological crisis (Sarr, 2012). With the aim of addressing this crisis, MPAs have since the mid-2000s constituted, through joint efforts of the State and international environmental NGOs (Cormier-Salem, 2006; Dahou, 2010; Breuil, 2011), the favored strategy for managing fisheries (Ngom, 2013; Diouf & Sané, 2020). This overall picture begs for a more contextual understanding of the impacts of Senegalese MPAs on artisanal fisheries.

1.2. Problem statement

In light of the preceding, and hearing recent calls for expanding the use of political ecology to the maritime domain (see Bennett, 2019a), this thesis adopts a political ecology lens with the aim to providing a contextual analysis of the Joal-Fadiouth MPA (JFMPA) established in 2004 along the Atlantic coast in Senegal. Examined will first be the local implementation of the JFMPA as a fisheries management intervention and its consequences for artisanal fishers, before situating this intervention within the broader political economic seascape, with the aim to unveiling why the local scale, inherent to the JFMPA, remains the one favored for addressing overfishing and marine resource degradation in Senegalese waters.

Fieldwork in Senegal was for the purpose of this research conducted during three months from February 23rd to May 23rd 2021, in the midst of the unfolding global COVID-19 pandemic and its tragic consequences for many, and not least for Senegalese artisanal fisherfolk communities (Ka & Gueye, 2020). This socio-economic burdensome context must, when reading the following chapters of this thesis be kept in mind.

1.3. Objectives and research questions

The formulated objectives and research questions for this study are the following:

1) To examine the implementation of the JFMPA as a fisheries management intervention and its impact on artisanal fishers

a) How is the JFMPA being managed and operationalized?
b) What consequences does the JFMPA have for artisanal fishers at sea?
c) What are the reasons behind non-compliance with the JFMPA among artisanal fishers?

2) To situate the JFMPA within the broader political economic seascape, and unveil why the local scale, inherent to this fisheries management intervention, is the one favored for addressing overfishing and marine resource degradation in Senegalese waters

a) What are the causes of marine resource degradation and scarcity perceived by artisanal fishers and fishmongers?
b) Who are the "winners" and "losers" as a result of the territorialization of the marine space by the JFMPA?
c) Why is the local scale, inherent to the JFMPA, favored for addressing overfishing and marine resource degradation in Senegalese waters?

1.4. Motivation and rationale

Artisanal fisheries find themselves increasingly marginalized in the face of growing competition for both marine resources and space, and particularly so around the coastline of the African continent, where this vibrant subsector is essential to the livelihoods and food security of many. Giving a strong voice particularly to the artisanal fisherfolk operating in Joal-Fadiouth, this study seeks to contribute to the flourishing academic literature on the "peopled seas" (see e.g. Berkes, 2015; Bennett, 2019b; Gustavsson et al., 2021). Inscribing my research in this body of literature, I am hoping to trigger further engagement and discussion with the intent to critically advancing fisheries decision-making towards what Bryceson (2014) describes as "ecologically sustainable *and* socially just fisheries management" (:190; emphasis added).

1.5. Structure

This thesis is organized into seven chapters. Following this introduction, chapter 2 presents the background to my research. In this chapter I expand in greater length on marine protected areas and artisanal fisheries, before presenting the context in which this study is inscribed, namely Senegal and Senegalese fisheries. Chapter 3 lays out the analytical lens I am employing throughout this study, political ecology, and particularly the "degradation and marginalization" thesis, and the "conservation and control" thesis, as formulated by Robbins (2019). I endeavor in this study linking these two theses through an emphasis on power relations over the marine environment and their expression, drawing upon Smith's (1992) "politics of scale" metaphor, in scalar politics, and in this regard particularly in the scaling and production of fisheries management/conservation interventions such as the JFMPA. Chapter 4 presents the methodology adopted for, and the related choices made along the conduction of this research,

as well as the case under study, that is the JFMPA. In this chapter are also being presented the challenges encountered, and reflections on ethical considerations. Chapter 5 unfolds the findings of my research and their analysis, and in this regard presents the way the JFMPA currently is being implemented, its impacts for artisanal fishers, and the reasons behind their non-compliance, as well as the broader political economic seascape I have found the JFMPA to be situated in. Chapter 6 constitutes the discussion of my findings, and answers the research questions that have not been answered in the previous chapter, that is the research questions pertaining to objective two. Chapter 7 finally concludes this thesis by summarizing my findings, analysis, and discussion, and lays out what in my view constitute possible interesting avenues for further research around MPAs and artisanal fisheries.

2. Background

This chapter lays out the background I deem necessary for the reader to bear in mind along the pages of this study. Hence, after providing some background information on marine protected areas, this chapter succinctly defines the artisanal and fisheries subsectors, before providing contextual elements pertaining to Senegal, and particularly Senegalese fisheries, the social-ecological crisis faced particularly by the artisanal subsector in the country, and finally the shift towards fisheries co-management, not least through the implementation of marine protected areas from the mid-2000s onwards.

2.1. Marine protected areas

As complex social-ecological systems (Charles & Wilson, 2009) and spatial constructs shaped by interactions between social and ecological networks (Dahou, 2010:89), MPAs constitute today one of the most widely used tool for marine conservation and fisheries management worldwide (Gaines et al., 2010; Gray, 2010; Rice et al., 2012; Bryceson et al., 2014; Berkes, 2015). This is particularly so in developing countries, where start-up costs are generally low (Chmara-Huff, 2014:2). Where established, MPAs are aimed at reducing the pressures resulting from human uses, by setting a degree of protection that can range from strict protection where all extractive activities are prohibited, to less strict measures under which multiple uses are allowed but regulated (Mwaipopo, 2008:ix). While no definition of MPAs has been agreed upon internationally, the most widely accepted one remains that of the International Union for the Conservation of Nature (IUCN):

> "Any area of intertidal or subtidal terrain, together with its overlaying waters, and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment" (IUCN, 1994b).

Interest in MPAs first arose globally during the 1980s, following the adoption of the United Nations Convention on the Law of the Sea (UNCLOS) in 1982, before growing in momentum at the onset of the next decade, with the establishment of the Convention on Biological Diversity (CBD) in 1993. Indeed, while the process of MPA creation remained fairly limited until the 1990s, it experienced a veritable boom following particularly the 1992 Rio Summit (Cormier-Salem, 2006:601), during which, as Christensen (2004) critically reflects, "the

marriage of conservation and development was sealed […]" (:2). Later, during the early 2000s, interest in MPAs was further boosted following the 2002 World Summit on Sustainable Development in Johannesburg, South Africa, and all the more so following the 5th IUCN World Parks Congress, held the year after in Durban, South Africa (Sanders & Cochrane, 2014:8).

Over the past decade, the designation of MPAs has been driven chiefly by the desire of parties to the CBD to protect 10% of the global coastal and marine areas, as a fulfillment of their commitment to reaching Aichi Target 11[1] by 2020 (CBD, 2010a; CBD, 2010b). Although warnings have been issued against the push for quantity over quality in the search of meeting global MPA coverage targets (see Agardy et al., 2003; De Santo, 2013; Agardy et al., 2016), the number of, and area covered by MPAs is likely to keep increasing in the coming years, in connection with the enhanced global conservation ambitions of the CBD (Bennett et al., 2020; CBD, 2020), as well as alternative radical global conservation proposals (Wilson, 2016; Büscher et al., 2017; Schleicher et al., 2019). As part of the international effort for their promotion, MPAs are being presented and advocated for as "a globally applicable tool, to be used to protect global oceans" (Gray, 2010:333). Yet when implemented locally, MPAs "encounter", and must "fit" national institutions and legal frameworks, as well as local ecological, social, and cultural realities (Leloup, 2011:2).

Catalyzing the interests of a broad range of actors particularly in the international biodiversity conservation policy-making fora (Gray et al., 2014), MPAs vary greatly in purpose and application (Sanders & Cochrane, 2014:9). In that regard, a useful classification for understanding the different types of MPAs, is that developed by the IUCN. Initially developed for terrestrial protected areas (IUCN, 1994a), this global classification has later been adapted for MPAs (Day et al., 2012) (table 1). The classification is composed of seven categories, based on the overall management objective of a given MPA. In practice, however, these spaces are most often distinguished between no-take areas and multiple-use areas (Sanders & Cochrane, 2014:7). The former, also referred to as marine reserves, constitute fully protected areas where all extractive use is prohibited, while the latter constitute only partially protected areas where some extractive use remains allowed – based on the objective(s) of a particular MPA as well as

1 Aichi Target 11: "By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes" (CBD, 2010a).

on its socioecological context (*ibid*). Multiple-use areas are often being favored to no-take areas, because a broader range of users still has access to those areas and the marine resources within their boundaries (Claudet et al., 2020:381). Costello and Ballantine (2015) for instance found that more than 94% of MPAs worldwide allow some form of fishing. Others however, like Berkes (2015), argue that too much emphasis remains put on people-free MPAs (:170).

Table 1: IUCN protected area management categories.

Protected Area Category and International Name	**Management Objectives**
Ia - Strict Nature Reserve	Strictly protected for biodiversity and also possibly geological/ geomorphological features, where human visitation, use and impacts are controlled and limited to ensure protection of the conservation values.
Ib – Wilderness Area	Usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, protected and managed to preserve their natural condition.
II – National Park (ecosystem protection; protection of cultural values)	Large natural or near-natural areas protecting large-scale ecological processes with characteristic species and ecosystems, which also have environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.
III – Natural Monument	Areas set aside to protect a specific natural monument, which can be a landform, sea mount, marine cavern, geological feature such as a cave, or a living feature such as an ancient grove.
IV – Habitat/ Species Management	Areas to protect particular species or habitats, where management reflects this priority. Many will need regular, active interventions to meet the needs of particular species or habitats, but this is not a requirement of the category.
V – Protected Landscape or Seascape	Where the interaction of people and nature over time has produced a distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.
VI – Protected Area with Sustainable Use of Natural Resources	Areas which conserve ecosystems, together with associated cultural values and traditional natural resource management systems. Generally large, mainly in a natural condition, with a proportion under sustainable natural resource management and where low-level non-industrial natural resource use compatible with nature conservation is seen as one of the main aims.

Source: Day et al. (2012).

Most of the (natural) science in support of MPAs, must be noted, is based on the ecological dynamics of no-take areas (Halpern, 2003; Lester et al., 2009; Claudet et al., 2020:380). There is indeed abundant evidence that such MPAs are the most effective type when it comes to

restoring and protecting marine biodiversity (Sala & Giakoumi, 2017; Sala et al., 2018:12). Empirical evidence regarding the benefits of no-take areas for species thriving within their boundaries points to higher densities and biomass, larger mean size of individual fish, and greater taxonomic diversity of organisms – inside compared to outside or after compared to before MPA establishment, thus demonstrating the expected ecological effects within MPA boundaries (Mosquera et al., 2000; Halpern, 2003; Williamson et al., 2004).

These results, however, constitute no evidence for the ecological "benefits" of MPAs for fisheries beyond their boundaries – so-called "benefits beyond boundaries" (Gell & Roberts, 2003), and indeed no empirical studies convincingly show increased yields from spillover – the migration of adult fish from inside an MPA towards outside fishing areas, which is often only localized within limited margins around an MPA (Kolding, 2014:35). Yet, both the spillover and recruitment effects are crucial to MPAs' fisheries management objective (Sanders & Cochrane, 2014:15). Hence, for Kolding (2014), MPAs are best used as conservation tools instead than as fisheries management tools[2]. In light of the preceding and as noted by Gray et al. (2014), a lack consensus remains prevailing vis-à-vis what constitute MPAs and how these should be implemented.

In a context where the multiple purposes of MPAs keep dividing scientists, managers and decision-makers regarding their appropriateness (Cormier-Salem, 2014:11), the claim that MPAs lead to win-win outcomes for conservation, fisheries management, and socioeconomic development has become the prevalent public discourse (Bennett & Dearden, 2014a:96; Sanders & Cochrane, 2014; Chaigneau & Brown, 2016:1). MPAs are indeed increasingly being established with the aim of meeting these three objectives – not least in Senegal (Diouf & Sané, 2020). The concurrent achievement of these goals is, however, less successful in practice than in theory (Bennett & Dearden, 2014a:96; Chaigneau & Brown, 2016), reflecting what Christensen (2004) coined – as opposed to win-win solutions, "win-win illusions". This is not only due to MPAs' aforementioned lack of effectiveness vis-à-vis fisheries management (Kolding, 2014), but all the more so because the win-win discourse surrounding MPA advocacy and implementation wrongly assumes that all individuals within a fisherfolk community would, if "benefits" were to occur, perceive these to the same extent (Chaigneau & Brown, 2016:2).

[2] While I focus with this research on the JFMPA as a fisheries management tool – one of its proclaimed objectives (see chapter 4), my findings underline indeed the predominance of conservation (see chapter 5) and the clash between the multiple objectives.

Failing to achieve all the goals set for a given MPA is yet problematic. As Chuenpagdee et al. (2013) stress, "when MPAs do not deliver what they intend to do, the damage may already be beyond repair" (:234).

This, in turn, begs for paying closer attention to the "human dimension" of MPAs (Charles & Wilson, 2009). Scientists and managers are indeed increasingly considering the social dimensions, and multiple impacts resulting from such fisheries management/conservation interventions (Mwaipopo, 2008; Mascia et al., 2010), including livelihood changes (Moshy et al., 2015; Mizrahi et al., 2019; Mizrahi et al., 2020), displacement (Mascia & Claus, 2009; Cinner et al., 2014), issues of social equity (Bennett et al., 2020) and human well-being more broadly (Gjertsen, 2005; Rasheed, 2020). Nonetheless, often constituting "territories of exclusion" (Chmara-Huff, 2014:11), MPAs bring about important socioeconomic hardship for fisheries-dependent communities living where these spaces are being established (Benjaminsen & Bryceson, 2012; Kamat, 2018). Reducing and restricting fishing activities within a given zone, MPA indeed often alter relationships among resource-user groups, thus adding to existing, or generating new conflicts (Jentoft et al., 2007:617). In this light, not a mere technical management intervention, MPAs must be envisioned a "socio-political enterprise" (Chuenpagdee et al., 2013:234), and their implementation indeed constitutes a true matter of political ecology (Childs & Hicks, 2019:330).

Finally, MPAs are deeply impacted by the broader ecological, socioeconomic, and indeed political context of the land- and seascape they are nested in (Cicin-Sain & Belfiore, 2005:850). What is happening outside MPA boundaries may in this capacity be just as important as what is happening inside them, thus requiring to fathom MPAs embedded within larger complex social-ecological systems (Jentoft et al., 2007:617) and multi-scalar social-ecological relations (Berkes, 2002; Adger et al., 2005; Berkes, 2006). This then, requires particularly paying closer attention to the forms of industrial marine resource extraction taking place in the broader seascape (Ramesh & Rai, 2017), often concurrently with artisanal fisheries (Fontana & Samba, 2013; Belhabib et al., 2014), which I endeavor defining under the following subsection.

2.2. Artisanal fisheries

In the literature, the term "artisanal fisheries" is often used interchangeably with "small-scale fisheries" (Ruttan et al., 2000; Berkes, F., Mahon, R., McConney, P.,, 2001; Pauly, 2006), with yet often no clear operational distinction between the two (Cochrane & Garcia, 2009). For Pauly (2018) for instance, artisanal fisheries, along with subsistence and recreational fisheries, belong to the small-scale subsector. On the other hand, Rousseau et al. (2019) observe clear geographical patterns in the use of each of the terms "artisanal fisheries" or "small-scale fisheries" in legal texts between countries, with for instance a more prevailing use of the former term over the latter on the African continent – including in Senegal (see e.g. DPM, 2018).

Despite the undeniable importance of artisanal fisheries globally (Béné, 2006; Béné et al., 2007; Béné et al., 2010), both in terms of catches and employment (FAO, 2020), no consensus exists as to how defining the subsector (Rousseau et al., 2019), and different descriptions can therefore be found across the relevant literature. For Garcia (2009), for instance, artisanal fisheries imply:

> "a simple, individual (self-employed) or family type of enterprise (as opposed to an industrial company), most often operated by the owner (even though the vessels may sometimes belong to the fish monger or some external investor), with the support of the household, […and with] no obvious reference to size but [with] a connotation of relatively low levels of technology but this may not always be the case" (:474).

Pauly (2018) in addition emphasizes the importance of artisanal fisheries in supplying local markets with animal protein – although also increasingly marketing their products internationally as well. He furthermore emphasizes the better efficiency of artisanal fisheries in terms of fish caught per ton of fuel consumed compared to industrial fisheries, and the more selective fishing practices of the former fishery over the latter[3] (Pauly, 2018) (see figure 1 for an overview of the characteristics defining artisanal fisheries across West Africa particularly).

[3] Artisanal fisheries have indeed long been defined in comparison to industrial fisheries and vice-versa (see e.g. Thomson, 1980).

- Catches are aimed at local consumption but also export markets;
- Fisheries are labor intensive;
- Fisheries require and generate low economic input and output with fuel costs constituting most of the economic input;
- Fisheries are increasingly motorized, but with low access to technology;
- Fisheries are conducted generally close to shore;
- Fisheries are non-gender discriminative as women are also involved in this subsector;
- Fisheries are multispecies but highly selective;
- Fisheries can be either part time or full time;
- Fisheries are usually minimally managed, herein including artisanal and subsistence fisheries.

Figure 1: Defining characteristics of West African artisanal fisheries.
Source: Belhabib et al. (2015c).

As Kolding (2014) stresses, "the multi-gear (overall unselective) fishing pattern employed in many small-scale fisheries [or indeed artisanal fisheries], combined with the ability of fishermen to constantly adapt and change their target species, is the closest example of the optimal exploitation pattern that exists" (:41). The social-ecological resilience and sustainability that thus more often than not characterizes artisanal fisheries, is in stark contrast with the ecologically more harmful practices of capital-intensive large-scale industrial fleets, which despite operating in the marine waters of developing countries, are generally foreign-owned and linked to distant international markets (Bryceson, 2014:189), located not least in the Global North, including the EU, Japan, and the USA (Swartz et al., 2010). In this context, yet, too scant attention for global artisanal fisheries, and particularly their central role in terms of food production and contribution to food security, employment, and local marine resource management is aggravating their political marginalization in international and national fisheries governance, not least in Senegal (Sall & Nauen, 2017:610).

2.3. Geographical context – Senegal

The Republic of Senegal, covering an area of 196 722 km^2, is a coastal sub-Saharan country located at the westernmost point of Africa. The country, surrounding its Anglophone neighbor the Gambia, is bordered by Mauritania to the north, by Mali to the east, by Guinea and Guinea Bissau to the south, and opens on the Atlantic Ocean and an Exclusive Economic Zone (EEZ) of approximately 200 000 km^2 to the West with a more than 700 km-long coastline (Breuil, 2011:74; Government of Senegal, 2017; DEEC, 2020; World Bank, 2020). The latter can be subdivided into three parts (figure 2): from Saint-Louis – the northernmost coastal city – to the capital city Dakar, large sand dunes border what is known as the "great coast" (*Grande Côte*); south of Dakar stretches what is known as the "small coast" (*Petite Côte*); even further south, the coastline is interrupted by the Sine Saloum Delta, and by the River Casamance's estuary (Bonnin et al., 2016:18).

Figure 2: Map of Senegal.
Basemap source: "Service Layers : ESRI; Here, Garmin, NGA, USGS".

Ranked 168 out of 189 based on the Human Development Index of the United Nations Development Program (UNDP), Senegal is one of the poorest countries in the world (UNDP, 2020). The country has a population of 16.3 million (UNDP, 2020), of which one quarter lives in the region of Dakar (World Bank, 2020). However, with 47.7% of urban population, the country remains predominantly rural (UNDP, 2020). More than 75% of the total population lives on a less than 60 km-wide coastal strip (Ngom, 2013:13), making the coast one of the most dynamic zones in the country (Cormier-Salem, 2013). The currency is the CFA franc (FCFA)[4], a currency recently described as "Africa's last colonial currency"[5] (Pigeaud & Sylla, 2021). Although French has following nearly three centuries[6] of French colonization remained the official language, Wolof constitutes Senegal's lingua franca (Badkhen, 2018:34). In this regard, colonization profoundly shaped the country's governance system, which like many former French colonies, inherited a centralized administration that concentrates all powers, particularly regarding the governance of fisheries (Sarr, 2012:6).

2.3.1. Senegalese fisheries

Fisheries are essential to the Senegalese economy. Senegal indeed is the third largest fishing nation on the African continent (Le Roux & Noël, 2007:72). In 2015, fisheries accounted for 3.2% of the country's GDP (FAO, 2017). Fishing as well as the subsequent processing of seafood, ancient activities in the country (Chauveau, 1982; 1984; 1986), are not only of high economic importance, but also culturally and socially paramount (Mbaye, 2016:3), particularly given the central place of fish in the Senegalese population's diet[7] (Ndoye et al., 2003:2). Besides in the Tambacounda region, the share of fish in animal protein intake accounts in all regions of Senegal for over 75% (UNEP, 2002:1), and is thus crucial to national food security (Belhabib et al., 2015c). In the country, fisheries can be distinguished into two main subsectors: artisanal fisheries and industrial fisheries (Samba, 1994), with the fishing zones attributed to each sector established by the Maritime Fishing Code.

[4] Exchange rate at the time of writing: 1 Euro = 656 FCFA.
[5] FCFA stands for *franc des colonies françaises d'Afrique*, i.e. franc of the French colonies in Africa.
[6] Senegal gained its independence from France in 1960.
[7] Fish constitutes the basis of one of the most traditional dishes, *ceebu jën* (a fish and fried rice dish served with vegetables).

Artisanal fishing is in Senegal also commonly referred to as "pirogue fishing" (DPM, 2018), "pirogue"[8] being the name of the crafts Senegalese artisanal fishers operate on – 4 to 24 meters-long wooden canoes (Fontana & Weber, 1982:17; Belhabib et al., 2014:8) (figure 3). Originally a subsistence activity undertaken by part of the coastal population, artisanal fisheries have long been considered traditional and informal, and in need of "development" and "modernization" by "developers" (Chauveau, 1984; 1985; Chauveau & Samba, 1989). The artisanal subsector expanded particularly following the drought period that Senegal faced during the late 1970s, which led many farmers and farm workers towards the coastal zone and fishing or fishing-related activities to make a living (Sarr, 2012:10; Cormier-Salem, 2013). This rural exodus provided most of the working force with the artisanal fisheries subsector, where still today, groups of new fishers cohabit with so-called traditional fishers (Sall, 2007:154).

Figure 3: Photo of small pirogues on the beach of Joal, Senegal
(Photograph: Louis Pille-Schneider).

Seen by the Senegalese State a vector for national development – particularly from the early 1980s onwards and the implementation of Structural Adjustment Programs[9], artisanal fisheries have over the decades been targeted by many sectoral policies and development projects geared

[8] Although opinions on this diverge (Kandji, 2006), the very name of the country Senegal itself is said by some to come from *sunyu gaal*, which in Wolof means "our pirogue" (see Colin, 2007).
[9] Senegal was the first sub-Saharan country to be negotiating a Structural Adjustment Program with the World Bank, as a result of which government support to the – at the time nascent – national industrial fleet was drastically reduced and redirected towards export-stimulating mechanisms (Brown, 2005).

towards expanding the subsector. These were often financially supported by international institutions including the African Development Bank and the World Bank, as well as the Japan International Cooperation Agency (JICA), the French Development Agency (AFD, *Agence française de développement*), and the EU (Sarr, 2012:1). With little over 19 000 pirogues last censused as of April 2019 (CRODT, 2020:8), Senegal remains today home to the most developed artisanal fleet of Africa (Belhabib et al., 2014:1), which constitutes the entry point of a well-defined value chain (Sall et al., 2006), organized around the exploitation and processing of both pelagic and demersal fish species, as well as cephalopods (Fontana & Samba, 2013).

In terms of people employed within the subsector, the figure of 600 000 people is the one most frequently found in the relevant literature (see e.g. Horemans & Kébé, 2006:6). This figure is however considered by many highly underestimated (Alassane Samba, former Director of CRODT, pers. comm.). Another figure suggested more recently, is that of 825 000 people relying on fisheries for some portion of their income (Harper & Sumaila, 2019:15). Within the artisanal subsector, activities are divided into four quarterly period: *noor* (January-March); *thiorone* (April-June), *nawett* (July-September), and *lolli* (October-December) (Ka & Gueye, 2020:15). This seasonal organization of the activity reflects notably the strong adaptability of the artisanal fleet, one of its core features (Sall, 2007), which is epitomized in three key elements: the use of multiple types of fishing gears[10], based on biological, social and economic factors; the redeployment of part of the fishing effort to different species depending on seasonal changes; and migration along the Senegalese coast and off the broader West African sub-region in search of fish as well as marketing opportunities (Sall et al., 2006:9).

Industrial fisheries, on the other hand, are in Senegal comprised of a domestic fleet – or "so-called domestic fleet" (Belhabib et al., 2013:1), and a foreign distant-water fleet (DPM, 2018:31). According to the most recent official statistics from the Directorate for Marine Fisheries (DPM, *Direction des Pêches Maritimes*), in 2018 141 vessels, including 122 Senegalese and 19 foreign vessels, were fishing in waters under national jurisdiction, with the domestic fleet consisting of 106 demersal trawlers, 11 tuna vessels, and 5 purse-seiners targeting small-pelagic species, and the foreign fleet consisting of 16 tuna vessels and 3 hake vessels (DPM, 2018:31). While the diverse and diffuse artisanal fisheries are represented by

[10] E.g. nets (set and drift gillnets, beach and purse seines), lines (longlines, squid jigs), or traps (Samba, 2013).

multiple organizational bodies, industrial fisheries are represented by a single politically powerful organization (Hurley & Manel, 2015:655), the Senegalese organization of shipowners and industrial marine fisheries (GAIPES, *Groupement des armateurs et industriels de la pêche du Sénégal*) (Sarr, 2012).

2.3.2. The social-ecological artisanal fisheries crisis and the shift from top-down fisheries governance to the implementation of co-managed MPAs

In the context of a growing fishing effort – both from the artisanal and industrial subsectors, many fish stock have since the early 1990s, been faced with overexploitation in Senegal's marine waters (Laloë & Samba, 1990; Diallo, 2000). Both small-pelagic species that are vital for national and regional food security, including e.g. round sardinella (*sardinella aurita*) and flat sardinella (*sardinella maderensis*) (FAO, 2019; Samba et al., 2021), and bonga shad (*ethmalosa fimbriata*) (Baldé et al., 2018), and demersal species – often destined to the export market, including e.g. white grouper (*epinephelus aeneus*) (Thiao et al., 2012; Ndiaye et al., 2013). This overexploitation of fish stocks has led the artisanal subsector particularly, into a social-ecological crisis, which from the late 1990s onwards led the State to initiate slow policy changes vis-à-vis fisheries management (Sarr, 2012). Despite remaining predominantly centralized, fisheries governance has in this context come to shift from a top-down system to more inclusive and participatory co-management[11] arrangements with the artisanal subsector (Belhabib et al., 2017:457) (table 2).

It is in this very context that the five first Senegalese MPAs were established on November 4th 2004 by decree n°2004-140812, in Abene, Bamboung, Joal-Fadiouth, Kayar, and Saint-Louis (Bonnin et al., 2016:118). The advocacy for, and establishment of these MPAs was chiefly driven by two international conservation NGOs involved in Senegal, the World Wildlife Fund (WWF)13 and the IUCN, as well as by a national NGO – Océanium (Breuil, 2011:88; Leloup, 2011:6; Ngom, 2013:30). Following its independence, Senegal has had an important history of

[11] In the context of fisheries, Berkes, F. (2001) defines co-management as "a partnership in which government, the community of local resource users (fishers), external agents (non-governmental organizations, academic, and research institutions), and other fisheries and coastal resource stakeholders (boat owners, fish traders, money lenders, tourism establishments, etc.) share the responsibility and authority for making decisions about the management of a fishery" (:202).

12 Decree No. 2004-1408 of November 4th 2004 on the creation of marine protected areas.

13 The Senegalese WWF office has since then been closed due to internal misfunctioning.

coastal parks and reserves establishment (e.g. the three Barbary Spit, Madeleine Island, and Saloum Delta National Parks in 1976, and later the Delta du Saloum Biosphere Reserve in 1984) (Cormier-Salem, 2013:140). Unlike these early parks and reserves, however, MPAs established in Senegal from 2004 onwards build on a community-based natural resource management rhetoric (Cormier-Salem, 2014:4), which since the establishment of the CBD particularly, has come to emphasize local appropriation strategies in face of the global exploitation of marine resources (Dahou & Cheikh, 2007; Dahou, 2009).

Table 2: Evolution of Senegalese coastal and marine resource management policies post-independence.

1970-1980s: Rapid growth of the artisanal fisheries subsector driven by an increasing demand for fish and by technological innovations under public policies aiming for rational management in the name of modernization, intensification, and increases in production.
1980-1990s: Rise of environmental concerns around the state of marine ecosystems in Senegal – in line with growing international environmentalism, "environmentalization" of public policies, and development of action plans aimed at protecting marine and coastal biodiversity, under the pressure of environmental NGOs particularly.
2000s-today: Integrated approach to coastal zone management including – following the 5th IUCN World Parks Congress in 2003 – the creation of MPAs, no longer designed as tools for controlling and excluding fishers, but as tools for the sustainable co-management of marine and coastal resources.

Source: Cormier-Salem (2013).

Hence, in Senegal the national strategic vision for MPAs is the following:

> "A coherent network of MPAs in Senegal, ecologically representative, effectively co-managed, ensures the conservation of marine and coastal biodiversity, the sustainable management of fishing areas, the enhancement of cultural heritage, the fair and equitable sharing of socio-economic benefits and the improvement of the community livelihoods and conditions" (Diouf & Sané, 2020:9; own. transl.).

As such, MPAs in the country establish a new, multi-sectoral space for public environmental action, one that, based on an ecological imperative, seeks to integrate conservation, fisheries management, and socioeconomic development objectives – thus embracing the aforementioned multiple-wins discourse, while disregarding pre-existing administrative decoupages (Leloup, 2011:8).

In terms of management, MPAs have in Senegal until 2008 been the responsibility of the Directorate for National Parks (DPN, *Direction des Parcs Nationaux*), under the Ministry of Environment and Sustainable Development (MEDD, *Ministère de l'Environnement et du Développement Durable*) (Ferraro et al., 2011:568). The same year, a ministerial reorganization transferred MPA management responsibility to the DPM, under the Ministry of Fisheries and Maritime Economy (MPEM, *Ministère des Pêches et de l'Économie Maritime*) (*ibid*). In 2012, under the MEDD again, the Senegalese authorities created the Directorate for Community-based Marine Protected Areas (DAMCP, *Direction des Aires Marines Communautaires Protégées*), whose mission is to implement the aforementioned national strategy pertaining to the management of the country's MPA network[14] (Diouf & Sané, 2020). The creation of new MPAs in Senegal remains in the current moment underway, as reflected in the newly established MPA around the Island of Gorée, during May 2020 (MEDD, 2020).

[14] MPAs in Senegal are, for most, part of the Regional Network of Marine Protected Areas in West Africa (RAMPAO, *Réseau régional d'Aires Marines Protégées en Afrique de l'Ouest*).

3. Analytical lens

This chapter outlines the analytical lens I employ throughout this study – not least in the analysis and discussion of my findings under respectively chapters 5 and 6, namely a political ecology. After providing some introduction and background to political ecology, I explain in the present chapter more specifically the relevance of the adopted analytical lens to this study. To this end, I delve into the very tenets of political ecology that I am engaging with. These are first and foremost the two "degradation and marginalization" and "conservation and control" theses – formulated by Robbins (2019) as a way to summarizing the central themes and related insights about them in political ecology scholarship, which I endeavor linking through an emphasis on power relations over the marine environment and their expression – drawing upon the "politics of scale" metaphor – in scalar politics, and in this regard particularly in the scaling and production of fisheries management/conservation spaces such as the JFMPA.

3.1. Political ecology

Political ecology is a flourishing field of research. In their cornerstone work *Land Degradation and Society*, Blaikie and Brookfield (1987) define political ecology as an approach that "combines the concerns of ecology and a broadly defined political economy [and] encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself" (:17). Marxist scholar analyses of political economy particularly, and their attention for the biophysical dimensions of capitalist accumulation, have indeed been foundational to the emergence of political ecology (Castree, 2015), at the convergence notably of cybernetics and systems theory, cultural ecology and ecological anthropology, and natural hazards and disaster research from the 1970s onwards (Watts, 2000; 2015).

Until this day, political ecology remains a plural and diverse field of inquiry grounded in, and spanning across as broad disciplines as geography, sociology, anthropology, environmental history, and natural resource management (Zimmerer & Bassett, 2003:2). From its inception, however, Watts (2000) notes, political ecology never represented a coherent theoretical position – due not least to the multiple meanings attached to ecology, political economy, and politics by

different scholars. Hence, as Robbins (2019) suggests, political ecology is, rather than a theory or a method, "a term that describes a *community of practice* united around a *certain kind of text*" (:17; emphasis in the original); reason why I favor for this chapter the labeling *analytical lens*, rather than for instance *theoretical framework*, or else.

Emphasized within political ecology, and perhaps best formulated in the words of Harvey (1993), is that "all ecological projects (and arguments) are simultaneously political economic projects (and arguments) and vice versa. Ecological arguments are never socially neutral any more than socio-political arguments are ecologically neutral" (:25; cited in Bryant & Bailey, 1997). What political ecology thus has to gain from its engagement with a "broadly defined political economy" (Blaikie & Brookfield, 1987), and which I find particularly important to bear in mind for the purpose of this study, is that

> "(1) Social and cultural relationships are rooted in economic interactions amongst people and between people and non-human objects and systems, (2) exogenous imposition of unsustainable extractive regimes of accumulation results in environmental and social stress, and (3) production for the global market leads to contradictions and dependencies" (Robbins, 2019:56).

One comprehensive way of framing *political* ecology is to further envision it challenging *apolitical* ecological projects. This entails in the study of environmental change and human-environment interactions adopting an approach "identifying broader systems rather than blaming proximate and local forces, […] viewing ecological systems as power-laden rather than politically inert, […] and taking an explicitly normative approach rather than one that claims the objectivity of disinterest" (Robbins, 2019:10). The very essence of political ecology is thus to incorporate political dynamics into analyses of ecological projects so as to enhance our understanding of the dialectical processes underpinning the appropriation, contestation, and manipulation of the non-human world by humans (Paulson et al., 2003:210).

As such, political ecology is more often than not considered a "critical approach" (Benjaminsen & Svarstad, 2019). Yet as Walker (2006) warns, "critique *alone* rarely produces significant policy changes" (:385; emphasis in original). This, indeed, is the reason why political ecology scholarship articulates around the synchronous process of "wielding its intellectual hatchet" – in exposing the flaws and deconstructing the narratives not least of the very policies that produce socio-environmentally negatives outcomes – and "planting intellectual and practical seeds" – the progressive side of the field that is occupied with describing and suggesting ways

of doing different (Robbins, 2019:97). In these processes, however, political ecology has at times been criticized for lacking the ecology, with the latter seen merely constituting the background of studies in the field, leading for instance Walker (2005) to critically ask "where is the ecology in political ecology?" (:73). Earlier, in their pamphlet article *Against Political Ecology*, Vayda and Walters (1999) memorably also relabeled political ecology "politics without ecology" (:168).

For the purpose of this thesis, should be clarified, politics – and thus the very "political" element inherent to political ecology – are being envisioned as "the practices and processes through which power, in its multiple forms, is wielded and negotiated" (Paulson et al., 2003:209). This in turn begs for a clarification of my use of the concept of "power" as part of this study. Fair to say, as Walker (2006) stresses, a political ecology that has no attention for power in the shaping of human-environmental relations would by many not be considered political ecology at all. Indeed "everywhere and nowhere" within political ecology (Ahlborg & Nightingale, 2018:382), power is yet often considered to be poorly conceptualized in practice (see Paulson et al., 2003; Svarstad et al., 2018). Following the influential contribution by Ribot and Peluso (2003), power is in this study being envisioned as "the capacity of some actors to affect the practices and ideas of others … [and] as emergent from, though not always attached to, people … [whereby] disciplining institutions and practices can cause people to act in certain ways without any apparent coercion" (Ribot & Peluso, 2003:156; cited in Svarstad et al., 2018). Such a predominantly actor-oriented approach to power is deemed particularly relevant to this research given the important focus on artisanal fishers' interactions with various actors and institutions exerting their power(s) over the marine environment.

In that regard, a growing body of political ecology research focused on the ocean and coastal environments is analyzing how power(s) play(s) out in such contexts (Boucquey et al., 2016; Childs & Hicks, 2019; Kull & Andriamahefazafy, 2019), and particularly how control over, and access to marine resources is conditioned by power imbalances between various groups of for instance fishers, and State representatives (Bennett, 2019a). This includes the privatization of marine resources, not least through the establishment of MPAs (Mansfield, 2004; Gray, 2010; Kamat, 2014). The definition of political ecology by Watts (2000), as a field of study that seeks "to understand the complex relations between nature and society through a careful analysis of what one might call the forms of access and control over resources and their

implications for environmental health and sustainable livelihoods" (:257; cited in Robbins, 2019), seems in my view thus best suited to this study.

Power struggles between particularly the State and society in the process of resource allocation, control, and access, are indeed constant (Peluso, 1993:201). Access, hence, is as part of this study defined, following Ribot and Peluso (2003) yet again, as "the ability to benefit from things – including material objects, persons, institutions, and symbols" (:153). Focusing on *ability* and expanding from the property-centered "bundle of rights" notion to a "bundle of powers" approach to access, this formulation draws attention to a broader range of always-changing dynamic processes and social relationships that may either constrain or enable people to benefit from resources (Ribot & Peluso, 2003). Such a reading of access seems in my view particularly relevant vis-à-vis fisheries, political economy, and not least the political ecology lens adopted as part of this study. As Campling et al. (2012) underline, indeed, "counter to accounts that reduce fisheries access to 'management' alone, a political economy reading reveals access as constituted by social relations that reflect and refract specific histories, geographies, market dynamics and relations of inclusion/exclusion" (:197). Bearing the preceding in mind, I expand in the following sections on the core political ecological tenets I draw upon as part of this study, namely the "degradation and marginalization" thesis, and the "conservation and control" thesis, which I intent to link through the "politics of scale" metaphor.

3.2. The "degradation and marginalization" thesis and the Malthusian overfishing narrative

This study analytically first draws upon the degradation and marginalization thesis, through which the reasons for the change in environmental conditions, and particularly "environmental degradation, long blamed on marginal people, is shown in its larger political and economic context" (Robbins, 2019:18). In the context of fisheries management, the predominant narrative of environmental degradation, and thus about the causes of overfishing, remains today the "Malthusian overfishing narrative" (Finkbeiner et al., 2017). Thomas Malthus – in the classical economics tradition – best known for his *Essay on the Principle of Population* (1970 [1798]) asserted that, as well summed up by Benjaminsen (2015), "population pressure on natural resources is the paramount cause of human misery" (:354-355). Malthus however, Harvey (1974) reminds us, wrote his essay as "an antidote to the hopes for social progress aroused by

the French Revolution" (:258), and essentially as an anti-poor pamphlet aimed at securing resources for the wealthier social classes. Dusted off during the past century, (neo-)Malthusian arguments where taken up notably in cornerstone "eco-doomsayers" publications such as *The Population Bomb* by Ehrlich (1968), and *The Tragedy of the Commons* by Hardin (1968), motivated by their anxiety over the population question – coming in the case of Hardin from a strong radical-right political positioning (see e.g. Hardin, 1974).

The tragedy of the commons particularly, which asserted that the conservative use of a given non-regulated resource was undermined by the self-interest of its users – a pasture and herders in this example, thus leading to that resource being overused, and eventually its depletion (Hardin, 1968), has long been the central leitmotiv driving natural resource management politics. This is particularly true for fisheries (see Gordon, 1954), where it is, as part of a neoliberal agenda, underpinning the concurrent privatization and marketization of the ocean, which have become the dominant mode of governance of the latter (Mansfield, 2004). Blaming all people equally, Hardin's seemingly apolitical explanation for the depletion of natural resources remains popular today, particularly in that, as Mansfield (2011) put it, "it allows us to avoid thorny political questions, such as about who gets to make decisions, whose lives matter more, and who benefits from both using and conserving fish and the ecosystems that produce them" (:96).

While the work by Ehrlich (1968), Hardin (1968), and others, was, due to "its penchant for drastic political prescriptions to solve the world's environmental crisis" at times even described as political ecology, this form of scholarship had been under important criticism from scholars across the political spectrum – not least from the left, and in fact facilitated the emergence of radical development geography, which has been particularly influential in the very development of political ecology (Bryant & Bailey, 1997:11). Harvey (1974) for instance, wrote apropos neo-Malthusian arguments, "conditions appear to be exactly right for the emergence of overpopulation arguments as part of a popular ideology to justify what had and what has to be done to stabilize a capitalist economic system that is under severe stress" (:275).

In light of the preceding nonetheless, Malthusian overfishing thus is, building on the argument that there are "too many fishermen chasing too few fish", as Pauly (1988) infamously once formulated, "what occurs when poor fishermen faced with declining catches and lacking any other alternative initiate wholesale resource destruction in their effort to maintain their income"

(:15) – a reductionistic argument as he later acknowledged (see e.g. Pauly, 2006). An example of the Malthusian overfishing narrative is for instance exemplified in the following fragment:

> "Our long experience of observing coastal resource degradation indicates that the only long-term solutions will be through combating poverty and population growth in developing countries, and by providing strong economic and philosophical reasons for conservation, rather than succumbing to short-term needs of economic consumption. This will require tackling the root causes: expanding populations coupled with rising poverty in these coastal populations […]" (Wilkinson & Salvat, 2012:1103; cited in Finkbeiner et al., 2017).

Problematic is that the Malthusian overfishing narrative, still today, underpins most fisheries-targeted policy interventions and that these work to alienate the most fisheries-dependent people – i.e. artisanal fishers, who find themselves disproportionally forced to bear the costs incurred by these very interventions while the benefits are being captured by others (Finkbeiner et al., 2017:1183). This then calls for a deeper analysis of what Forsyth (2003) refers to as "environmental orthodoxies"– i.e. common explanations of environmental problems (:24), and particularly their impacts on attempts to addressing environmental problems, not least through spatial fisheries management/conservation interventions such as MPAs.

3.3. The "conservation and control" thesis and the territorialization of space

Another important strand of the political ecology literature focuses on what Robbins (2019) refers to as the "conservation and control" thesis. The latter in his words seeks to unveil how

> "Control of resources and landscapes has been wrested from producers or producer groups (associated by class, gender, or ethnicity) through the implementation of efforts to preserve 'sustainability', 'community', or 'nature', [a process in which] local systems of livelihood, production, and socio-political organization have been disabled by officials and global interests seeking to preserve the 'environment'" (Robbins, 2019:169).

The dedicated strand of literature particularly assesses the negative social outcomes of environmental conservation practice, commonly underpinned by the insistence that non-human nature can be "located, fixed, and preserved outside of culture" (Katz, 1998:55). Noteworthy is here indeed that political ecologists see human-nature relationships as dialectically constructed and envision social and environmental conditions as inextricably linked (Blaikie & Brookfield,

1987; Escobar, 1996; Watts, 2000; Adams & Hutton, 2007; Watts, 2015). Negative social outcomes of concern as a result of conservation practice include particularly the displacement and exclusion of people from the areas and resources on which they depend for their livelihoods, and more broadly – as already evident in the aforementioned definition of political ecology – struggles for access to, and control over natural resources (see e.g. Neumann, 1998; Brockington & Igoe, 2006; West et al., 2006; Adams & Hutton, 2007; Kelly, 2011; Benjaminsen & Bryceson, 2012; Holmes & Cavanagh, 2016; Bennett et al., 2020).

Part of broader processes of land and ocean control (see Peluso & Lund, 2011) and pervasive in coastal marine conservation, one process particularly, commonly referred to as "blue grabbing", "coastal grabbing", or "ocean grabbing" (Benjaminsen & Bryceson, 2012; Bavinck et al., 2017; Barbesgaard, 2018), has in that regard received significant attention in the political ecology scholarship on equity-related issues around marine and coastal resources access and control. Ocean grabbing – to pick one formulation only – has been defined as "the dispossession or appropriation of use, control or access to ocean space or resources from prior resource users, rights holders or inhabitants" (Bennett et al., 2015:62). Ocean grabbing, noteworthy, is equally about *influencing* State authority as it is about *getting hold* of marine resources (Foley & Mather, 2019:311).

Central to the conservation and control thesis, furthermore, is the conflict-prone, and more often than not contested territorialization of conservation space (see Corson, 2011; Chmara-Huff, 2014; Holmes, 2014; Bluwstein & Lund, 2018; Raycraft, 2019; Robbins, 2019). Territorialization, indeed, is part of an ongoing spatial reorganization associated with the establishment of protected areas, which results from the continual processes of spatial production (Roth, 2008:375). Territorialization is, following Vandergeest and Peluso (1995), "about excluding or including people within particular geographic boundaries, and about controlling what people do and their access to natural resources within those boundaries" (:388). Bassett and Gautier (2014) further refer to territorialization as "specific territorial projects in which various actors deploy territorial strategies (territoriality) to produce bounded and controlled spaces (territory) to achieve certain effects" (:2), where territories are – in the present context following Barrena et al. (2021) perhaps best envisioned "maritories"[15] – seen

[15] As noted by Barrena et al. (2021), building on that of territory, the concept of maritory "brings to the front a sea perspective; that is, a view of an actor for whom liquid materiality and mobility are more relevant than solid land and fixity" (:4).

"discrete, distinctive, bounded, measurable, communicable spaces that are deliberately created in an effort to achieve certain social goals" (Murphy, 2012:164).

Territorial solutions to land- and ocean-use and related resource conflicts have across the globe become tools of choice (Peluso, 2005:2). Conservation areas particularly, constitute "firmly bounded territorial units" (Roth, 2008:375), and territorialization in that regard substantially contributes to reworking conservation geographies and spaces (Zimmerer, 2000:358; see also e.g. Adams, 2019); not only in the case of exclusionary parks, but also in the case of co-managed areas or community-based protected areas (Agrawal, 2001; Corson, 2011). Protected areas, indeed – including MPAs – constitute such territorialization projects (Chmara-Huff, 2014; Raycraft, 2019), and conflicts over them are first and foremost about defining and defending territories, to which territoriality provides a suitable lens of understanding (Holmes, 2014:1). As underscored by Bassett and Gautier (2014) all territorial projects produce their share of winners and losers (:6).

Sack (1986), one of the first geographers to advocate for the analysis of how and why spatial arrangements come into being, adopts a strictly spatial approach to territoriality – one that political ecology scholarship embraces widely (see e.g. Peluso, 2005; Bassett & Gautier, 2014; Foley & Mather, 2019; Raycraft, 2019). He defines the concept as an "*attempt* by an individual or group to affect, influence, or control people, phenomena, and relationships by delimiting and asserting control over a geographic area" (:19) (emphasis added). On the other hand, Raffestin ([1980] 2019), a Swiss geographer much influenced by Foucault's work on power, formulated a more relational approach to territoriality (*territorialité*). Hence to him, the concept

> "[…] reflects the multidimensionality of the territorial experience by the members of a community, by societies in general. People experience both the territorial process and the territorial product through a system of existential and/or productivist relations. Whether they are existential or productivist relations, they are all relations of power in the sense that there is interaction between actors who seek to modify both the relations with nature and the social relations. The actors, without wanting to and without knowing it, also modify themselves. Power is inevitable; it is not innocent either; it is in fine not possible to foster any relationship with impunity without being marked by it" Raffestin ([1980] 2019:no page number; own transl.).

As noted by Murphy (2012), such a framing of territoriality brings matters of everyday power relationships into analyses of the sociopolitical production of territories, and

> "[…] offers a way of ensuring that we do not become overly focused on the spatial outcomes of those territorial projects, but instead recognize how the complex interactions, material circumstances, and ideological norms of the sociospatial milieu in which they are embedded help to produce those spatial outcomes in the first place" (:169).

Combined with Sack's spatial approach to territoriality, Raffestin's emphasis on power and intertwined socio-natural relations seems particularly well-suited for political ecological analyses of territorialization processes (see also Bassett & Gautier, 2014). Indeed, not only are human-non-human nature relations being reworked by contemporary processes of territorialization, but all the more so are power relations among social groups (Corson, 2011), whereby resource access, control, and management unfailingly shifts from the poor to the powerful (Bassett & Gautier, 2014:2). The preceding thus allows, in the words of Campling and Colás (2017),

> "[T]he fertile interaction between 'territoriality' as a relation (or transitive verb), and 'territory' as a thing (or noun), [with] the former denoting the wider range of strategies aimed at producing and regulating space(s), [and] the latter referring to a more specific bounded space, of which the sovereign territorial state has been the dominant form in the modern period" (:3).

For another, crucial for the making of conservation territories, is the process of boundary-making (see e.g. Raycraft, 2019). Conservation indeed constitutes "an attempt both to delineate and maintain a boundary in space and to arrest time in the interests of a supposedtly pristine nature which, of course, is neither bounded nor static" (Katz, 1998:54). As such, conservation boundaries "spatially reify the nature-culture dichotomy" (Roth, 2008:375) much decried by political ecologists, and fix socioevironmental conditions (Harvey, 2001; see also Bakker, 2009), thus contributing to processes of "sociospatial structuration under capitalism" (Brenner, 2001:593). What is more, boundary-making then serves the combined functions of policing, exclosure, and containenement, whereby the boundaries of conservation areas are used to control people and criminalize resources users (Zimmerer, 2000:362). As Robbins (2019) stresses, "conservation is *always* linked to control" (:169; emphasis in the original), and to delimit indeed, is "to momentarily isolate or abstract or even to manifest a power over a precise area" (Raffestin, [1980] 2019:no page number; own transl.).

The territorialization of marine space(s) is particularly evidenced in the promulgation and establishment of MPAs (Chmara-Huff, 2014; see also Raycraft, 2019), constituting what Vandergeest and Peluso (1995) describe as the "internal territorialization [by the State] in

establishing control over natural resources and the people who use them" (:385). The term "internal" is here important, in that such a territorialization process is taking place *within* State territory. Crucially, however, the territorialization of conservation space(s) through MPAs cannot be dissociated from the process of scaling (see e.g. Green, 2016), and thus from the concept of scale. Indeed, "scale is central to today's conservation boom" (Zimmerer, 2000:360; Zimmerer & Bassett, 2003).

3.4. Scale and the "politics of scale" of metaphor

Scale is central to political ecology and the study of a "politicized environment" (Bryant & Bailey, 1997; see also e.g. Paulson et al., 2003). Already in their seminal work *Land Degradation and Society*, Blaikie and Brookfield (1987) called for "crucial considerations of geographical scale and the scale of social and economic organization" (:13) as part of their famous "chain of explanation" of society-environment interactions, whereby land managers, other groups within the society they are part of, the state, and eventually the world economy, constituted the four respective hierarchical scales of interest (Blaikie & Brookfield, 1987:27). The element of scale in political ecology is in that regard important, as it allows for the study of "phenomena manifest in one or more specific geographic locales, together with that of nonlocal arenas of power and decision-making, to identify relations and influences between these spaces" (Paulson et al., 2003:210). The failure, particularly, to recognizing cross-scale interactions, as such constitutes the most recurrent "scale challenge" (Cash et al., 2006).

As part of this study, I find it especially relevant to engage with the "scale issue" (Meentemeyer, 1989) given its importance vis-à-vis marine commons (see Berkes, 2006). As underlined by Zimmerer and Bassett (2003), "diverse environmental processes interact with social processes, creating different scales of mutual relations that produce distinctive political ecologies" (:3), not least in the marine environment. In the context of fisheries notably, one must therefore assume any given resource management system – not least co-management systems – to be multi-scale, thus calling for it to be managed at different scales simultaneously (Berkes, 2002; 2006), and indeed paying closer attention to political economic land- and seascape – or "national and international agendas, regimes, networks, and legal systems" – such management systems are nested within (Adger et al., 2005:2; see also Jentoft et al., 2007). This, indeed, is why political ecologists often advocate studies articulating local social-ecological processes

together with regional and global drivers (Paulson et al., 2003:205). Hence, perhaps best formulated by Sayre (2015),

> "Scale is evidently an inherent feature of political ecology, at the very least because the political organization of today's world is fundamentally territorial – organized into discrete, bounded geographical spaces – whereas both ecological and economic processes routinely exceed or defy these boundaries, … [and] modern polities depend on and produce scales in myriad ways" (:505).

As such, the issue of scale is best seen as central particularly, to what Zimmerer and Bassett (2003) describe as a "geography-centered political ecology" or a "geographical political ecology" (:2), which focuses on the *spatial* scale, and which I deem appropriate for describing the kind of political ecological text unfolded in this study.

The concept of scale nonetheless has multiple meanings – it is yet not the purpose to here delve into all its possible meanings (for an overview see e.g. Marston, 2000). Noteworthy, Sayre and Di Vittorio (2009) distinguish three distinct conceptualizations of scale, namely scale as size, scale as level, and scale as relation. The latter, also known as the operational scale – consisting of processes interacting across scales-as-levels and relations between scales, is concerned with scaling effects, cross-scale interactions, and scale mismatches (Sayre & Di Vittorio, 2009). Sayre (2015) particularly distinguishes the operational scale from the observational scale, whereby "the former are real attributes and of phenomena in the world, whereas the latter are epistemological tools, chosen and applied by the observer, to make sense of those phenomena" (:507). Scale can furthermore be spatial, temporal, or jurisdictional (Cash et al., 2006). Aware of the pitfalls particularly of decoupling space-times linkages in the planning and practice of conservation (see Zimmerer, 2000:364), the focus is in this study first and foremost on the spatial domain of scale. Following Newstead et al. (2003) – and with the aim particularly to apply the concept in the analysis of territorialization processes, I as part of this study thus envision scale as "the temporary fixing of the territorial scope of particular modalities of power" (:486; cited in McCarthy, 2005).

From the 1990s onwards, debates around the scale issue have been – particularly following the seminal writing by Neil Smith (1992) *Geography, Difference, and the Politics of Scale*, fed mainly by human geographers (see e.g. Swyngedouw, 1997; Marston, 2000; Brenner, 2001; Swyngedouw & Heynen, 2003; Mansfield, 2005). Yet as noted by McCarthy (2005), "geographers have no copyright on the politics of scale" (:732). The metaphor, which has

indeed been widely integrated by political ecologists (see e.g. Neumann, 2009; Zulu, 2009; Green, 2016), in essence asserts that "the production of scale may be the most elemental differentiation of geographical space and [that] it is every bit a social process" (Smith, 1992:73). Or as Brenner (2001) put it, the catchphrase summarizes "the proposition that *geographical scales and scalar configurations are socially produced and politically contested* through human social struggle rather than being pregiven or fixed" (:604; emphasis added).

Important is here, I believe, to somewhat further clarify the politics of scale metaphor. In this regard, the position of Brenner (2001) on the two different meanings the metaphor can in his view take seems worth being mentioned. Hence, to him in a first sense, "The notion of a politics of scale denotes the production, reconfiguration or contestation of some aspect of sociospatial organization within a relatively bounded geographical arena… [whereby]… scale is understood essentially as a boundary separating the unit in question" (Brenner, 2001:599) (emphasis added). In a second sense, however,

> "The notion of a politics of scale refers to the production, reconfiguration or contestation of particular differentiations, orderings and hierarchies among geographical scales… [whereby]… the referent here is thus *the process of scaling through which multiple spatial units are established, differentiated, hierarchized and, under certain conditions, rejigged, reorganized and recalibrated in relation to one another* (Brenner, 2001:600) (emphasis added).

Favoring this second sense, Brenner (2001) embraces a process-based understanding of the politics of scale metaphor – an understanding he summarizes as a "politics of scalar structuration or, more simply, as a politics of scaling" (:605) (see also e.g. Swyngedouw, 2000; Green, 2016).

Although I follow here Brenner's process-based understanding of the "politics of scale" metaphor, I believe the aforementioned distinction he operates with regards to the latter begs for a note. It is, following McCarthy (2005), indeed "impossible to separate out the delineation of any single scale (Brenner's first sense) from relationships among scales (his second sense). Politics at or about a given scale are inseparable from politics concerning relationships among scales" (:738). Furthermore, while Brenner (2001) sees the "specifically scalar dimensions of social spatiality" as being distinct from "the production of environment/nature" (:593), I am more inclined to think like McCarthy (2005), who finds "this sharp separation an unconvincing division, one that rests on an underlying and unstated dualism between society and nature" –

the very dualism political ecology scholarship opposes, in contrast to which he argues that "the contested production of socionatures is inseparable from the contested production of scaled social spatialities" (:735).

The "politics of scale" metaphor particularly gained traction vis-à-vis analyses of globalization, and particularly scalar tensions between the local and global, which Swyngedouw (1997) famously dubbed "glocalization" – i.e. "a shift away from the dominance of national scale arrangements and toward organization at both local/regional scales and international/global scales" (Brown & Purcell, 2005:611). This process in the unfolding of social-environmental issues constitutes a cornerstone object of scrutiny within political ecology (Keil, 1998). It was, in the context of an analysis of marine conservation scalar narratives at the CBD, for instance underlined by Gray et al. (2014).

> "The evolution of environmental governance in recent decades can be characterized by processes of rescaling: scaling down from states to local levels of government; scaling up from states to international institutions, agreements, and networks; and scaling out from centralized to inclusive, participatory decision-making processes" (Gray et al., 2014:68).

This process of "rescaling" – inherent to that of "glocalization" (Swyngedouw, 1997; 2000), has however been questioned. Mansfield (2005) for instance, who nuances the decline of the national – or "the 'hollowing out' of the national state" (Swyngedouw, 2000:69), sees the national as "constitutively implicated in other scaled activities", an important "dimension of political economic practice", and underlines that "it is in multiscaled interactions that the national gains its significance and gives significance to other scales and territorial formations" (:460). Echoing McCarthy's (2005) inquiry as to "who produces scale, how, and for what purposes?" (:733), she for instance notes that

> "A more interesting question is to ask about the ways (i.e., through what processes and for what reasons) different scales are produced and given significance at any particular time and/or place. This encompasses shifts over time and interactions among scales, but it also allows us to capture the complexity of multiscalar processes. This complexity is not captured in the idea of rescaling, but rather in the idea of scales as dimensions of particular events and processes" (Mansfield, 2005:468).

Bearing in mind, given its relevance to the case under study, Mansfield's take on the sustained importance of the national domain, let us come back to political ecology, where the "politics of scale" metaphor (Smith, 1992) during the 2000s evolved into that of the "political ecology of

scale" – a means to advancing Smith's metaphor by "demonstrating the central importance of ecological scale in shaping political-ecological dynamics" (Zimmerer & Bassett, 2003:4). As formulated by Neumann (2009), "this approach incorporates the key precepts of the politics of scale – scale as socially constructed, relational, contingent, and contested – into an existing framework that highlights power relations and a dialectical approach toward nature-society relations" (:404). Of particular interest to the case under study is how power dynamics are both shaped by, and in turn shape natural resource management scales (see Green, 2016:89), i.e. the operational scale (Sayre, 2015). Actors indeed change the ways they exert power and authority by operating at different spatial levels, using scalar choices as means of inclusion or exclusion that alter people's access to natural resources (Lebel et al., 2005:1). "The scaling of conservation occurs through the intermixing of social actors and institutions across a gamut of geographical areas that is conspicuously far-flung", Zimmerer (2000) underlines; a scaling "created through the 'containing in space' of practices and people by the use of political power" (:361).

In "scaling" or – "rescaling" (Swyngedouw, 2000; Green, 2016), the governance of, and solutions to ecological problems in certain ways, States for instance, can promote certain kinds of interventions whilst foreclosing others (Boyle, 2002:191). As such,

> "Scale and scalar configurations are not an independent variable that can cause outcomes, rather they are *a strategy used by political groups to pursue a particular agenda*. Therefore, the social and ecological outcomes of a given scalar arrangement are not to be divined in the scales themselves, but in the political agendas of the actors and organizations that produced and are empowered by the arrangement" (Brown & Purcell, 2005:608) (emphasis added).

Scale thus, rather than being a mere fact awaiting discovery, is a way of framing conceptions of reality (Delaney & Leitner, 1997:95).

The scale issue seems in my view therefore particularly relevant with regards to the fisheries management/conservation interventions that MPAs constitute. Ecological projects are indeed fundamentally being produced by, and implicated in the structuration of scale (Boyle, 2002:172). As underlined by Gray et al. (2014) "not only can MPAs be created and governed at multiple scales, but they can also support multiple, sometimes conflicting scalar narratives (about the appropriate scale at which to conceptualize marine conservation problems and solutions)" (:79). Such scaled places and spatially defined conservation units thus come to exemplify the scalar politics that are more often than not underpinning natural resource

management and conservation (Zimmerer & Bassett, 2003:7). In this context, “the governance of environmental scaling (who has the power to decide the ‘scalar’ constitution of ecological problems) then becomes a site of conflict in itself” (Boyle, 2002:192). Or as Smith (1992) put it, “the scale of struggle and the struggle over scale are two sides of the same coin” (:64).

4. Methodology

This chapter describes the methodology adopted, and the related choices made for the conduction of this research. The chapter hence first outlines the research strategy, design, and study area selected (subsection 4.1.), before presenting the data collection (subsection 4.2.) and analysis (subsection 4.3.) processes. Challenges encountered and limitations are then being presented (subsection 4.4.), and the chapter concludes with ethical considerations (subsection 4.5.).

4.1. Research strategy, design, and study area

This first section describes the research strategy – qualitative research (subsection 4.1.1.) and research design – the case study design (subsection 4.1.2.) adopted as part of this research process, as well as the study area of choice – Joal-Fadiouth and the JFMPA (subsection 4.1.3.).

4.1.1. Research strategy – qualitative research

As a research strategy, qualitative research commonly emphasizes words rather than numbers quantification in both the collection and analysis of data (Bryman, 2012:380). Qualitative studies indeed often rely on non-numerical data, such as texts, journals, images, audio and video recordings, and observation of behavior (Kanazawa, 2018:43). The distinctiveness of qualitative research does however not reside in the mere absence of numbers, and qualitative researchers more often than not emphasize for instance seeing through research participants' eyes, and description and context (Bryman, 2012:380). To this end, qualitative researchers often conduct their research at particular locations or sites with the aim of studying the individuals and communities living there (Stewart-Withers et al., 2014:2). In light of the nature of the research objectives and questions formulated in chapter 1, which much emphasize consideration for perceptions among fisherfolk, a qualitative research strategy is deemed pertinent for this study.

4.1.2. Research design – case study design

In the words of Bryman (2012), "a research design provides a framework for the collection and analysis of data" (:46). Yin (2018) furthermore describes a research design as "*a logical plan for getting from here to there*, where *here* may be defined as the set of questions to be addressed, and *there* is some set of conclusions about these questions" (:66; emphasis in the original). The research design adopted for this master's thesis is the case study design. Following Yin (2018) again, "a case study is an empirical method that investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (:50). The case study design is deemed particularly suited to this research given its holistic view of analyzed processes – bear here in mind the scaling and territorialization processes mentioned under chapter 3. As Gummesson (1988) argues, "[t]he detailed observations entailed in the case study method enable us to study many different aspects, examine them in relation to each other, view the process within its total environment and also use the researchers' capacity for 'verstehen'", i.e. *understand* (:76; cited in Meyer, 2001).

As part of this research, the very case under scrutiny is the JFMPA, which was selected based on the rationale motivating the conduction of this the study, but however also due to its accessibility to me – note that this "accessibility" has nonetheless been somewhat altered by the COVID-19 pandemic. The preceding begs for further clarification apropos the case selection process. As part of my part-time position as a Marine Project Assistant with GRID-Arendal[16] along my master's studies at Noragric, I was during the early spring of 2020 in charge of drafting an online communication product on participatory seagrass mapping activities that took place in the JFMPA in 2012, in a joint effort between the JFMPA Management Committee (more detail on the Management Committee under subsection X further down) and practitioners from the MAVA Foundation[17]. It is in this context that I have first gotten to know and exchange with Abdou Karim Sall, the President of the Management Committee of the JFMPA[18], by

[16] GRID-Arendal is a non-profit environmental communications center based in southern Norway, which is closely collaborating with UN agencies – not least UN Environment, regional organizations, and national governments, including in West Africa and Senegal.

[17] Former International Foundation of the Banc d'Arguin (FIBA, *Fondation Internationale du Banc d'Arguin*), the MAVA Foundation for nature is a Swiss-owned environmental NGO. The MAVA is currently one of the most important donors involved in coastal and marine conservation across West Africa.

[18] Karim is also the Secretary General of the interprofessional organization of Joal's fish-landing site, City Councilor for the Fisheries and Environment Committees, President of the Platform for Artisanal Fisheries Actors

means of a video call for the collection of background information for the document I was in charge of drafting. Karim would later become central to both my research and its conduction in Senegal, where fieldwork led me.

Indeed, for several months during 2020, a trustful relationship was developed between Karim and I through sustained exchange over WhatsApp. Having at the time already broadly defined the avenues I would like to investigate as part of the present master's thesis – namely lifting the lid off the political economic underpinnings and impacts on artisanal fisherfolk of the widespread implementation of MPAs along the West African coastline, it occurred to me that the JFMPA could constitute a very relevant and interesting case to study. Aware of my research interests, Karim kindly agreed to host me with his family for the entire duration of my work in exchange for financial compensation. He also expressed that he could, where necessary, facilitate my access to key informants – ensuring that good access to data will be possible is indeed seen key in the selection of a case (Yin, 2018:65). In the following, I refer to Karim as my "gatekeeper". In social science research, often referred to as gatekeepers are, in the words of Campbell et al. (2006), "those who provide – directly or indirectly – access to key resources needed to do research, be those resources logistical, human, institutional, or informational" (:98). The aforementioned elements altogether motivated the selection of the JFMPA as the very case under study as part of this research.

4.1.3. Study area – Joal-Fadiouth and the JFMPA

Joal-Fadiouth lies on the Atlantic coast some 114 kilometers south of Dakar, capital city of Senegal, and just north of the Sine Saloum delta, in the Thiès region, Mbour district. The municipality was officially created in 1966 from the regrouping of three traditional *Sereer*[19] localities, the Joal peninsula, the island of Fadiouth, and the village of Ngazobil (Abdou Karim Sall, pers. comm.). Fadiouth is renowned for being an artificial island built upon the centuries-long accumulation of *senilia senilis* seashells (Badkhen, 2018:89), and constitutes an important touristic attraction. This village is mostly Catholic (90%), with Muslims constituting only 10% population, and is characterized by its remaining predominantly subsidence-oriented, non-motorized fishing activity (Abdou Karim Sall, pers. comm.). The locality of Joal, on the other

in Senegal (PAPAS, *Plateforme des Acteurs de la Pêche Artisanale au Sénégal*), and President of the West African MPAs.

[19] *Sereer* are one of the many ethnic groups the Senegalese population is composed of.

hand, predominantly Muslim, is first and foremost famous for being the birth place of independent Senegal's first president Léopold Sédar Senghor (in place from 1960 to 1980), who refers to the place in its early poetry works (see Senghor, 1961). While by the time Senegal gained sovereignty from French colonial powers in 1960 Joal was a village of some 5000 farmers (Badkhen, 2018:34), Joal-Fadiouth altogether is today home to a (projected) population of 56994 inhabitants (ANDS, 2013). The latter is mainly composed of allochthones, who have for most settled for, or around the multiple fishing-related activities taking place within the town.

Indeed, stretching on a thin strip of coastline and resolutely turned towards the ocean, Joal[20] is since the early 1990s all the more known as the most important artisanal fish-landing site in Senegal (Weissenberger et al., 2016:10), one of Joal's most lively and social places. Less than 10 during the mid-1960s (Abdou Karim Sall, pers. comm.), 1089 pirogues were counted in Joal during the latest census, conducted in 2019 (CRODT, 2020:12). The importance of the artisanal fisheries subsector in Joal is also reflected in the presence of two major artisanal fish transformation sites, *Khelcom* and *Tann*, which are both located at the eastern outskirts of the town. Near the fish-landing site are also established different factories, including an ice production factory – for fish conservation and transport, *Elim Pêche*, a South Korea and Senegal-owned export-oriented factory established in 2001, and *Omega Fishing* a South Korea-owned fishmeal and oil factory established in 2009.

Along with the other first four Senegalese MPAs, the JFMPA (figure 4) was officially established on November 4th 2004 following governmental decree n°2004-1408, with three objectives: conserving marine and coastal biodiversity; improving fishing yields; and improving the socio-economic benefits for the population (DAMCP, 2017). Its establishment was led by the Directorate for National Parks (DPN, *Direction des Parcs Nationaux*), and supported by the Senegalese/West African office of the WWF, through its West Africa Marine Ecoregion (WAMER) program (Leloup, 2011). Nested within a broader national and regional MPA network, the JFMPA in total spans over 17400 ha, which include the maritime dependencies of the municipality, tidal marshes – e.g. the Mama Nguedj tidal marsh between

[20] Joal-Fadiouth is in Senegal often simply referred to as 'Joal'. Besides when spelling out the full name of the MPA, I do so myself in the following, as indeed my research has only focused on Joal and the motorized artisanal fisheries subsector operating from that part of town, and not on Fadiouth.

Joal and Fadiouth in which many woman organized in professional associations harvest different bivalve species, and an important mangrove forest area (DAMCP, 2017).

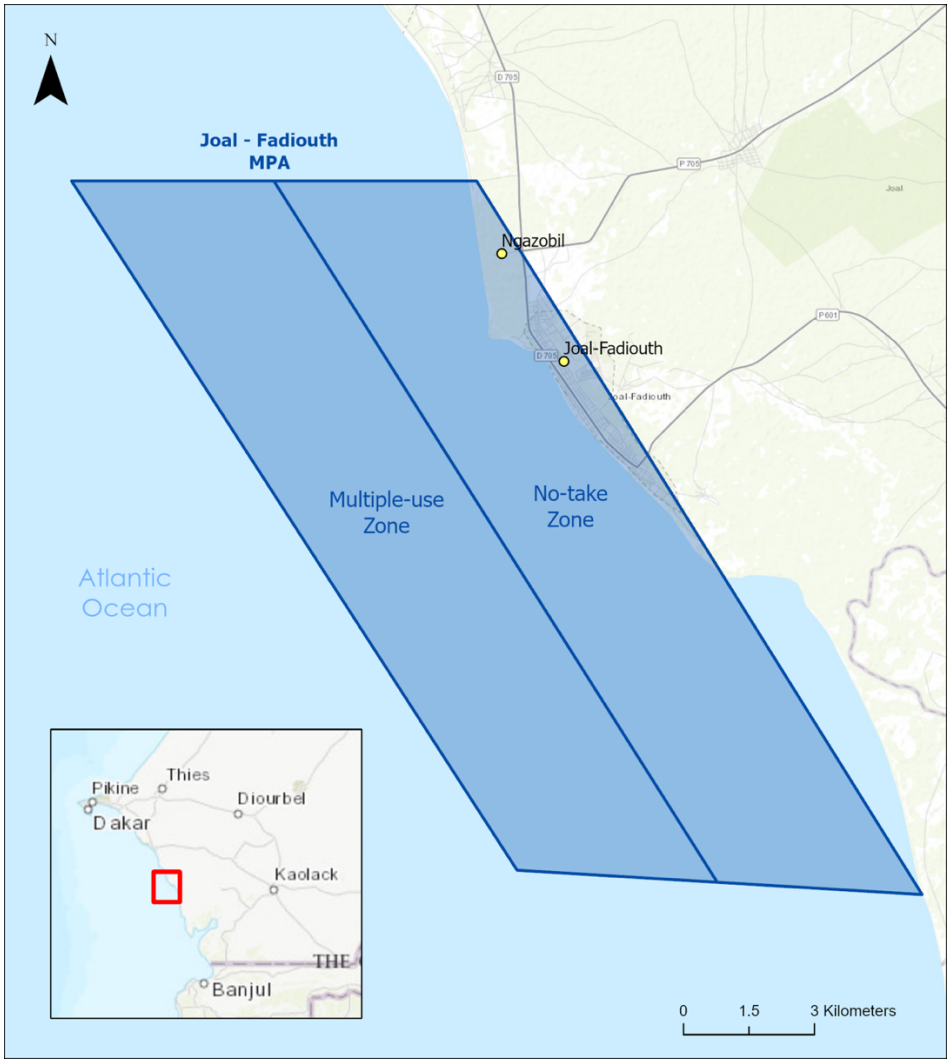

Figure 4: Joal-Fadiouth MPA (Service Layers : ESRI; Here, Garmin, NGA, USGS; ProtectPlanet).

In terms of marine and coastal biodiversity, the JFMPA further constitutes a spawning ground and reproduction site for sea turtles, which migrate between Guinea Bissau and Mauritania (Diouf & Sané, 2020:29). The JFMPA also seeks to conserve manatees and dolphins (DAMCP, 2017), as well as seagrass habitats. Two seagrass species are in that regard identified off Joal, *cymodocea nodos*a and *hallodule wrightii* (Pergent & Diop, 2009), which both constitute important habitats particularly for green turtles and cuttlefish (Diouf & Sané, 2020:17). The seagrass beds in the area are found between one and six meters deep, and are entirely subtidal, and not uncovered at low tide (FIBA, 2014:8). Despite a lack of sound information about fish assemblage composition, structure and dynamics within the JFMPA until 2015, over the period

2015-2016, bonga shad (*ethmalosa fimbriata*), Senegal seabream (*diplodus bellottii*), bastard grunt (*pomadasys incises*), and flagfin mojarra (*eucinostomus melanopterus*) were the most represented species within the JFMPA (Diankha et al., 2019:7). In 2017, 68 species belonging to 34 families were listed in the JFMPA, with bonga shad, mullet (*liza dumerili*), and flagfin mojarra being the most abundant species in terms of total biomass (Diankha, 2018:24).

As a governing system (see Jentoft et al., 2007), the JFMPA constitutes a co-management arrangement between the fisherfolk community and the Senegalese State (AMPJF, 2010). Set up in 2006, the Management Committee is the executive body of the JFMPA, and its main decision-making body. It is the Management Committee that discusses issues pertaining to the participatory management of the JFMPA, including ecological monitoring, the application of sanctions and fines, as well as project proposals submitted by donors and environment NGOs (Diouf & Sané, 2020). The Management Committee is composed of 25 parties representing the population in the co-management arrangement (Abdou Karim Sall, pers. comm.). The administration of the JFMPA, on the other hand, is under the DAMCP, represented by one conservationist – the administrative authority – and his team – officers and non-commissioned officers in uniform (Diouf & Sané, 2020:47). The administrative team of the JFMPA last rotated in November 2020.

At sea, the zoning is within the JFMPA spatially arranged as follows:

- The no-take zone, which from the northern to the southern MPA boundaries extends from the coastline to 4.5 km offshore. This zone is strictly forbidden to any fishing activity.
- The multiple-use zone, which from the northern to the southern MPA boundaries as well, extends from the outer boundary of the no-take zone to the outer boundary of the MPA 9 km offshore. In this zone, only responsible fishing and fishing gears that comply with the norms foreseen by texts in force are allowed.
- The mangrove and tidal marshes zone inland. In this zone, conservation and development activities can be associated. This zone embraces for instance arch seeding areas and oyster beds, and ecotourism activities are authorized as well. (Prefecture of the Department of Mbour, 2006; FIBA, 2014).

In light of the above zoning, the JFMPA constitutes an IUCN category VI MPA. Bearing this succinct description of the study site in mind, I in the next section describe the data collection as it unfolded as part of my research process.

4.2. Data collection

This second section describes the data collection as unfolded as part of the overall research process outlined in this chapter. The primary data used as part of this study was – as already briefly touched upon under subsection 4.1.2., collected during fieldwork in Senegal. While my stay in the country lasted 12 weeks from February 23rd to May 23rd 2021, around 7 weeks were over this period spent in Joal, and 5 weeks in Dakar and other cities, based on data collection-related contingencies – and sociopolitical events. As such, this research is in my view best described a multi-sited ethnographic work, which acknowledging that a single study site cannot be seen "the container of a particular set of social relations", in essence endeavors "to follow people, connections, associations, and relationships across space (because they are substantially continuous but spatially non-contiguous)" (Falzon, 2016:1-2). Divided into two subsections, the section in detail describes the sampling procedures (subsection 4.2.1.), as well as the data collection methods – i.e. semi-structured interviews, photovoice focus groups, and observation and secondary sources – and associated technical procedures (subsection 4.2.2.) adopted for the conduction of my research.

4.2.1. Sampling procedures

Martínez-Mesa et al. (2016) define sampling as "the process through which individuals or sampling units are selected from the sample frame" – i.e. "the group of individuals that can be selected from the target population given the sampling process used in the study" (:327). In qualitative research, not only is the sampling process important for exemplifying the population under consideration (Bryman, 2016:409), but also to enable analytic generalizations – one of the very aims of case study research particularly (Yin, 2018:79), which more often than not motivates the use of non-random sampling approaches (Onwuegbuzie & Collins, 2007:283). Exactly such a non-random, purposive sampling approach – i.e. snowball sampling – was applied as part of this research process, as a strategic means to sample participants with the aim to ensuring their relevance to the objectives and research questions (Bryman, 2016:408), as formulated in chapter 1. Noteworthy, purposive sampling being a non-probability form of

sampling, the technique does not allow for generalizing findings to a larger population (Bryman, 2016:409), i.e. statistical generalization (Yin, 2018:58). The goal is, instead, to get insights into, and a sound understanding of a phenomenon and individuals (Onwuegbuzie & Collins, 2007:287), and to echo the latter with existing theory and research (Yin, 2018).

Snowball sampling hence, is a technique where a first sampled participant or group of participants suggest others who would be relevant to the research (Bryman, 2016:415). For this study, the "snowballing" of participants started somewhat concurrently from two different individuals particularly: my gatekeeper Karim, and Dr. Marie-Christine Cormier-Salem, a French social-anthropologist who conducted extensive field research among Senegalese artisanal fishing communities, and who following a brief informal email conversation, provided me with the contact information of two Senegalese researchers, respectively fisheries biologist and social-anthropologist. In addition, I was also provided contact information from other future study participants by a former colleague at GRID-Arendal. The preceding, in my view, allowed me to approach my sampling process through multiple angles, thus preventing me from fully locking myself into what one might envision a form "path-dependency" in snowball sampling.

For the purpose of this research, a number of sample categories were decided upon before reaching the study site, and later refined once fieldwork started. Different sample categories were decided upon for the two main data collection methods – semi-structured interviews and photovoice focus groups. For semi-structured interviews, first, six sample categories were decided upon (see table 3), with the aim to get as broad a set of perspectives as possible vis-à-vis the research objectives and questions formulated under chapter 1. The broad categories decided upon were the following: artisanal fishers, divided into subsamples based on the predominantly used fishing gear; fishmongers; fish processors; researchers, NGO representatives, and fishers' union and local fishing institutions representatives; and private sector representatives – men only. Note that while some environmental NGO representatives were recruited based on their current affiliation, others were also recruited based on previous affiliations and their past involvement in the JFMPA, with the aim of getting a more fluid time perspective. Across sample categories, a total of 79 participants was recruited and 82 interviews were conducted – some participants were interviewed more than once and some were interviewed in pairs.

Table 3: Sample categories for semi-structured interviews

Sample categories	Number of recruited participants
(1) Fishers – and ex-fishers	28
(2) Fishmongers	16
(3) Fish processors	3
(4) Researchers (CRODT; IRD; Thiès University), fishers' union and local fishing institution representatives, and NGO representatives (ADEPA; CAOPA; Greenpeace Africa; Wetlands International Africa; RAMPAO; ex-WWF)	8 4 8
(5) State representatives (DAMCP) and JFMPA Management Committee members	4 6
(6) Private sector representatives (fish processing and fishmeal factories)	2
Total	**79**

Note: recruited participants are in this table counted as belonging to a single sample category – the category as part of which I recruited them, although several participants fitted multiple sample categories. Not least among fishers and fishmongers, many participants happened to also be representatives of associations, unions, or other local institutions.

Other sample categories were furthermore decided upon for the photovoice focus groups. With the aim of giving fishers particularly, a strong voice in this study, fishers constituted the sole population under consideration as part of the photovoice method. As such, photovoice focus group sample categories were fishers' predominantly used fishing gear at the time of the fieldwork (see table 4). A total of 20 participants were recruited for the photovoice method. While I acknowledge here the important overrepresentation of fishers in my overall sample across data collection methods, I deemed this overrepresentation justified by this study's motivation, objectives, and research questions.

Table 4: Sample categories for photovoice focus groups

Sample categories	Number of recruited participants
Set gillnets	2
Fish traps	5
Handlines and squid jigs	2
Longlines	3
Drift gillnets	8
Total	**20**

Snowballing constituted the prevailing sampling approach for interviews at what I would describe as the "institutional level" – sample categories 4-6 (table 3), where initial contact with participants was generally made directly over the phone and in fewer cases over email. Beyond snowballing, sampling at the "non-institutional level" – sample categories 1-3 (table 3), also

came, as realistically expected, to be guided by convenience – or constraint depending on one's perspective. Also referred to as opportunistic, a convenience sample is, in the words of Bryman (2016), "one that is simply available to the researcher by virtue of its accessibility" (:187). It is in ethnographic research not uncommon for study participants to be recruited following a combination of convenience and snowball sampling (*ibid*).

Indeed, while I had been able to define the sample categories independently, I was in Joal – not least due to my position as a non-Wolof-speaking foreign researcher[21], not in full control of the recruitment of participants at the non-institutional level. My first round of interviews with fishers for instance, was "organized" by my gatekeeper, who based on the sample categories I had decided upon, took me to the homes of selected fishers in his neighborhood. This also provided some explanation as to why I have at times unintentionally interviewed ex-fishers, rather than fishers in activity. Given yet the title(s) and associated social status of my gatekeeper, and my research revolving notably around intracommunity power differentials over access to, and use of marine resources, I was concerned my informants would all share a similar line of thought as Karim, or at least tailor their answers to my interview questions according to his views. This, I found out early, was not the case. Many fishers I interviewed upon recommendation of my gatekeeper did indeed express some fairly critical opinions vis-à-vis the JFMPA (see chapter 5).

Nevertheless, I must mention that following about a month at my field site in Joal, a form of discomfort arose in me vis-à-vis my lack of independence from my gatekeeper with regards to accessing new informants at the non-institutional level. I was however, once my face more familiar to many – at least in the neighborhood where I lived and at the fish landing site where I did spend much time, able to start recruiting participants more "independently". This was not least facilitated by the help of two researchers from CRODT, who following my interview with them, kindly offered to assist me recruiting fishers and fishmongers for interviews at the fish landing dock – during which they also supported me with language interpretation. This proved timely, also given the fact that my main interpreter was not always available since also very much held off by her own work with my gatekeeper and their work with two of the many environmental NGOs operating in Joal – *Océanium* and *Agir*.

[21] While French remains the official language in Senegal, Wolof traditionally is the language spoken most among artisanal fisherfolk, including in Joal.

As for photovoice participants, these too, were recruited through combined snowball and convenience sampling. Some had already participated in interviews, thus allowing me to start building a relationship with them, which I deemed important given the "commitment" required with the photovoice method – relationship-building is nonetheless crucial in the context of qualitative research as a whole (Stewart-Withers et al., 2014). Others were recruited again following advice from my gatekeeper as well as from other fishers. Unfortunately, due to some misunderstandings, no fishers working on a purse seiner were recruited (see table 4), although this originally was a planned sample category for photovoice, in order to get as good a representation as possible of the different types of fishing gears in use among fishers operating from Joal. This unfortunate sampling mishap – which resulted in an overrepresentation of trap fishers, and drift gillnet fishers particularly, among photovoice participants (see table 4), was only to be noted once the focus group discussions initiated. A more detailed description of the aforementioned data collection methods employed as part of this research is being advanced in the following subsection.

4.2.2. Data collection methods and technical procedures

The collection of primary data was as part of this research chiefly conducted through semi-structured interviews. Significant and rich data was furthermore collected through photovoice focus group discussions. Qualitative interviewing and focus group discussions constitute two of the main research methods associated with qualitative research (Bryman, 2016). Furthermore, although not initially planned as such, observation constituted a third data collection method. Last but not least, gray and scientific literature, as well as raw data provided by informants working for different national and local institutions in Senegal eventually constituted a fourth and last source of data. Combining multiple data collection methods and sources of evidence is important for triangulation – i.e. the combination of multiple forms of data with aim to addressing potential validity issues in each (Berg & Lune, 2012), and constitutes one of the core characteristics of case studies (Yin, 2018:55). Each of the aforementioned data collection methods is in the following being described in detail, with a brief reflection upon their use and a word on encountered challenges. Specific technical procedures associated with each method are noted as well.

4.2.2.1. Semi-structured interviews

Also referred to as in-depth interviews, semi-structured interviews constitute a flexible interviewing process built around an interview guide that is tailored to the research objectives and questions formulated by the researcher(s) (Bryman, 2016:468-469). While questions asked might in semi-structured interviews lightly differ from those formulated on paper, all essential aspects are normally being addressed (Bryman, 2016:468). Given the importance, for assessing and guiding the implementation of natural resource management and conservation interventions such as MPAs, of taking into consideration – particularly local – people's perceptions (see e.g. Daw et al., 2011; Leleu et al., 2012; Bennett, 2016; Bennett et al., 2019), semi-structured interviews, which put much emphasis on the interviewee's point of view and perception(s) (Bryman, 2016:466), were for this study deemed well-suited as the main data collection method.

Ranging between around 10 and 120 minutes – for the shortest and longest respectively, the semi-structured interviews were conducted at multiple locations, based first and foremost on the interviewees' preference and convenience. In Joal, interview locations included: the beach, and the small shelters[22] thereupon, where fishers often rest, conversate over some mint tea, or fix their fishing gear when not busy at sea; fishers' homes; the fish landing dock; one of Joal's two artisanal fish processing sites – *Khelcom*; and different offices, including those of the JFMPA and the aforementioned Senegalese environmental NGO *Océanium*. Besides in Joal, interviews with participants recruited as part of sample category 4 particularly, were conducted in the cities of Dakar, Hann, Mbour, Ngaparou, and Thiès, in locations as broad ranging as public offices (e.g. research institutions and university campuses, environmental NGOs facilities, etc.) personal homes, and a restaurant. Indeed, I tried as much as possible meeting interviewees physically, since a human face-to-face setting in my view allowed for a more open exchange than phone, or even video calls. That being said, three interviews needed be conducted online, in these cases using *Zoom*. With the permission of my study participants, all interviews were recorded, using either my personal mobile phone or a small audio recorder. Interviews at the institutional level were all conducted in French. For interviews at the non-institutional level, I would – although some were conducted in French as well, generally be accompanied by someone providing interpreting assistance.

[22] *Mbaal* in Wolof.

4.2.2.2. Photovoice focus groups

Photovoice is a form of participatory action research that came into being during the early 1990s at the nexus of empowerment education, feminist theory, and documentary photography, in the context of research conducted by Caroline C. Wang and Mary Ann Burris on reproductive health education for women in rural China (Wang & Burris, 1994:172). A qualitative research method, photovoice enables people, once being given a camera by the researcher(s), to create photographs and discuss them either individually or in small groups such as focus groups[23], with the aim of documenting the reality of their lives and to reflect on the assets and self-defined concerns of their community[24] (Wang et al., 1998; Wang & Redwood-Jones, 2001). The very acronym "voice" in "photovoice" indeed stands for "voicing our individual and collective experience" (Wang & Burris, 1997:381). Initially coined *photo novella* – i.e. "picture stories", photovoice as formulated by Wang and Burris (1994), "provides participants the opportunity to spin tales about their everyday lives" (:179). This in turn, promotes the production of shared and critical knowledge intended at informing policy-makers about the specific needs of people (Wang et al., 1998; Wang & Redwood-Jones, 2001).

With photovoice, hence, photographs constitute a form of code that reflects the "community" back upon itself, thus mirroring the everyday sociopolitical realities that shape people's lives (Wang & Burris, 1994:172). Cameras are indeed being handed to people who would normally not have access to such devices, with the aim for them to record and discuss changes in their lives, rather than merely being treated as passive subjects of other people's intentions (Wang & Burris, 1997:371). Positioning participants both as participants *and* co-researchers (Latz, 2017:3), photovoice thus is a methodology that has the potential for capturing stories that diverge from dominant narratives, and which has historically indeed been used to shed light upon the experiences and perspectives of marginalized people whose voices remain unheard by those in power (Latz, 2017:3-5). For this very reason, with in mind the intent to give artisanal fishers a voice, photovoice was, as a form of participatory research – which Hurley and Manel (2015) see "an important interactive process in knowledge syncretism by bridging the gap

[23] Stewart-Withers et al. (2014) define a focus group as "a group discussion of a particular issue where it is instructive to learn from the group dynamics and the way people discuss things as much as what they say" (:63).
[24] One must however be wary of the notion of "community" and the ways its use may lead to inappropriately overlooking the heterogeneity of individual lived experiences, not least vis-à-vis natural resources management (see Agrawal & Gibson, 1999; Jentoft, 2000).

between science, cultural knowledge and experiences of fishers" (:664), deemed particularly relevant to this thesis' research objectives and questions[25].

Photovoice has, since developed by Wang and Burris, been applied in studies in as wide-ranging research fields as education, public health, international development, parenting, or human displacement (Sutton-Brown, 2014:170). All the more relevant to this research, photovoice is also being applied in the context of environmental science, sustainability, and conservation (Derr & Simons, 2020:360). Informed by previous relevant research where photovoice has been applied to the study of social-ecological systems (see e.g. Berbés-Blázquez, 2012; Bennett & Dearden, 2013; Mahajan & Daw, 2016; Masterson et al., 2018), photovoice has as part of this research been used as a means to collecting visual representations of artisanal fishers' perceptions of, and in-depth qualitative data on social-ecological changes that are affecting their lives broadly, and livelihoods particularly. The method thus contributed as part of this research to shape a form of what Pink (2001) describes as "visual ethnography". The photovoice process as it unfolded as part of my fieldwork in Joal is described in detail in the following.

Though photovoice lacks a uniform procedure for implementation, a general framework exists, which when applied, allows for characterizing a study as utilizing photovoice (Sutton-Brown, 2014:171). As part of this research, the photovoice process was conducted following a series of steps that are commonly described in the photovoice methodology literature – although under different designations depending on the authors. For this research, followed loosely was the procedure described by Wang (1999), which normally includes the following steps: (i) select and recruit a target audience of policymakers or community leaders; (ii) recruit a group of photovoice participants; (iii) introduce the photovoice methodology to participants; (iv) obtain informed consent; (v) pose an initial theme for taking pictures; (vi) distribute cameras to participants and review how to use them; (vii) provide time for participants to take pictures; (viii) meet to discuss the photographs; (ix) plan with participants a format to share the photographs and stories with policymakers or community leaders (Wang, 1999). It must be noted that step (i) and (ix) were not included in the photovoice process for this research, and that other steps were merged – particularly steps (iii) to (vi).

[25] Note, however, that fisher participation – in broadly defined terms – does not necessarily lead to better outcomes for study participants and the research they part take in (see Silver & Campbell, 2005).

First – once the sampling procedure and sample categories decided upon, photovoice participants were called over the phone and invited to my gatekeeper's home for an introductory meeting to the photovoice methodology, its purpose, and my intent with its use as part of this research. While the original idea was to gather all 20 photovoice participants during a single introductory meeting in order to present the methodology to all at once, it proved challenging to bring all fishers together as one and only group – fishers have different availabilities depending on their fishing schedules, family chores, or private lives in general – simply "bigger fish to fry". Participants have hence been introduced to the photovoice methodology in smaller groups, and even individually for some of them. This first meeting was also the occasion for obtaining participants' informed consent. It was also at this moment that the main theme for the photographs to be taken by the participants was introduced for their understanding, namely to broadly capture social-ecological changes that they perceived to be affecting their lives, and livelihoods particularly. While this query might be seen rather broad compared to my research objectives, I must here note that this was intentionally done so, with the aim to not over-complexify the process, and to rather narrow down the scope later through questions during the discussions of the photographs in groups.

Once the photovoice method had been introduced, informed consent obtained, and the theme for taking the pictures clarified, cameras were handed out to the 20 participants, who all received a brief introductory training to their utilization. "Taking some time to provide participants with an overview of photography basics", Latz (2017) notes, "can prepare them to generate images that align with their purposes and intentions" (:70). The cameras that were handed out were *Fujifilm QuickSnap* disposable cameras, each with 27 exposures. These were brought from Europe, as I had been inclined to think that such cameras would not easily be available in Senegal. Not only more affordable than digital cameras, disposable cameras were also deemed a good means to limiting the number of pictures taken by each photovoice participant, in comparison to the former. The handed-out disposable cameras had a flash, which once activated, would allow participants to take pictures at night or in poorly lit interior, where deemed necessary. *QuickSnap* cameras yet unfortunately not being waterproof, the photovoice participants used either the pouch that they would normally safely store their electronic devices in (e.g. mobile phone, GPS), or wrapped their camera in a small plastic bag, in order to protect it from water. This proved to be important, since it was expected that the cameras would most likely spend some time at sea with fishers during their outings – it turned out all fishers indeed used their cameras at sea.

The time frame decided upon for participants to be using the cameras was set to 7 days, starting from the day following the introductory meeting. This rather short time frame was decided upon based on my own time constraints in the field, but also in order not to lose touch with the participants over a longer time frame. However, it proved quite challenging to get a hold of all the cameras exactly 7 days after they had been distributed. The time frame for participants to take their photographs in practice lasted anywhere between 5 days and 17 days, which unfortunately stretched the overall photovoice process more than what was initially planned – i.e. two weeks. One major element underpinning this discrepancy between planning and practice was that I was not myself directly in contact with most of the photovoice participants, but that my gatekeeper was, and that for reaching a minority of participants, other contact intermediaries needed be involved as well (e.g. friends or relatives). While these communication mishaps in some cases complicated the recovery of the cameras, I was first and foremost responsible, since I did not ask all photovoice participants for their phone numbers during the introductory meeting, and here perhaps relied too much on my gatekeeper for contacting them.

With regards to the recovery of the cameras, some were thus picked up by myself at participants' place of choice, while some were brought back where I lived by participants themselves. In the latter case, however, it was ensured participants would not in addition collect and bring back the cameras of others, in order to avoid any mixing up between cameras and the participants that used them – indeed I unfortunately did not mark the cameras before handing them out to participants but only after recovering them. Participants were hence invited to drop off their camera individually, or to wait for me to come pick it up. Despite minor hiccups around the recovery of the cameras, no camera went missing by the end of the picture-taking process.

Once collected, each and every camera was identified using a post-it and tape, and given the number of the participant who used it. In addition, once printed, each photograph was later given a code – a combination of the photographer's assigned participant number and the photograph's number – which was written on its back. These procedures together would ensure that: first, from being captured, to being processed at the lab, to being handed over to participants during focus group discussions, the matching of a given image with its author would always be possible; and second, it would later be possible to correctly match the audio recordings of the discussion and the transcribed and coded text bits with the pictures, during the analysis process.

While it would certainly have been ideal to process the films and print the photographs locally at the study site, this was unfortunately not possible, since none of the photography stores in Joal sustained their work with analog photography as a result of the "digital takeover". The films from the 20 disposable cameras were thus processed some 200 kilometers inland in Mbacké, near the holy city of Touba. Established in Mbacké, *Labo Tropic* is today the last remaining photo lab to be processing analog photography in Senegal[26]. There, the 20 films were processed over the course of one day, and the photographs printed with the strict minimum editing possible, in one copy to later be used as the basis for discussions during focus groups. A digital copy of each photograph was also created, in order to ensure the relevant photographs could later be included in the pages of this thesis.

In total, the 20 photovoice participants altogether took 460 photographs. It was however not possible for me to know whether participants had all used their cameras themselves – the taking of photographs by other people than those recruited is indeed not uncommon in photovoice research (Latz, 2017). As part of the described photovoice process for instance, one participant who had been given the camera and who had placed it in his pirogue ahead of his next fishing trip, was held-off from it in an impromptu manner. Faced with this setback, he forgot to remove the camera from the pirogue, and as he realized it, the latter had already left for a 13-days fishing trip off The Gambia. This participant thus called another crew member aboard, and gave him the necessary guidance regarding both the use of the camera and the idea underpinning the photovoice method for this research over the phone, for this other fisher to replace him as a photovoice participant. I was to discover this swap in participants only later at the beginning of a discussion over the photographs, when the participant who showed up was not to be recognized. In addition, other cameras probably also went into different hands aboard the pirogues on which photovoice participants operated, as these were in some instances on pictures themselves.

With regard to the discussion of the taken photographs between participants, the initial idea was to bring them together based on the use of common fishing gears, in 7 focus groups ranging from 2 to 4 individuals. The aim of these focus groups was for participants to explain to the

[26] The discovery of *Labo Tropic* has been the fortunate outcome of snowballed encounters with very helpful individuals, starting with one of my fishmonger informants at the fish landing dock in Joal, whose husband owns a photography store on the town's main road. This man, not processing analog photography any longer in his store, oriented me to a former colleague, who himself used to work for *Labo Tropic*, and who thus became my contact point in Mbacké.

other(s) and myself why they had taken their photographs, what they represented, and how they related to social-ecological changes. However, due to multiple constraints including the aforementioned communication mishaps between myself and fishers, their personal fishing schedule and my own interview schedule with other informants for many based elsewhere than in Joal, as well as the holy celebration days of *Aïd El Fitr*[27], only 5 focus groups could be organized, ranging from 2 to 3 participants. As it proved challenging to bring some of the participants together with the others that I wanted to group them with, the last 7 participants unfortunately presented and discussed their photographs individually with me in interview format, instead of in groups.

Besides for 3 participants, all photovoice discussions took place at my gatekeeper's home. At the very beginning of the discussions, a first sampling of photographs was made individually by each participant upon my invitation. All participants were indeed asked to sample 10 of their own photographs, which they considered most important and that they would be particularly keen to reflect upon. Beyond the mere taking of photographs, allowing for participants to select the photographs that they deem most important constitutes an important element of the participatory nature of photovoice (Latz, 2017). For another, it also helped drastically reducing the number of images to be discussed in order not to hold off fishers for too long a time. While photographs proved to be an excellent conversation-initiating medium, it should also be noted that besides one, the focus groups were unfortunately not as interactive as expected. With focus groups, indeed, facilitation is more complex than it looks (Stewart-Withers et al., 2014).

Rather, thus, participants often presented their photographs one after the other to the interpreter and myself, in what rather was an individual interview-like exchange than a focus group discussion. This might have been due to the chopped flow of the exchange resulting from interruptions for language interpretation, or simply due to the other participants holding back and not daring to interrupt the participant "in focus" presenting its photographs. For another, it would research-wise probably have been more fruitful for me to bring together fishers using different types of fishing gear within the same focus groups, rather than grouping them by identical fishing gear. This would probably have allowed for generating more exchange between fishers vis-à-vis their interactions at sea, including particularly the conflicts between

[27] *Aïd El Fitr* is referred to as *Korité* in Senegal.

fishers using active (e.g. drift gillnets) or passive gear (e.g. set gillnets and fish traps)[28] (see chapter 5). At the end of each discussion, participants were all invited to keep their respective printed photographs. The act of giving the photographs back to participants is seen by Wang and Burris (1997) a way of expressing appreciation, respect, or even camaraderie (:378). In total, the photovoice process spanned over 34 days and ended on the very last day of my fieldwork in Senegal.

4.2.2.3. Secondary data sources

Secondary sources finally, constituted the last means to collecting data used as part of this research. Such data, deemed necessary in light of my objectives and research questions, which seek particularly to link processes unfolding at the local scale to broader scales, included data that was kindly provided to me by informants (e.g. fish landings data), as well as gray and scientific literature. The latter not only helped me familiarizing myself with the study area and case before reaching Senegal, but also filling existing gaps in my primary data for the sake of my analysis. By way of concluding and before succinctly describing the latter process, I may say that I sought to unfold, as described by Paulson et al. (2003) in the context of political ecology research, an overall data collection process that aimed to "link in-depth ethnographic research within [a] particular [locale] with 'studying up' through interviews with authorities and corporate leaders, analysis of legislative and political material, and research into the relevant 'gray literature'" (:211).

4.3. Data analysis

Once collected, raw data need be organized and processed before they can be analyzed (Berg & Lune, 2012:54). The first step in this regard was to proceed with the verbatim transcription of the primary data collected through both semi-structured interviews and photovoice focus group discussions. Halcomb and Davidson (2006) describe verbatim transcription as the "word-for-word reproduction of verbal data, where the written words are an exact replication of the audio recorded words" (:38). This transcription process, meant to be applied to all interviews

[28] This occurred to me on a day when two photovoice groups of fishers "ran into one another" at the location where focus group discussions were being conducted. A group of trap fishers indeed followed a group of drift gillnet fishers, and although the exchange between them was in Wolof, I could understand that it was revolving around their different uses of the marine space and related scuffles – which are being described in more detail in chapter 5.

and focus group discussions and initiated at the field site already – as a means to already identifying central themes (Stewart-Withers et al., 2014), proved to be a way more time-consuming and tedious process than expected – not least due to the large amount of primary data that was collected. As a result, and due to time constraints, not all interviews nor focus group discussions could be transcribed entirely – little less than one fourth of the interviews and focus group discussions were not transcribed verbatim. The completed transcriptions, nonetheless, allowed me to get well-acquainted with the collected data material, and enabled thorough and repeated examinations of the participants' statements (Bryman, 2016:479).

Data analysis was conducted through thematic analysis, a generic approach to qualitative data analysis, whereby themes and subthemes emerge from repeated and careful readings of the interview transcripts that make up the data corpus (Bryman, 2016:585). Data derived from interviews and focus group discussions that had been transcribed verbatim were coded using the qualitative research software *Nvivo*. Not so much for its multiple functionalities, but as a means to thoroughly organize the rather large and diverse amount of data. As such, *Nvivo* proved particularly useful in that it for instance allowed for linking the coded text from photovoice focus group discussions to the very photographs that elicited participants' statements. As for the non-transcribed data material, it was analyzed by repeated listening and by taking manuscript notes. As such, the coding process altogether involved both coding up from the data, and coding down, drawing upon my research questions and not least my analytical lens outlined under chapter 3. Hence this thematic analysis entailed particularly looking for repetitions, similarities or differences, and possible missing data among participants' statements (Bryman, 2016:586), as well as looking for possible justifications and explanations of discussed issues and phenomena (Berg & Lune, 2012:188). Along this overall research process, however, multiple challenges were certainly encountered, which I endeavor describing in the following subsection.

4.4. Challenges encountered and limitations

By far the biggest challenge I faced was time, and the lack thereof, which significantly affected the planning and conduction of fieldwork. This was first and foremost the unfortunate result of the global unfolding of the COVID-19 pandemic since late 2019, and its far-reaching and intricate socioeconomic consequences, which most of us still – albeit to differing degrees –

experience at the time of writing. From spring 2020 onwards, the sanitary emergency around, and the death toll resulting from COVID-19 led to the rapid implementation of drastic measures, including social distancing and home confinement measures worldwide (Lung, 2020). In this context, I reached my fieldwork site some 4-6 weeks later than was initially planned.

All privileged global traveler complaints aside, another challenge however soon awaited me in Senegal. Of sociopolitical nature, this challenge it must be stressed was, first and foremost one for the Senegalese population. Indeed, following the arrest of political figure Ousmane Sonko – currently President Macky Sall's most notorious opponent, on March 3rd 2021 (Soumaré, 2021), several of the main cities in Senegal became the stage of important social unrest in the form of demonstrations and riots, over what was by many considered a politically-motivated arrest. In a country considered one of the politically more stable democracies in Africa (Hurley & Manel, 2015), the magnitude of this unrest came to many my informants and other contacts in Senegal as a surprise. This unrest was also attributable to the exhaustion of part of the population as a result of socioeconomically burdensome COVID-19 mitigation measures, including a 9:00 pm – 5:00 am curfew in the regions of Dakar and Thiès. Impacting particularly the informal economy, the latter was in place since January 5th 2021 (Government of Senegal, 2021) after having been implemented during 2020 already (Rokhy, 2020).

On March 4th, in the midst of my second week of fieldwork, I traveled up from Joal to Dakar with the intent to meet interview participants in the city the next day. As a result of a poor assessment by myself of the unrest at that very moment already taking over some of the main cities of Senegal, I found myself, along with other Senegalese travelers, caught in quite important riots approaching Dakar. Our shared taxi and most cars were getting stoned on the highway driving through burning tires and heavily protected police forces. The situation only became worse approaching the city center and my final destination downtown. The acuteness of the situation led the two informants I was supposed to meet in the capital city the following day to kindly postpone the planned interviews so I would not need taking inconsiderate risks moving during the riots in order to meet them. Given the tense situation in Dakar, my gatekeeper even suggested to "exfiltrate" me from the capital city by pirogue so I would be able to rejoin Joal where no demonstrations were taking place, and continue my research. This however did not need to happen. Following a national television announcement by President Macky Sall on

March 8th and the subsequent shortening of the economically burdensome curfew[29], demonstrations ceased. This, in turn, allowed me to conduct my interviews in Dakar and to reach Joal again a few days later – by the road.

Besides the aforementioned practical challenges, more strictly research-related challenges were met as well. In this regard, a first challenge pertained to working with in total three languages – Wolof, French, and English. While I was able to learn some basic Wolof sentences and words during my stay in Senegal, I needed to receive interpretation assistance for interviews at the non-institutional as well as for photovoice focus group discussions. One issue in that regards is that different people assisted me with this task, based on their availability. While I had settled on a formal agreement with a collaborator of my gatekeeper for interpretation, she was unfortunately not always available as she was often taken by her own work with two different environmental NGOs based in Joal. Hence, other people came to informally assist me with interpretation of both interviews and focus group discussions, including my gatekeeper, and the two researchers from CRODT already mentioned under subsection. However, while being assisted for interpretation enabled me to understand the interviews that needed to be conducted in Wolof, this also created a distance between participants and I, and the information was unavoidably somewhat filtered by my interpreter(s) (Mclennan et al., 2014). This point of caution, I must stress, is by no means pointed at the work of my interpreters, but rather at the very process of language interpretation and what it more often than not entails for the validity of the research (see Esposito, 2001).

Another element worthwhile mentioning here pertains to my position as a researcher within the fisherfolk community I was part of for three months, and my relation to research participants. Indeed, qualitative research – not least with fieldwork, indeed involves close, dynamic and more often than not complex relationships between the researcher(s) and research participants (Stewart-Withers et al., 2014:62). Leff (1999) in that regard argues that a crucial objective for political ecologists is to critically reflect upon how one situates him/herself in the very power-knowledge circuits that the field seeks to understand. This in turn begs for clarifying elements of reflexivity as part of this research.

[29] From 9:00 pm – 5:00 am to 12:00 am – 5:00 am.

Reflexivity, in the words of Sultana (2007), entails "reflection on self, process, and representation, and critically examining power relations and politics in the research process, and researcher accountability in data collection and interpretation", and is particularly important in the process of conducting international fieldwork (:376; cited in Stewart-Withers et al., 2014). I already briefly touched upon what I perceived for me to be a good access to study participants at the non-institutional level, thanks particularly to my gatekeeper. In my view, by living in his house in exchange for financial compensation, and relying on his help, I inscribed myself within preexisting intracommunity influence and wealth differentials, which at the same time constituted an important layer of my research.

Another necessary reflection in that regard pertains to the sampling and recruitment of the photovoice participants, and indeed to the very possibility for me to even unfold the aforementioned process with fishers in Joal. This would indeed have been absolutely impossible without my gatekeeper's help, whom I am therefore extremely grateful for. However, while the purpose of the method's use was to elicit the views and tales from people that do not find themselves in positions of power, I myself did, for being able to implement the method with fishers, again benefit from the influence of my gatekeeper, who given its multiple caps, certainly can be described a powerful individual in the fisherfolk community living in Joal. Although all participants formally gave their consent to part take in the process, it is thus not evident for me to know exactly whether this consent was motivated by a genuine interest, or somewhat influenced by their relationships with my gatekeeper[30].

What is more, in handing the cameras to men only – artisanal fishing is strictly a men's activity in Senegal, a gender bias must be acknowledged in the use of photovoice as part of this research. A bias one might perhaps see going against the feminist theory that the method is rooted in (Wang & Burris, 1994). It seems, nonetheless, that handing cameras to artisanal fishers for them to express their self-defined concerns about the social-ecological changes that impact their lives and livelihoods, did indeed do justice to photovoice's intent to give "the people who experience powerlessness as their dominant social reality" a voice (Wang & Burris, 1994:185). The use of photovoice was thus, in my view, particularly well-suited as part of a study adopting a political ecology analytical lens. Indeed, not only does political ecology seek to contribute to sound

[30] Note however, that once "the word was out on the streets" that I was initiating the photovoice process, several fishers who I had never met before expressed their interest in taking part in the latter (!).

natural resource management, but equally to empower disadvantaged social groups (Zimmerer, 2000:357). In this regard, Walker (2006) once deplored that "political ecology does not place an especially high priority on 'giving back' to its research subjects" and thus remains a "largely extractive" field of study (:366). As modest a contribution it was, I am hoping fishers' photographs that I printed and handed them, would be seen constituting a first step in "giving back" to people whom from I have, rather than "extracted", learned so much. The preceding leads me to conclude this chapter with succinct ethical considerations under the following section.

4.5. Ethical considerations

This research was conducted upon the ethics guidelines and approval from the Norwegian Centre for Research Data (NSD, *Norsk Senter for Forskningsdata*). Ethics are central to any research project that is being undertaken, not least within qualitative research (Banks & Scheyvens, 2014). Simply put, "research ethics is all about acceptable versus unacceptable ways of doing research", which first and foremost entails not harming anyone in the process (Kanazawa, 2018:334). Central to the conduction of ethical research is the notion of study participants' informed consent (*ibid*). For interviews conducted at the institutional level, study participants were being provided with an informed consent form, either on paper or by email. "The advantage of such forms", Bryman (2016) notes, "is that they give respondents the opportunity to be fully informed of the nature of the research and the implications of their participation at the outset" (:131).

While I for sample categories 4-6 formally collected participants' names and titles within their institutions/organizations/businesses, I in my findings and analysis (see chapter 5) only refer to participants from these sample categories by their titles and institutions, as I did not deem necessary to include their names in the text. For sample categories 1-3, as part of which the literacy level of many my informants did not allow for circulating a written document, informed consent was obtained orally, following thorough explanation of the purpose of my study and what participation in it entailed for participants, by either myself or my interpreter(s). As already noted, all interviews and focus group discussions were audio recorded upon participants' consent.

As for photovoice, ethics revolving around the method proved to be more complex (see e.g. Wang & Redwood-Jones, 2001). Indeed, besides the burden that the process may possibly place upon photovoice participants, important matters include non-exhaustively ownership of the photographs and possible invasions of privacy (Latz, 2017). In that regard, the unfolding of a photovoice process normally entails the use of three distinct consent forms: (i) consent to participate in the study – to be collected by the researcher; (ii) consent from individuals to be photographed by photovoice participants – to be collected by the latter; and (iii) consent to use and publish the photographs, also referred to as photograph release form – to be collected by the researcher (*ibid*).

For the sake of the photovoice process as it unfolded as part of this study, both consent forms (i) and (iii) were provided to participants. However, upon recommendation from the NSD and with the aim not complexify the photograph-taking process, photovoice participants were during the introductory meeting kindly requested not to take any close-up photographs of individuals (e.g. portraits), thus not requiring the use of consent form (ii). This, however, proved to be challenging in practice and indeed, many photographs included the faces of individuals – this was unavoidable it seemed at crowed locations such as the fish landing site. Hence, in order to abide by the aforementioned ethical principles of not harming anyone as part of this research, who would not have consented to part take in it, the photovoice photographs that I processed as part of my analysis and included in the pages of this thesis with the aim of underlining statement that they elicited from their authors do not, in my view, allow for the formal recognition of individuals that would be in focus.

5. Findings and analysis

This chapter presents the findings of my research in light of the research objectives and questions formulated in chapter 1. The first objective of this study is to examine the implementation of the JFMPA as a fisheries management intervention and its impact on artisanal fishers. The second objective is to situate the JFMPA within the broader political economic seascape, and unveil why the local scale, inherent to this fisheries management intervention, is the one favored for addressing overfishing and marine resource degradation in Senegalese waters. While the first objective and related research questions are thoroughly being addressed in this chapter, the objective two is partly addressed in this chapter and partly in the following.

The findings are first and foremost derived from semi-structured interviews and focus group discussions. Much space is therefore given to direct quotes from participants – as a means to add empirical depth to these findings, as well as to photographs taken by artisanal fishers as part of the photovoice process. Not mere "illustrations", these photographs have elicited, and thus underpin statements from artisanal fishers, which are included in the following as direct quotes in the case(s) where the verbatim French – and hence English – translation was available to me. Finally, these findings are not only echoed with, but also partly derived from scientific and gray literature I deemed relevant to this research, not least with regard to objective two. Hence, this chapter first outlines how the JFMPA is as, a fisheries management tool, being implemented, as well as its impacts on artisanal fishers (subsection 5.1), before situating the JFMPA within the broader political economic seascape (subsection 5.2).

5.1. Implementation of the Joal-Fadiouth MPA as a fisheries management tool and its impact on artisanal fishers

This first section describes the way the JFMPA is, as a fisheries management, currently being implemented, and its impact on artisanal fishers. As such, drawing upon my empirical findings, this section endeavors addressing my first research objective. Towards this purpose, this section is divided into three subsections, which layout the findings that allow me to put forward my arguments towards answering research questions 1a., 1b., and 1c. This section is accordingly

subdivided as follows: management and operationalization of the JFMPA (subsection 5.1.1.); consequences of the JFMPA for artisanal fishers at sea (subsection 5.1.2.); and reasons behind non-compliance with the JFMPA among artisanal fishers (subsection 5.1.3.). The section concludes with a summary of my findings.

5.1.1. Management and operationalization of the JFMPA

This first subsection describes the way the JFMPA is being managed and operationalized. Towards this purpose, three key elements are being layed out in the following: the unsealed co-management arrangement between the State and the fisherfolk represented by the MPA Management Committee; the very "park nature" of the JFMPA constituting the State's slot machine; and the way the JFMPA catalyzes environmental projects to the benefits of NGOs and a local elite. The subsection concludes with my argument towards answering research question 1a.

Co-management unsealed in the JFMPA

> "The marine protected area is managed by the State, because it was created by the State"
> Conservationist of the JFMPA (DAMCP) (Interview 31).

Under tutelage of the DAMCP, the JFMPA is on paper an MPA co-managed between the State and the fisherfolk represented by the MPA Management Committee. The co-management arrangement between the two parties in practice is yet best described as "unsealed". This is the result notably of tensions between former State representatives – in place until November 2020, and the Management Committee over each party's role, and over the very governance of the MPA – particularly vis-à-vis the apprehension and fining of fishers infringing upon its regulations. "There recently was a lethargy between us and the State agents who were assigned here", the Vice-President of the Management Committee told me (Interview 34). Not mincing his words either, its President rhetorically asked,

> "With the co-management or shared governance of MPAs, we need from the outset to know who is who. What is the role of these conservationists? Are they here as kings or demigods? Are they the ones who dictate the laws or are the people the ones who decide?" (Interview 67).

Some 3-6 months after "the changing of the guard" – at the time of my fieldwork, the stigma was still vivid, and a strong sense of distrust in the authority representing the State in the co-

management arrangement of the JFMPA prevailed, with this authority considered abusing its power over fishers at sea. This issue is, in the view of a former fisher now Oceans Campaign Officer with Greenpeace Africa, not only true for the JFMPA, but prevailing in fisheries co-management in Senegal at large,

> "Senegal has chosen the policy of co-management as a model for the management of its marine resources. It is not possible to give with the right hand and take back with the left hand. And today, in terms of co-management, this is yet what is happening in Senegal" (Interview 66).

In Joal, the result is, according to a long-standing member of the Management Committee, that "The population has totally lost interest in MPA. Totally" (Interview 20). Although not everyone shared this perspective within the Management Committee, attending multiple of its meetings allowed me to witness that at the very most 10 parties representing the population – out of the 25 parties making up the Management Committee – would generally be present. Some explanation for this lies in the fact that none of the parties are getting paid for their role nor participation, have other professional and personal commitments and, as the Vice-President of the Management Committee explained to me,

> "We always had attendance tickets for transportation. When you would leave the meeting, you were given 200 or 500 francs for transportation. We do not have that anymore, because we no longer have partners to support us this way" (Interview 34).

However, this lack of participation must also be seen as the result of a frustration among fishers over the JFMPA, and to a lack of real involvement of these, besides from in early meetings in the years around its inception in 2004. From the onset indeed, "participation has been instrumentalized, that must be recognized" a former WWF practitioner remembered and underlined (Interview 12). A persistent lack of renewing of the decision-making instances, with some members of the Management Committee clinging to their positions since its early days up to the point where they now personify the JFMPA, is furthermore locking its management within only a few influential and powerful hands. Unsealed, the co-management arrangement as it currently stands, both results from, and underpins the way the JFMPA is being operationalized at sea.

A "park" and the State's slot machine

Contrary to the sustainable use MPA (IUCN category VI) that it is described as in its internal regulations, the JFMPA is currently being enforced like a park, and was referred to as such by

many my informants during interviews. This is however not a mere expression of popular semiology among my informants, but rather the way the JFMPA currently is being experienced. "The connotation of the notion of 'park' is, in Senegal, extremely important and negative. If we take the history of conservation practice in Senegal, it means that the populations were being evicted from these spaces", a former WWF practitioner emphasized (Interview 12). The JFMPA is interestingly also considered a park – a "no-take area" to be accurate – in part of the most recent scientific literature assessing its ecological impacts (see Diankha et al., 2019; Thiaw et al., In press), which is further revealing a decalage between de jure and de facto management of this fisheries management intervention.

For another, in the JFMPA, conservation currently takes precedence over fisheries management – both objectives are often incompatible within an MPA (see e.g. Kolding, 2014). As the conservationist of the JFMPA told me,

> "At the moment, we are more focusing on conservation [...]. Fishing is going on. We cannot afford to let people exploit the resources as they wish, when there is a very, very large fleet, compared to the [ecological] potential that exists. We are therefore putting more emphasis on conservation. Because with a small crack, people will enter the MPA. [...] We are therefore putting emphasis on surveillance and control" (Interview 31).

Many fishers in this respect expressed to me their discontent apropos the fact that, never since its inception in 2004, the JFMPA was opened for them to fish – even just temporarily, and this despite the existence of a multiple-use zone from 4.5-9km offshore. "The MPA is for turtles! The fish?! No!", a former beach seine fisher now a fishmonger voiced (Interview 22), reflecting what a Program Manager at Wetlands International Africa described to me as a "scuffle between the basic needs of the people and the basic needs of the conservation sector" (Interview 48) – or "a dialog of the deaf" as Redford et al. (2006) once put it (:1). Far from being unheard-of among parties of the Management Committee – "We cannot close the MPA like that forever, the fishers ask us whether the MPA will not be open tomorrow" its Vice-President told me (Interview 34), this issue further exemplifies the population and the State's diverging positions vis-à-vis the very purpose of this intervention. "What causes a great deal of problems is that the conservationists apply the same management principles as in the national parks", a former WWF practitioner stressed (Interview 12).

The divergence between the population and the State also reflects the long-lived institutional conflict that has been surrounding the overarching management of MPAs in Senegal, between the two ministries that have over the years been competing for this responsibility – i.e. the MEDD and the MPEM. As a former director of CRODT summed up, "The conversationist only thinks about saving his species and saving his biodiversity, but the fisher has another logic, and this creates conflicts. These same conflicts can be found at the administration level of these MPAs" (Interview 37). This issue directly relates to the multiple objectives set for the JFMPA, and for MPAs in Senegal at large. As a result of this institutional dispute, "populations do not benefit from MPAs the way they should" a former fisher now Oceans Campaign Officer with Greenpeace Africa voiced (Interview 66).

Because of the way it is currently being managed, the JFMPA is much seen as the State's slot machine – not only among fishers or fishmongers but also within the Management Committee. "Conservation is good, but conservation does not mean impoverishing people! We are not here to fill the State coffers!", its President spoke out (Interview 75). "What I'm seeing right now, is they're going to board the fishers, fine them, and where does the money go? To the public treasury. It is in State's interest, if they operate like that", the Vice-President of the Management Committee complained (Interview 34). 70% of the money from fines is indeed currently going to the State, whilst the remaining 30% are being restored to its agents on the ground in MPAs – which may constitute an incentive for them to apprehend more fishers at sea.

In this regard, source of frustration and bitterness for many fishers interviewed as part of this research, was the issue of clientelism and corruption surrounding the JFMPA's surveillance patrol[31]. Apropos this issue, the captain of a purse seiner uses an interesting metaphor,

> "The park is surrounded with politics. You know why I am telling you it is surrounded with politics? It is like the child who has his mother and the child who has not. Today, if you are my friend, and you work in the park, when you have to go on surveillance, you tell me so I can go fishing. When you do not go on surveillance, you warn me, and I do not go fishing. This phenomenon is very frequent in the park" (Interview 70).

Fishers are indeed not all in the same boat when it comes to being prevented from fishing withing the JFMPA using prohibited gear. A phenomenon that was confirmed to me by both

[31] The surveillance patrol is composed of both State agents in uniform from the DAMCP and voluntary fishers from Joal. While the former are getting paid by the State through the budget yearly allocated to the JFMPA, the latter are not.

the President and the Vice-President of the Management Committee, and explained by the latter as follows,

> "Since [the guards] are not getting paid, fishers often cheat with them. So you can catch a fisher, who says 'wait I will give you 25- or 30 000, you let me go'. Corruption. I can say it. Because they are not getting paid" (Interview 34).

This corruption can also take the form of members of the surveillance patrol selling the seized fish for their own benefit, or as a woman fish monger explained to me, "you sell the fish, and then you give them money" (Interview 71).

Not recent, "The issue of fines causes a lot of problems in Joal-Fadiouth since a few years", a former WWF practitioner informed me (Interview 12). When caught infringing upon the regulations, these are indeed seen by many fishers a heavy burden, and yet another thorn in their side. As one told me, "When you go fishing all day, you won't even earn 50 000. But when they catch you, they will ask you to pay [FCFA] 100 000. That's not normal! It's hard!" (Interview 82). A retired fisher, representative of the Management Committee since the early days, summarizes well the way the JFMPA is seen as being currently managed,

> "We no longer are an MPA. We are a park with soldiers, who only catch fishers, reprimand them, and impose fines, without sparking them to respect the ecological rules of the MPA. They are quick at fining them, but this is not what the MPA was originally about. It was originally for the sustainable management of the resources, so that the populations would feel concerned by the management of these. [...] It is yet currently the complete opposite" (Interview 20).

The functioning described in the above fragment is one I was able to verify with my own eyes one night.

> At 2:00 am, a group of fishers coming from Mbour – located some 30 kilometers north of Joal-Fadiouth, is caught beach seine fishing[32] in Ngazobil at the northern part of the JFMPA by the marine surveillance patrol. Called over because the fishers refuse to comply, the conservationist, two state agents in arms, the President of the Management Committee, and a civil surveillance agent hop into the State representatives' black pick-up truck, and roar it towards the site of infraction, where the surveillance patrol is holding up the non-compliers. Tagging along, and surprised by the rifles in the truck, I inquire about their purpose. "You never know who you're going into", the President of the Management Committee replies.

[32] Beach seining is not only forbidden within the MPA, but along the entire coastal strip spanning from Dakar to the northern Senegalese-Gambian border, by way of the Maritime Fishing Code.

> Arriving at the beach, the exchange between representatives of the State and the Management Committee on the one hand, and fishers on the other, is tense – to say the least. The captain of the fishers is a recidivist am I being told (interactions are in Wolof), and is hiding somewhere in the darkness. Three of his fishers are thus being arrested, and driven to the offices of the JFMPA, where they shall get fined, and spend the night in jail. One of the fishers is carrying their pirogue's outboard engine on his shoulder. Engine seizure is not uncommon in the case of violations of MPA regulations, quite the opposite. As the captain of a purse seiner who was once caught illegally fishing in the JFMPA told me, "I fished there, I was apprehended, they took my machine, I paid money, and they gave it back to me" (Interview 70). On the way back from the intervention, I do not seek to part take in the administrative steps that follow (the fining, etc.), as I understand my observations should best end here for the night (fieldnotes, Joal, May 2021).

Exemplifying the indivisibility of the rifle from the title in State control over land/ocean (Grajales, 2011), the scene I witnessed was, nonetheless, one of militarized conservation (see e.g. Duffy, 2014; Witter, 2021), whereby conservationists are becoming more willing to engage in coercive and repressive practices. Criminalizing the poor, the JFMPA thus constitutes for the State a means to expanding its coercive power over the coastal maritime domain. A coercive power that is complemented by the remunerative power of environmental NGOs through projects having the JFMPA as a spatial target of implementation.

A catalyzer of environmental projects to the benefit of NGOs and a local elite

> "MPAs are being created to capture outside funds. Looking for a project, taking money from the project... We are all in this together, that's how it works. All the MPAs work like that, it's not only the one in Joal. We are capturing projects, period. An evaluation needs to be made: all the projects that have passed through Joal, all the money that has been spent on these projects, all the budget that has been allocated to the conservationists, all the money from the fines of apprehended fishers; that's billions in Joal! And what are the results? Nothing!" President of the Management Committee (Interview 67).

Striking in the steering of the management of the JFMPA is the influence of international environmental NGOs. This has been the case since its inception, and is first and foremost the result of the remunerative power of these organizations, which enables them to position themselves as unavoidable private actors in the funding of the MPA. Although the exact share is changing from year to year, nearly two thirds[33] of the funding of the JFMPA is this year coming from international environmental NGOs, including Wetlands International Africa, IUCN, as well as the RAMPAO – and generally channeled through the DAMCP, through

[33] Around FCFA 8 million from the State and around FCFA 14 million contracted from NGOs at the time of the field work.

projects which the JFMPA is a catalyzer for. This is particularly facilitated by the long-lived ties of some members of the Management Committee, who have with time positioned themselves as what is best described as local development brokers, i.e. "social actors established in a local arena who serve as intermediaries to drain (to the social space corresponding to this arena) external resources from what is commonly referred to as 'development aid'" (Olivier de Sardan & Bierschenk, 1993:1), and who are part of the local elite in Joal.

This functioning of the MPA is something that I was – participating in multiple meetings and seeing practitioners from, and consultants for different environmental NGOs coming and going – able to witness myself, and which a Project Officer at Wetlands International Africa[34], summarized well,

> "It is just a formality. [In Joal] we are always working with the same group of people. […] So of course, it is a privileged area. We do not need to restart anything. Just a continuation of what we have been doing. Everything fits" (Interview 48).

Many discussions during meetings of the Management Committee that I have attended indeed revolved around the approval of new projects that would have the JFMPA as a space of implementation. Reflecting the aforementioned position of the President of the Management Committee on the true spinoffs of such projects and quite clear about this issue, a former head of the surveillance patrol of the JFMPA voiced, "The projects won't even reach 1% of the people who live here!" (Interview 68). In that regard, the JFMPA is at the moment much seen primarily benefiting women associations harvesting oysters in the mangrove areas – represented best and most regularly during meetings of the Management Committee, through different livelihood diversification projects. "Any projects for fishers? No...", the Vice-President regretted (Interview 34).

The footing of members of the Management Committee in both artisanal fisheries – as either retired fishers, fishmongers, and/or union representatives, as well as in the conservation business – for instance as employees of national and international environmental NGOs, reflects a form of hybridity of these actors. These are indeed able to capture the rent of the green/blue manna using the influence that their position within the Management Committee has allowed

[34] The NGO is based in Dakar and has a long-standing project implementation history with the Management Committee.

them to gain, while representing fishers both locally and in national manifestations and political discussions. “It is important to understand that MPAs, at one point, used to draw a lot of funding” a former WWF practitioner explained to me (Interview 12). Conservation projects are – for those financially benefiting from them at least, more lucrative than artisanal fisheries. When regarded as two faces of the same coin, marine conservation – even if framed as fisheries management – turns in the current moment out to be more lucrative than marine exploitation. As stressed by a Management Committee representative, “I am fighting tooth and nail to keep my son out of the fishing business. Because it’s 80% certain that he’ll go bankrupt. It’s a sure thing. Only a tiny fraction of people is making it” (Interview 20).

As a result of their remunerative power – disproportionate compared to that of the State, international environmental NGOs impose themselves as heavyweight actors in – not so much the day-to-day but – the overall management of the JFMPA in their ability to steering it by giving priority to certain matters over others. This includes surveillance and control. The last version of the management plan for instance – of which the review and approval by the Management Committee was delayed due to COVID-19 social distancing restrictions, was drafted in Dakar by a RAMPAO-hired consultant – something seen by the President of the Management Committee as adding insult to injury,

> “The MAVA [foundation] and RAMPAO are financing the revision of the management plans. They give the project to a company based in Dakar, which takes the old management plan, rectifies it in its office, and gives it to RAMPAO to say ‘Here is the management plan for the Joal MPA’. Without the conservationist, without the president, and without the people. How can you develop a management plan for the people of Joal in Dakar?!” (Interview 67).

By way of concluding this first subsection, and answering research question 1a, I argue that the JFMPA is in practice predominantly being managed by the State at the expense of fishers by means of a paper co-management arrangement. Furthermore operationalized at sea as a park where coercion and the fining of fishers prevails, the JFMPA is not the fisheries co-management tool it is set to be. Rather, it acts as a local scale institutional receptacle and operational place for decisions enacted, and projects formulated by actors of national and international importance, which are being implemented on the ground with an influential and powerful elite able of helping itself along the way.

5.1.2. Consequences of the JFMPA for artisanal fishers at sea

This second subsection describes the consequences that the JFMPA has for artisanal fishers at sea. Towards this purpose, three key contextual elements are being outlined in the following: spatial competition and conflict between artisanal and industrial fisheries; spatial competition and conflict between artisanal fishers using different fishing gears; and the growing areal hold of spatial fisheries management and/or conservation interventions being established along the coastline. The subsection concludes with my argument towards answering research question 1b.

Spatial competition and conflict between artisanal and industrial fisheries

> "The problem of conflicts at sea between artisanal and industrial fisheries is a latent problem. It is a problem that has always existed, and it has always been David versus Goliath".
> Former Director of CRODT (Interview 37)

Increasing, competition and conflict between artisanal and industrial fisheries in Senegal over marine resources is not recent – several retired fishers told me about violent interactions they have had with industrial boats dating all the way back to the late 1980s and early 1990s, and is acute. Competition between the two subsectors is, however, not merely limited to marine resources, but equally taking place over the marine space where fishing operations are being conducted. As underlined above by a former Director of CRODT, this competition is one where the artisanal subsector is, and has long been outcompeted.

Competition over space between artisanal and industrial fisheries is for the artisanal fishers first and foremost a matter of safety at sea – both safety of fishers' lives and safety of fishing gear. "Fishers constitute a very vulnerable group, as a result of the very precariousness of their profession. By braving the seas and oceans, they are exposed to terrible risks of insecurity", the Executive Secretary from ADEPA pointed out (Interview 35). Well-known and deplored by many, this situation was best summarized by a former fisher now Oceans Campaign Officer with Greenpeace Africa.

> "Industrial fishing boats and pirogues are operating in the same fishing zone; with all the inconveniences this can cause. Problems of conflicts, problems of fishing gear destruction, and even sometimes problems of accidents, often with losses of human lives among artisanal fishers" (Interview 66).

Damages or losses of fishing gear to industrial boats were mentioned to me by many fishers – particularly longline fishers and fishers using set gillnets. It is indeed not uncommon for industrial boats to blatantly ignore the presence of artisanal fishing gear and even fishers on their course at sea. Such a perilous face-à-face beyond MPA boundaries was well captured by a longline fisher in one of his photographs (figure 5).

Figure 5: Photograph pirogue of longline fishers in full activity outside the JFMPA forced to veer away whilst an industrial fishing boat maintains its course upon them
(Photovoice participant 13 – Photograph 12).

In case of a conflictual – when not violent – interaction with an industrial boat that would result in a loss of fishing gear, artisanal fishers must often engage in a chase of the implicated boat and attempt to board the latter in order to ask reimbursement of the incurred loss. This, however, is a gamble, insofar as the captain of the boat may easily refuse to pay for the damage on the spot, and instead orient artisanal fishers towards the Department of Fisheries Surveillance and Protection (*Direction de la Protection et de la Surveillance des Pêches*, DPSP) located in Dakar for registering their complaint. A lengthy procedure reducing the likeliness of fishers to obtaining compensation.

Sea-based conflicts between artisanal and industrial fisheries is much the result of a non-observance of the fishing zones established by the Maritime Fishing Code of Senegal. Not only is this zoning intended at preserving coastal marine resources from the industrial fleet's operations near the coastline, but also at guarantying some level of safety for artisanal fishers at sea. At night, however, this zonation is often ignored by the industrial fleet, which illegally ventures into waters it is prohibited from accessing, several fishers told me – with all the risks this entails both for them, their fishing gear, and their pirogues. Difficult to monitor however, the venturing in forbidden waters by industrial fleets constitutes the most widespread form of illegal fishing taking place in West African waters, and is in Senegal particularly facilitated by poor means of surveillance for the industrial subsector's operations (Belhabib et al., 2017; Doumbouya et al., 2017).

Figure 6: Photograph taken by an octopus fisher of pirogues and an industrial fishing boat operating in the same area some 53km au large west of Joal
(Photovoice participant 20 – Photograph 22).

Forays of artisanal fishers outside their "reserved" fishing zone[35] (figure 6) are, on the other hand – besides the cultural continuation of long-lived migratory practices, the result of a lack

[35] I here put reserved in between brackets, since there is in Senegal "no zone reserved for artisanal fishing but a maritime fringe of 6 nautical miles created by law 70-02 of 27/01/1970 where the use of bottom trawls is

of space and a perceived scarcity of marine resources. As a former fisher now Oceans Campaign Officer with Greenpeace Africa told me, "There is a lack of space, but the first link is resource scarcity. [...] Fishers are forced to catch fish in other areas, where industrial fisheries are also allowed to fish" (Interview 66). There, however, "You play hide and seek, and there is always a risk of losing your gear, or even the pirogue, because they are often being hit" the Vice-President of the Management Committee warned (Interview 34).

Established at a time when the number of pirogues was significantly lower than it is today, the current zoning of Senegalese waters as legally enacted by the Maritime Fishing Code is seen by many inadequate. As a former Director of CRODT voiced,

> "I am appalled when I hear that there are now 21 to 22 000 pirogues in Senegal. And we are not even sure. Because we don't know the figures. 20 000 pirogues, which you allocate to the different fishing sites – you realize there is no more space" (Interview 37).

Many – not only fishers but also practitioners and researchers – are thus proposing to expand the zone(s) prohibited to the industrial fleet (figure 7) further away from the coastline – with diverging proposed extents, as a means to pushing the fleet further away from the shore. These calls for action have been unheard by the authorities in charge up until the time of writing.

In this context, combined with the presence of industrial boats, the JFMPA was by many of my informants, regardless of their general perception of the MPA – either positive or negative, seen as contributing to increasing the spatial squeezing of the artisanal fleet at sea. "The boats come down to 13km. The marine protected area extends from the coast out to 9km. Between 9km and 13km there is almost no space left for artisanal fishers", for instance expressed a Senior Technician from CRODT (Interview 49). "Fishers are bunched up in a 4km radius. Technically, this is not feasible!", a representative of the Management Committee voiced (Interview 20). Besides contributing to exacerbating spatial competition and conflict with the industrial fleet, important is to note how the hold of the JFMPA at sea also plays into spatial competition and conflict that is internal to the artisanal fleet.

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prohibited" (APRAPAM, 2016; own transl.). This minimum of 6 nautical miles limit is extended to 7 along the *Petit Côte*.

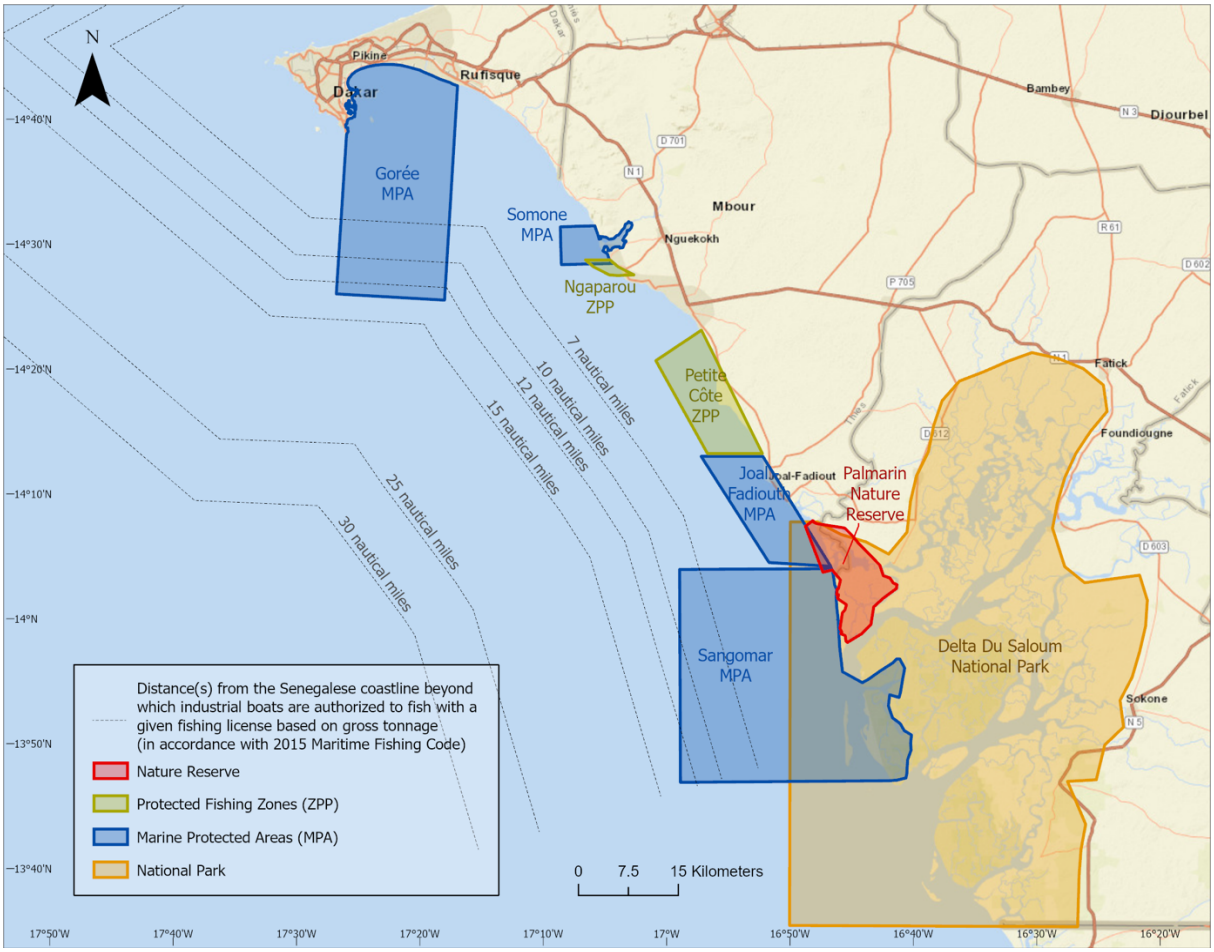

Figure 7: Map of the JFMPA embedded within other spatial fisheries management and/or conservation interventions implemented along the Petite Côte, and the fishing zones as legally enacted by the Maritime Fishing Code
(Data sources: Service Layers : ESRI; Here, Garmin, NGA, USGS; Protected Planet; Maritime Fishing Code)

Spatial competition and conflict between artisanal fishers using different fishing gears

> "Most conflicts within the artisanal sector arise from the use of specific fishing gears in dedicated areas" Former Director of CRODT (Interview 37).

As outlined in chapter 2, Senegalese artisanal fisheries are characterized by the usage of a grand diversity of fishing gears. These are associated, however, with diverse and at times incompatible – when not conflicting – marine spatial practices. An incompatibility all the more exacerbated by the aforementioned spatial squeezing of the artisanal fleet. Conflict between artisanal fishers using different fishing gears is particularly acute between those using traps and/or set gillnets (i.e. passive gear), and those using drift and/or encircling gillnets (i.e. active gear). While the former – harvesting their catch at set locations, have a rather spatially "fixed"

appropriation of the ocean, the latter – much like purse seine fishers, roam the ocean in search for fish schools.

The bone of contention between these groups of fishers is not new, and "has always created problems", a retired Research Assistant from CRODT told me (Interview 19). As the Conflict Manager at the fish-landing site of Joal explained to me,

> "There are many conflicts because the sea is like a field to fishers, and everyone wants to be cultivating this field. Of course, there are position quarrels. Fishers who use set gillnets are not comfortable with fishers who use *félé-félé*[36]. Because the set gillnet is positioned, and the *félé-félé* comes and hits it. Fundamentally there is a problem. A fishing trap, you leave it here, it is set, the *félé-félé* comes and takes it away. There are therefore always conflicts between fishers" (Interview 21).

Traps and/or set gillnets fishers often have their gear placed in a *qawe*[37]. "These types of fishing practices are zoned on the ocean", a Senior Technician from CRODT explained to me (Interview 49).

Figure 8: Photo of flag at sea partly delimiting the qawe of a trap fisher
(Photovoice participant 3 – Photograph 22)

[36] *Félé-félé*: drift gillnet in Wolof.
[37] *Qawe*: a more or less private are marked out at sea by artisanal fishers with flags working like a fishing concession.

The origin and workings of a *qawe* were well exemplified by a trap fisher, during one photovoice discussion,

> "This photograph is a flag, a landmark. When you arrive, you look at your flag, and you know your traps are here. We have a perimeter of about one square kilometer to mark the *qawe*. That's what we set up in order to avoid conflicts. I could leave my trap here, and someone else would come and pull it out and take its content. In the beginning things were like that. There was a lot of conflict. People were fighting at sea, going to the police. Finally, we got together, we discussed. Each of us would create a surface – a square, a triangle, it depends. But no one else will be allowed to put their traps into it" (Photovoice participant 3) (figure 8).

The spatial competition and the related conflicts between fishers come with financial consequences – for both trap/set gillnet and *félé-félé* fishers, who often find themselves damaging or even losing their fishing gear at sea. As one trap fisher explained,

> "We remained more than three months without going to sea because of the *félé-félé*. Our nets are set gillnets. We set them and return home. The *félé-félé* come at night, drag their nets, and when they find something, they cut it. This is why we are not working this month. At the same time, the pirogue had to be repaired, so I took it out of the water. We can say that it is a disease between the *félé-félé* and the small pirogues here. Every year the small pirogues suffer because of the *félé-félé*, which damage their fishing gear" (Photovoice participant 18) (figure 9).

Figure 9: Photo of a trap fisher's pirogue stranded due to a lack of means for taking care of its maintenance as a result of repeated fishing gear losses to félé-félé
(Photovoice participant 18 – Photograph 24).

With the overall increase in the number of pirogues operating at sea over the years, both the number and the spatial hold of *qawes* has increased as well. For the most located between the western boundary of the JFMPA to the shore, and industrial boats au large – including outside the zone prohibited to industrial fisheries, and with minimal room for maneuver due to their very type of "fixed" fishing practices, trap and/or set gillnet fishers and their *qawes*, find themselves in the front line of the artisanal fleet's spatial squeezing. These internal dynamics and conflicts pertaining to the maritime anthropology of artisanal fisheries in Senegal must be taken into consideration when analyzing the consequences of the JFMPA for fishers, and particularly its spatial hold on the ocean. This spatial hold must furthermore be envisioned in the bigger picture of spatial fisheries management and/or conservation interventions increasingly being implemented along the Senegalese coastline in commitment to international areal biodiversity conservation targets.

Growing areal hold of spatial fisheries management and/or conservation interventions being established along the coastline

Last but not least, the JFMPA must be seen as embedded within a national and regional network of spatial fisheries management and/or conservation interventions implemented along the coastline, and particularly along the *Petite Côte*, where Joal-Fadiouth is located (figure 7). A growing part of the *Petite Côte* is indeed coming under some level of areal protection – or "myriad new sociospatial designs" formulated differently (Zimmerer, 2000:358) (e.g. MPAs, nature reserves, protected fishing zones[38], etc.), which by restricting access to coastal fishing grounds, further increases competition outside the boundaries of such interventions – both among artisanal fishers, and between artisanal fishers and industrial boats. As the President of the Management Committee himself voiced,

> "We cannot have the Ngaparou ZPP, the Nianing ZPP, the Mbodiène ZPP, the Joal-Fadiouth MPA, the Palmarin Community-based Nature Reserve, the Sangomar MPA... From Ngaparou all the way to The Gambia, everything is set up as protected areas, while there are more than 21 000 pirogues fishing along 718 km of coastline. Where are the fishers going to fish!? When you go out to sea, the boats are there. That means what it means!" (Interview 75).

[38] A protected fishing zone (ZPP, *Zone de Pêche Protégée*), is a zone closed to fishing or with limited or regulated access, adopted by village communities in accordance with the Maritime Fishing Code in the form of a co-management arrangement with the State. These zones do not have the legal status of MPAs and are thus not under the administrative supervision of the DAMCP, but of the DPM (Diouf & Sané, 2020).

For most implemented later than 2004 – year the JFMPA was established, and situated in the waters that by way of the Maritime Fishing Code are forbidden to the industrial fleet (figure 7), these measures are gradually grabbing more marine space away from the artisanal fleet – whether based in Joal or elsewhere in Senegal.

By way of concluding this second subsection, and answering research question 1b, my findings suggest that the JFMPA contributes to increasing the spatial squeezing of the growing Senegalese artisanal fleet. This is the result of spatial competition and conflict between artisanal and industrial fisheries, spatial competition and conflict between artisanal fishers using different fishing gears, as well as the growing hold of other spatial fisheries management and/or conservation interventions established along the coastline. As such, the JFMPA not only restricts access to fishing grounds, but also increases already unequal competition and conflict for marine space – and indeed resources – beyond its boundaries.

5.1.3. Reasons behind non-compliance with the JFMPA among artisanal fishers

Between January 17th and May 20th 2021, 108 pirogues[39] have been apprehended within the JFMPA[40], with the large majority established in Joal. This figure, however, is only a low estimate, given the number of surveillance patrols being conducted on a weekly basis. Amounting to on average two to three per week, outings of the patrol are conditioned by weather conditions, tides, and the availability of people – the patrol is composed of both State representatives and fishers representing the population. In this light, this subsection outlines the reasons I have found to underpin non-compliance with the JFMPA among artisanal fishers. The subsection concludes with my argument towards answering research question 1c.

Scarce marine resources beyond MPA boundaries

> "It is not about stealing. Why do we want to fish in the park? There is no fish outside the MPA. The fish is in the MPA. That is why we fish in the MPA. [...] We fish in the MPA to catch fish to help our parents. Because here it is hard. In Africa life is hard!" (Interview 82).

[39] While I did not seek to quantify the level of non-compliance as such, this figure in my view nonetheless provides an estimate of the phenomenon.
[40] Data: JFMPA / DAMCP. The timeframe was selected based upon the available data at the time of the fieldwork.

The main reason why artisanal fishers may fish within the JFMPA with prohibited gear is the perceived resource scarcity outside its boundaries, as exemplified in the above statement of a *félé-félé* fisher. All fishers whom I discussed non-compliance with told me that on a day of *kaya*[41] when returning from beyond the JFMPA, trying one's luck within its boundaries may at times be needed – if not unavoidable, in order to cover the daily expenses of the household, or even just the cost of the fuel consumed during the outing – fuel represents the principal operating cost for fishers.

The perspective of this *félé-félé* fisher was shared across the different samples of people I interviewed. As a retired fisher, now a fish monger, told me, "You have nowhere else to go, you find it is only the MPA that is left, you will go there to support yourself. That is all there is to it!" (Interview 21). "Fishers go out to sea, they come back empty-handed. They have to enter the park, to catch fish, to feed their children!", a women fish monger told me (Interview 71). Many, if not most artisanal fishers indeed live hand to mouth, a former Director of CRODT emphasized, "The artisanal fisher, you have to understand his sociology, is someone who lives from day-to-day" (Interview 37). The President of MPA Management Committee himself, is much in line with this perspective,

> "Put yourself in their shoes. Someone who has a pirogue, who buys an engine, who buys fuel, who has a family waiting for him, he does everything, he goes to sea, he fishes here, you tell him 'It is forbidden', on the other side, you tell him 'It is forbidden', he goes to sea, he finds the boats. I mean, this is something we need to talk about!" (Interview 75).

The issue of perceived resource scarcity beyond MPA boundaries, and its role on non-compliance among fishers – as evidenced by a long-line fisher who illegally caught white grouper within the MPA (figures 10 and 11), is one even the conservationist is aware of,

> "We are really having problems. Because on the other side of the marine protected area there are boats. But also, we cannot leave the MPA to the fishers! It is not possible. We know there is no fish outside the MPA. We are aware of that" (Interview 31).

[41] *Kaya*: returning empty-handed in Wolof.

Figure 10 (left): Photo of a longline fisher illegally catching white grouper within the JFMPA (Photovoice participant 5 – Photograph 14).

Figure 11 (right): Photo of a box of white grouper illegally caught within the JFMPA by a longline fisher (Photovoice participant 5 – Photograph 11).

Fishing within the JFMPA however implies getting involved in some hide-and-seek moves with the surveillance patrol. There is only one surveillance pirogue – easily recognizable by from afar, and interested fishers are monitoring its comings and goings, and informing one another as necessary – "the watcher being watched" as it were. Setting up "traps" for fishers illegally fishing in the JFMPA, on the other hand, is not uncommon for the surveillance patrol – adding to the aforementioned frustration it generates among fishers. After coming back from their round, fishers that are part of the surveillance patrol often go back at sea with their personal pirogue with the aim to catch non-compliers sur le fait accompli, when they know a group of fishers is about "to make a move" – e.g. when they are being made aware of fishers waiting outside MPA boundaries or getting ready on the beach. A photograph taken on the beach of Joal by an octopus fisher exemplifies such a scene (figure 12).

Finally, while I favored the more neutral term "non-compliers", people infringing upon the MPA regulation were nonetheless often referred to as "poachers" or "thieves" by some of my informants. This labelling reflects how beyond merely being the result of some actors' will to work on a categorization, the JFMPA also produces new categories of individuals at the local level, whether against or for their will – as already noted with the advent of local development brokers. The production of "poachers" under joint efforts from the State and international environmental NGOs, again reflecting their power over the marine environment, must however be confronted with the fact that the JFMPA – albeit motivated by an ecological imperative, was established on traditional fishing grounds.

Figure 12: Photo of fishers have prepared their pirogues, gathered at the beach of Joal, and are waiting for the surveillance patrol to be back to go out and fish within the JFMPA
(Photovoice participant 6 – Photograph 15).

The JFMPA was established on traditional fishing grounds

> "In the past, where the park is located, there were all kinds of fish. We would catch all kinds of fish there. Where the park was established, the area of *Ngoussé Diokhé*[42], we would catch all kinds of fish there" (Interview 70).

Evidenced in the case of the JFMPA by the above quote from the captain of a purse seiner, the grab by coastal MPAs of artisanal fishers' traditional fishing grounds is – beyond the expression of implementing actors' power over the marine environment, explained by the spatiality of artisanal fisheries, which are generally operating within limited distance from the shore. Although I was not so much able to often grasp the local names of such traditional fishing grounds, the existence and maintained use of such names among fishers exemplifies how the JFMPA constitutes a *space* being superposed to existing *places*.

[42] *Ngoussé Diokhé* is a traditional fishing ground named after a protective spirit.

While the waters under protected status from the JFMPA used to be traditional fishing grounds for all beach and purse seine fishers, longline fishers, as well as trap fishers, the loss of these fishing grounds is in Joal particularly problematic for *félé-félé*, who specifically target bonga shad (*Ethmalosa fimbriata*). The species is first and foremost found near the coast by the entrance of tidal marshes. This may explain why this group of fishers remains today the main one being apprehended within the JFMPA – the JFMPA is indeed covering the entrance of the *Mama Guedj* tidal marsh. As a former head of the marine surveillance patrol explained to me, "The resource [that *félé-félé* fishers] are looking for is not in the high seas. That is the problem. *Ethmalosa* is a fish that is here, that is along the shore" (Interview 68). As a former fisher, now fish monger also told me, "There is no sardinella in the MPA, only *cobo*[43]. There is only *cobo* that goes into the MPA. By periods" (Interview 64).

Figure 13: Photo of bonga shad (Ethmalosa fimbriata) illegally caught at night within the JPMPA by a pirogue of félé-félé fishers
(Photovoice participant 8 – Photograph 3).

[43] Bonga shad in Wolof.

As the Vice-President of the Management Committee confirmed,

> "There are benefits that often accrue to the population. Right now, there's a lot of bonga shad in the MPA, and there's a lot of pirogues that are out there every day. [...] You're going to find fishermen who are always out there, and board two or three pirogues every day, because there is a lot of bonga shad" (Interview 34).

The fact, however, that fishers must infringe upon regulations – as exemplified by a *fĕlé-fĕlé* fisher with his photograph of illegally caught bonga shad by night (figure 13), and if caught pay, to rip "benefits" from the JFMPA, begs for questioning the very idea of "livelihood benefits" from the latter – the yet third proclaimed objective of MPAs in Senegal.

MPA boundaries are not clearly demarcated at sea

A third and last element that must be taken into consideration for understanding non-compliance – or better perhaps why fishers find themselves being apprehended, is the little number of buoys at the time of the field work remaining in the ocean for demarcating the boundaries and zoning of the JFMPA. As the President of the Management Committee clearly bespoke,

> "There are not enough buoys. There are only 4-5 buoys left around an area that should have at least 20. A new buoy costs between 3 and 6 million francs. When a buoy is cut, it must be recovered, brought back, and the chains changed, and there are currently no projects nor funds in the State coffers or the management committee's that have taken this contingency into account. It's a problem of funds, and of will" (Interview 77).

While the lack of boys is in material terms directly attributable to the aforementioned project-based functioning of the JFMPA, the non-compliance of fishers must also be seen resulting from a failing conservation boundary-making over the marine space. The poor demarcation of the JFMPA is adding confusion to already tense scenes of fisher apprehension at sea – as I was once given to witness during an outing, in which explicit contestation and negotiation are taking place over as to whether fishers find themselves inside or outside the MPA. This situation is for another leading fishers to at times being apprehended and fined where they thought they were not infringing upon any rules. "Often you arrest a poacher at sea, he tells you 'I am not in the MPA', you have a discussion, you are stronger than him, you seize one of his engines, and you take him away" (Interview 34). Coercion within the JFMPA indeed prevails over a socio-politically contested marine environment.

By way of concluding this third subsection, and answering research question 1c, it is my argument that the reasons underpinning non-compliance with the JFMPA among artisanal fishers are a perceived scarcity of marine resources beyond MPA boundaries, the establishment of the JFMPA on traditional fishing grounds, and the unclear demarcation of the JFMPA at sea.

5.1.4. Summary of findings

In this first section, I sought to describe the way the JFMPA is, as a fisheries management, currently being implemented, and its impact on artisanal fishers. As such, drawing upon my empirical findings, this section addressed my first research objective.

Answering research question 1a, I argued that the JFMPA is in practice predominantly being managed by the State at the expense of fishers by means of a paper co-management arrangement, and that furthermore operationalized at sea as a park where coercion and the fining of fishers prevails, the JFMPA is not the fisheries co-management tool it is set to be. Rather, the JFMPA acts as a local scale institutional receptacle and operational place for decisions enacted, and projects formulated by actors of national and international importance, which are being implemented on the ground with an influential and powerful elite able of helping itself along the way.

Answering research question 1b, I argued the JFMPA contributes to increasing the spatial squeezing of the growing Senegalese artisanal fleet, as a result of three elements: spatial competition and conflict between artisanal and industrial fisheries; spatial competition and conflict between artisanal fishers using different fishing gears; and the growing hold of other spatial fisheries management and/or conservation interventions established along the coastline. I have this light argued that the JFMPA does not only restrict access to fishing grounds, but also increases already unequal competition and conflict for marine space and resources beyond its boundaries.

Finally, answering research question 1c, I noted that the reasons underpinning non-compliance with the JFMPA among artisanal fishers are a perceived scarcity of marine resources beyond MPA boundaries, the establishment of the JFMPA on traditional fishing grounds, and the unclear demarcation of the JFMPA at sea.

5.2. The broader political economic seascape

This second section situates the JFMPA within the broader political economic seascape. As such, drawing upon my empirical findings as well as on secondary data sources, this section endeavors laying the foundations that allow me to further address my second research objective in the discussion chapter – that is to not only to situate the JFMPA within the broader political economic seascape, as I lay out in the following, but also to unveil why the local scale, inherent to this fisheries management intervention, is the one favored for addressing overfishing and marine resource degradation in Senegalese waters. Thus, the three related research questions 2a., 2b., and 2c. are being addressed in the following discussion chapter. The present section is divided into three subsections, which are respectively outlining the perceptions of marine resource degradation and scarcity, and the perceived impacts and causes thereof, among artisanal fishers and fishmongers (subsection 5.2.1.), the destination of the fish being landed in Joal (subsection 5.2.2.), and the politics of fisheries access in Senegalese waters (subsection 5.2.3.). The section concludes with a summary of my findings.

5.2.1. Perceptions of marine resource degradation and scarcity, and perceived impacts and causes thereof, among artisanal fishers and fishmongers

> "The main problem being faced is above all that of resource scarcity. Today, when fishers go to sea, they do not find any fish" (Interview 66).

The above statement from a former fisher now Oceans Campaign Officer with Greenpeace Africa was well exemplified by a *félé-félé* fisher through one of his photographs (figure 14). Within the artisanal fisheries subsector in Joal, resource scarcity is indeed the word on everyone's lips – as already touched upon vis-à-vis non-compliance with MPA regulations among fishers. *Amul jën*[44] – or equivalent statements, I have heard from most fishers and fishmongers I interviewed. "There is no more fish in the sea", a retired fisher, now a fishmonger, deplored (Interview 21). "The sea is simply being emptied of its occupants", another one told me (Interview 52). Another one voiced,

[44] "There is no fish", in Wolof.

> "The few remaining resources must be left to the artisanal fishery. I insist! The artisanal fishery needs them! This is a cry from the heart. There is no more fish in this sea! The little that we have left, leave it to the artisanal fishery!" (Interview 54).

Figure 14: Photo of a day of kaya for a pirogue of félé-félé fishers. Fishers' posture says all about the (non-) success of the day's outing, was I explained
(Photovoice participant 8 – Photograph 18).

To many not recent, and worsening over the years, the perceived resource scarcity comes with important social impacts.

> "Everyday life is no longer 100% secure. You used to wear nice clothes; you cannot do that anymore. Building houses, buying new pirogues, really, living your life. All this is now no longer possible because fishers' yields are getting lower and lower. There is no more fish in the sea. As long as there is no fish, you will have no income" (Interview 21).

The above statement from a fishmonger well exemplifies the social-ecological crisis that the artisanal fisheries subsector is faced with since around two decades. "There is a crisis in the fishing industry, linked to resource scarcity. People do not work full time anymore; the means have really dropped drastically", a retired Research Assistant from CRODT explained to me (Interview 19).

As a result of the ongoing depletion of many coveted fish stocks, many fishers find themselves forced to target farther and farther fishing grounds, not least in the waters of neighboring countries, e.g. off The Gambia or Guinea Bissau. “It is very difficult now to catch fish here in Senegal”, a retired fisher told me – echoing findings by Belhabib et al. (2014) of the increasing share of fish landed in Senegal that is being caught outside the country’s EEZ. Increasing the fuel consumption, longer outings in the chase for fish are swelling the operational cost of the fleet and reducing its overall profitability. This results for the most tenuous fishers in days without any fishing possible – as captured by one fisher on one of his photographs (figure 15), to the point where, in the words of a fishmonger, “This activity is in the process of disappearing, to tell the truth” (Interview 22).

Figure 15: Photo of outboard motors not in use. As a result of marine resource scarcity, days without going at sea become more and more common for artisanal fishers in Joal
(Photovoice participant 19 – Photograph 18).

Marine resource scarcity is furthermore forcing fishers to invest – when financially possible – into more, and more efficient fishing gear to increase their chances of catching fish (figure 16). A seldom practice until recently, fishers, fishmongers and fish processors are also now increasingly turning towards financial institutions in order to remain afloat. “It was a sector where there was almost no bank intervention. It is only now that people have started turning

towards them, because the situation has become so difficult", a retired Research Assistant from CRODT explained to me (Interview 19). "With this sea, and the pirogues always coming back empty, I had to go to the banks to take a close. I had never done that before" (Interview 64). Indeed, many fishmongers I spoke to are now indebted to banks.

Figure 16: Photo of fisher holding a newly made monofilament net. As a result of marine resource scarcity, investing in new fishing nets does not help catching more fish as it once used to (Photovoice participant 17 – Photograph 21).

For another, although I did not myself delve into this topic – due to its somewhat sensitive nature and because beyond the scope of this study, the illegal immigration of many Senegalese to Europe by the sea, was by many my informants seen a direct consequence of the longstanding economic hardship experienced by the artisanal subsector, not least in Joal. As one fish monger voiced,

> "To let the artisanal fishing sector die is to once again incite the youth to want to go to Europe, via these makeshift pirogues, with the consequences we all know: tens of hundreds of deaths, if not thousands of deaths every year" (Interview 52).

This phenomenon – already well documented (see e.g. Sall & Morand, 2008), is in Wolof infamous as either *barca wala barsakh*[45] or *mbeuk mi*[46].

> "We Senegalese only have fish. You Europeans, everything you want is here in Senegal. It is you who should take pirogues to come here. Because the resources you are looking for are here in Senegal. Oil, diamonds, fish, everything! Europeans come here and invest in the oceans. That's why the children targeted *Auchan* and *Total*[47]. Now, instead of the Europeans taking pirogues to come here to Senegal, our government has impoverished us so much, that we are the ones taking pirogues to go to Europe" (Interview 32).

Not merely brushing a grim picture of the current situation of Senegalese artisanal fisheries – noteworthy strongly aggravated by both national and international COVID-19-related disruptions, the above quote by a retired fisher reveals a certain underlying resentment within the subsector apropos part of the perceived causes of marine resource scarcity, i.e. the role of former – yet sustained – (neo)colonial and economically imbalanced relations between France – and the EU at large – with Senegal.

Best described as the *bête noire* of artisanal fisheries, the industrial fleet operating in Senegalese waters was by far considered the main cause for resource degradation and resource scarcity among the interviewed fishers and fishmongers in Joal. As one trap fisher claimed during a focus group discussion, "The boats are the main cause for fish scarcity. They are destroying the sea" (Photovoice participant 3). Equally vocal, a fishmonger voiced,

> "The boats are causing us a lot of trouble. Apart from the economic aspect, there are the social and environmental aspects of these boats. Economically, they are plundering the resource. Socially, they are killing us by hitting our pirogues. Environmentally, they are destroying the ecosystem. There are just too many problems with the boats" (Interview 21).

Industrial fisheries are by many seen incompatible with artisanal fisheries, not least because increasingly targeting the same fish stock as the latter. "There are boats fishing species that are prohibited to them, reserved for artisanal fisheries and for local consumption. There are also boats that under-report the quantity of fish caught", one fish monger stressed (Interview 52). In Senegal, marine catch and landings statistics are, both for artisanal and industrial fisheries,

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[45] "Barcelona or die" – this saying is related to the fact that Spain is due to its geographical position the first European country targeted by Senegalese migrants taking the sea.
[46] "To bump against" – in this saying Europe is seen a wall to pass; a wall migrants often only "bump against".
[47] Respectively a supermarket chain and an oil company, *Auchan* and *Total* were the two main French companies targeted during riots during early March 2021 (chapter 4), in protest against the neocolonial economic ties France is maintaining with Senegal.

surrounded with misreporting and transparency issues, and are therefore not considered reliable, to the point where overall removals from the country's waters are considered unknown (see Belhabib et al., 2013; Belhabib et al., 2014; Belhabib et al., 2015a; see also Sall & Nauen, 2017). This problem was mentioned to me by several informants

The perceived responsibility of industrial fisheries directly relates to their disproportionate and unmatchable fishing power in comparison to artisanal fisheries. As the Secretary General of the African Confederation of Artisanal Fisheries Organizations (CAOPA) and of the Association for the Promotion and Empowerment of the Artisanal Maritime Fisheries Actors (APRAPAM) underlined,

> "There are no more resources. Of course, everyone wants to go towards this resource, of which there is little left. It is a small cake that people have to share. But with the law of the strongest, it is the strongest who wins. And the strongest is the industrial fleet, with its hyper sophisticated equipment and the power of its vessels. Against pirogues, this inevitably causes problems" (Interview 76).

The industrial fleet was, however, far from being perceived the sole culprit for marine resource degradation and scarcity among my informants.

Many artisanal fishers and fishmongers indeed also pointed at their own subsector and its fishing practices. This was either noted in general terms, or by directly pointing to environmentally harmful practices. In the latter case, fishers generally pointed to practices adopted by fishers using a different type of gear than themselves – reveling again some of the conflicts inherent to the subsector. As such, one group particularly, was often pointed at, namely *félé-félé* fishers. This is directly related to the type of net used by this group of fishers, i.e. the monofilament[48], which although forbidden, remains widely in use. The monofilament, however, is increasingly being used by for instance set gillnet fishers as well, due due to its effectiveness.

The main perceived cause of resource degradation vis-à-vis artisanal fisheries was, however, the number of pirogues operating in Senegalese waters, i.e. the overcapacity of the artisanal fleet. "We are currently choking the sea. And when we are choking the sea, we are choking ourselves", a representative of the Management Committee voiced (Interview 20). Beyond the

[48] *Mbaalu-tiaass*, in Wolof.

mere number of pirogues, raised by many was also the evolution of fishing gears. "The pirogues are bigger; the nets are bigger. The fishing equipment has evolved. There is a lot of fishing equipment" a fishmonger for instance noted (Interview 64). Driven initially by developmentalist policies by the State from the 1980s onwards, the investment in more, and more efficient gear is for many fishers today motivated by the perceived scarcity of resources.

By way of concluding, I in this first subsection sought to layout the perceptions of marine resource degradation and scarcity, and the perceived causes and impacts thereof, among artisanal fishers and fishmongers. Coming most across of my findings, in that regard, is that marine resource degradation and scarcity is perceived as acute among both fishers and fishmongers, and comes with important socio-economic impacts for both their livelihoods, and lives in general. As for the perceived causes of marine resource degradation and scarcity, the industrial fleet is seen by far the main culprit, but not the only one. The artisanal fleet as well, and particularly its overall capacity, is seen by fishers and fishmongers to contribute to the perceived marine resource degradation and scarcity.

5.2.2. Destination of the fish landed in Joal

> "Senegalese fish is universal. I hope so! I hope it is universal! [...] Our fish can basically be sold everywhere" Fish monger (Interview 73).

Joal is the central hub for fisheries in Senegal and West Africa, a position that was best described to me by a Senior Technician from CRODT, in charge of monitoring daily fish landings,

> "Joal is the port with the most landings in Senegal. It is the first artisanal fishing port in Senegal. Some people even say it is the first port in West Africa. It therefore attracts a lot of people. Because of its geographical position, when a pirogue manages to make good catches at sea, and given the rate of product absorption – because Joal with its processing areas can absorb a huge amount of product, most of these pirogues, their reflex really, is to come to Joal. Because the market really does absorb here. Whatever the quantity" (Interview 49).

The pulse of the car traffic, the density of the crowds at the fish-landing site, the comings and goings of the coaches conveying small pelagic species from the fish-landing site to the two artisanal fish processing sites *Khelcom* and *Tann,* the smokiness of these; all is determined by the day's landings. The very effervescence of the town is a direct result of what the ocean was

willing to let fishers take away. “If there is no fish, it is as if the city of Joal was mourning” a CRODT researcher put (Interview 13).

Table 5: Destination of the fish landed in Joal (all species combined)

	2019	**2020**
LANDINGS		
Total tonnage unloaded (Kg)	94 709 905	84 916 276
Estimated commercial value (CFA francs)	21 295 617 360	14 542 811 165
Local consumption (Kg)	5 882 025	2 798 537
National consumption (Kg)	18 985 700	31 635 424
Reserved for artisanal processing (Kg)	50 029 980	36 299 946
Reserved for industrial processing (Kg)	20 180 980	14 363 369
ARTISANAL PROCESSING		
Dry tonnage[49]	16 676 160	12 099 982
Estimated commercial value (CFA francs)	8 335 974 700	4 957 481 200
Local consumption (Kg)	67 850	91 040
National consumption (Kg)	4 031 205	3 611 063
Exports (international) (Kg)	12 577 105	8 397 579

Source: Control station of fisheries and surveillance of Joal-Fadiouth – DPM.
Note: these figures do not totally add-up for 2020 in the data-set.

In 2020, fish destined to local consumption represented the smallest share of the fish landed in Joal by the artisanal fleet, while the biggest share was destined to the national market, closely followed by exports. When factoring in the destination of products made of fish that is reserved for artisanal processing, the aforementioned shares amount to around 4%, 50%, and 46% respectively, against 6%, 33%, and 61% for 2019, an exports-dominated year – the rerouting of fish from the export to the national market between 2019 and 2020 can be seen a direct consequence of COVID-19-related disruptions. It should be noted that for the above calculation, landings reserved for industrial processing were treated as exports, since these are first and foremost destined to the international market – not least the West African subregion. Indeed, “The African market, which accounted for barely 10 to 15% of Senegalese exports, is now the leading destination for Senegalese exports”, a fisheries economist from CRODT told me (Interview 38).

[49] The dry tonnage figure for artisanal processing is the figure reserved for artisanal processing dived by three to account for the loss of water.

As another Senior Technician from CRODT went,

> "There is a strong pressure from the [West-African] subregion on Senegal. You see, the artisanal processing sites here, most of their production is destined for the subregion, Côte d'Ivoire, Burkina Faso, Mali, Guinea. For industrial processing, it is the same, sardinella is being frozen, giant trevally is being frozen, and sold in the subregion. A very large part of our national production is being exported to the subregion" (Interview 49).

Counting the boxes[50] of flat sardinella (*Sardinella maderensis*) being unloaded from his purse seine pirogue at the fish landing site – landings of round sardinella (*Sardinella aurita*) have seen an important decrease for several months at the time of the field work– a fish monger explained to me,

> "That pirogue today came back with 600 or 700 boxes. Not only did the population of Joal-Fadiouth benefit from this catch today, but the whole of Africa did. The fish can go all the way to Nigeria, to Ghana!" (Interview 64).

Sardinella (both *Sardinella aurita* and *Sardinella maderensis*) are by far the species most abundant in landings in Joal (nearly 27 000 and 28 500 tons for each species respectively in 2020 for a combined total of more than 55 000 tons that year) (see table 6), and keep an important portion of Joal's population – from fishers, to fish carriers, to fish processors – busy the year round. "If there is no sardinella, it is chaos!" a retired Research Assistant from CRODT told me (interview 19).

Constituting what the Secretary General of CAOPA/APRAPAM describes as a "food safety net for the poorest populations" (Interview 76), sardinella is crucial in ensuring food security across West Africa, not least in Senegal (see e.g. Lancker et al., 2019). As a former fisher now Oceans Campaign Officer with Greenpeace Africa stressed,

> "Official texts state 70% of the protein intake [in Senegal] comes from fish. It does not come from *thiof*[51]! It does not come from sea bream! It comes from sardinella, horse mackerel, mackerel, and bonga shad!" (Interview 66).

[50] One box amounts to around 50 kg of fresh fish.
[51] *Thiof*: white grouper in Wolof.

Socioeconomically an important species – it figures on the FCFA 2000 note, white grouper is the most expensive high value species in Senegal, where it has as a result faded away from the national and subregional markets to the benefit of the international market[52].

Table 6: Total of sardinella landings in Joal by month and species in 2020.

	Sardinella aurita (Kg)	***Sardinella maderensis*** (Kg)	**Total** (Kg)
January	1 948 500	2 460 135	4 408 635
February	3 027 900	3 774 850	6 802 750
March	1 587 080	3 156 700	4 743 780
April	696 013	2 950 000	3 646 013
May	3 033 100	1 000 752	4 033 852
June	4 706 240	2 796 607	7 502 847
July	6 941 914	2 776 124	9 718 038
August	1 508 210	1 594 310	3 102 520
September	978 797	1 710 647	2 689 444
October	686 525	1 490 360	2 176 885
November	738 065	1 974 340	2 712 405
December	1 079 831	2 752 571	3 832 402
Total	**26 932 175**	**28 437 396**	**55 369 571**

Data: Control station of fisheries and surveillance of Joal– Directorate of Maritime Fisheries.

Once fish landed in Joal, "The international market is managed by industrial fish mongers, the national market is managed by local fish mongers", with the two markets competing, up to a point where "The local market is sometimes faced with fish scarcity. There is an important scarcity of fish on the local market", a local market fish monger explained to me (Interview 46). As another fish monger told me,

> "Accessing international export requires muscle. Export to the subregion is open to everyone. I can buy fish, there are no quotas, there is nothing, bring it to Guinea, Mali, in the subregion, as long as I have the financial means" (Interview 52).

Industrial fish mongers are in a position of power in the fish trade value chain, as indeed they are entitled to supply the more often than not export-oriented fish processing factories, whom they are receiving orders from, as well as a financial portfolio for securing these.

Not merely explained by the presence of artisanal processing sites – which first and foremost operate with small pelagic species, the high "absorption" of fish by the market is in Joal all the more driven by the presence of such factories, located in the close vicinity of the fish landing

[52] Nearly 20 years ago UNEP (2002) noted with regard to Senegal the "risk of local market supply shortages looms ahead, as fishing efforts shift from locally consumed species to export-oriented ones" (:iii).

site. *Elim Pêche*, first, a South Korea and Senegal-owned export-oriented factory, which specializes in marine gastropod mollusks (e.g. *Cymbium cymbium*, *Cymbium pepo*, and *Murex duplex*), as well as, to a lesser extent, in sardinella. As the Quality Manager told me, the gastropod mollusks processed by the factory are primarily destined for China, as well as for South Korea, sometimes Japan, and Canada and Mexico. Frozen sardinella, on the other hand, is exported to the sub-region – Ivory Coast primarily, as well as Guinea and Ghana (Interview 81).

Besides contributing to shaping the economic specialization of Joal, the presence and influence of such factories[53] is critical for understanding mutations within the artisanal subsector, not least vis-à-vis the choice of species targeted by small pirogues, such as sole (*Solea senegalensis*), cuttle fish (*Sepia officinalis*), elephant's snout volute (*Symbium glans*), and duplex murex (*Murex duplex*). As a retired Research Assistant from CRODT told me,

> "The goal of factory owners is to spur fishers to go fishing for certain species so that they can operate 24 hours a day. [...] Artisanal fisheries [in Senegal] developed through financing by factory owners. The only branch in which factory owners have hardly intervened is the small pelagic fishery" (Interview 19).

Financing schemes from factories – and generally channeled through fish mongers, include for instance the pre-financing of fishing trips in the form of fuel or fishing gear.

For another, a South Korea-owned fishmeal and oil factory, *Omega Fishing*, established in initially with the aim of absorbing the fish surplus at the landing site, particularly during the most fish-abundant period along the Senegalese coast, *thiorone*. Since then, however, the factory has also been targeting all types of fresh fish species, yet primarily small pelagic species such as sardinella (*sardinella aurita* and *sardinella maderensis*) and bonga shad (*ethmalosa fimbriata*). These indeed constitute the most affordable fat species – the fat content is important for fish oil production. For the factory to remain competitive, a box of fish cannot cost above FCFA 5000 upon factory arrival, i.e. around 3500-4000 francs unloaded from the pirogue[54]. *Omega fishing* has not been operating with fresh fish since July 2020, and has since then gone back to only processing fish offal coming from fish processing factories located in either Joal

[53] Leaving the fish landing site of Joal daily, trucks also supply export-oriented fish processing factories located on the way to, and in Dakar (e.g. Africa Fish, Blue Fish, Senepesca, etc.).
[54] At the time of writing a box of sardinella costs FCFA 8000-9000.

or Mbour. At full capacity, however, the factory has a processing capacity of 80 tons of fresh fish per day. “[The] fish meal goes everywhere, from Europe to Asia and a little bit to Latin America. [The] predominant market is Asia”, the Responsible for quality, hygiene and sanitary safety of fishery products of the factory told me (interview 80).

Figure 17 (left): Photo of a red pandora (Pagellus bellottii) and false scad (Caranx rhonchus) being sold at the landing site for the national and subregional market primarily
(Photovoice participant 4 – Photograph 8)

Figure 18 (right): Photo of a white grouper (Epinephelus aeneus) being sold at the landing site for the international market primarily
(Photovoice participant 4 – Photograph 1)

Among fishers – although this is conditioned by the use of gears enabling them to catch species destined to different types of markets, the European and Asian export markets is seen as the most profitable. As one longline fisher captured on two photographs (figures 17 and 18), during the same fishing trip he caught both white grouper – destined to the Western and African international market, and red pandora and false scad, which are rather destined to the national market. Asked what he would rather like to catch, he told me export-destined species, since these generally have a higher market value – the market value of white grouper at the time of writing lies around FCFA 7000 per kilo, while the value of red pandora and false scad lies around FCFA 1500 and 1000 per kilo respectively.

By way of concluding, I sought in this second subsection to layout the destination of the fish being landed in Joal. Noted was that the fish landed in the town is first and foremost destined to the export-market – both across West Africa and outside the African continent. This export-orientation, I underlined, is particularly facilitated by the presence of multiple factories as well as by the two artisanal fish processing sites, which allow for the important absorbtion of fish landings in Joal, among which sardinella (both *Sardinella aurita* and *Sardinella maderensis*)

constitute the most important species. Finally, I noted that competition is taking place between the local and international markets, which the latter seen more lucrative among fishers.

5.2.3. Politics of fisheries access in Senegalese waters

"The big problem today is one of transparency. Everything is opaque. Everything is blurry. No clarity. And the authority does not want to answer questions" Former fisher; Oceans Campaign Officer with Greenpeace Africa. (Interview 66).

This third subsection outlines the politics of fisheries access in Senegalese waters. As underlined by the above quote, fishing in Senegal is taking place in what is best described as "troubled waters", due to the important lack of transparency surrounding fishing operations in the country's marine waters – not least the operations of the industrial fleet, as mentioned by many my informants. Hence, this subsection outlines the following: sustained fishing agreements between the European Union and Senegal; joint venture agreements and the untransparent attribution of industrial fishing licenses; and the approval of fish meal factories targeting overexploited fish species.

Sustained fishing agreements between the European Union and Senegal

"Us fishers, we always say the State has sold the sea" (Interview 32).

Fishing agreements – defined following Belhabib et al. (2015b) as "the right to access living marine resources (here collectively defined as 'fish') within a host country's Exclusive Economic Zone (EEZ) in exchange for financial compensation" (:4), have for more than four decades provided an important foreign distant-water fleet – "roving bandits" in the words of Berkes et al. (2006), with access to Senegalese waters. Senegal was, in 1979, the first African country to sign a fishing agreement with the European Union (EU) (see EC, 1980). As formulated by Kaczynski and Fluharty (2002), "[a]fter over 15 years of EU–Senegalese 'cooperation' the assessment [was] clearly negative, from both an environmental and social points of view: fish stocks are depleted and the Senegalese artisanal fishery is disrupted" (:2). Resumed in 2006, the agreement between the EU and Senegal was renewed in 2014 (EU, 2014). The agreement however does not address issues of competition between EU-subsidized vessels and the artisanal fleet (Antonova, 2016). An updated version of that agreement was signed in November 2019 (EU, 2019a).

Among my informants, many fishers and fishmongers complained, not only about their unfair competition with boats, but also much about the political underpinnings of their presence – i.e. such fishing agreements notably, as evidenced in the vivid statement above by a retired fisher who continued, "There are demersal fish species, which the artisanal fishers have to catch. Now it is the boats that catch them and bring them to Europe. That is why we fishers are almost dead" (Interview 32). As one fishmonger told me, "We are being told these are agreements on tuna, on hake. This is nonsense! Once the net is thrown into the sea, it will not select what it will catch! These nets are not selective, they catch everything!" (Interview 54). The resulting level of discard by the industrial fleet is important, and was deemed to represent 40% of the total catches landed by the latter operating in Senegal between 1950 and 2010 (Belhabib et al., 2014). Reflecting upon the disproportionate ecological degradation caused by boats, a retired fisher now a fishmonger told me "What they destroy is far more colossal than what they pay" (Interview 23). Equally grave is, in the words of the Executive Secretary of ADEPA, that "agreements are being signed on a species that is overexploited, or stocks that are overexploited. What is also bad is that agreements are being signed without consultation, without participation, without involvement of the main rightsholders of the resource" (Interview 35), namely artisanal fishers, fish processors, and fishmongers. "The government has completely forgotten us", one complained (Interview 46).

In this regard, taken into consideration for understanding the state of marine resources available in Senegal must also be the fishing agreements signed by neighboring countries, not least when these for instance allow the EU's highly subsidized industrial fleet (Belhabib, 2019; see also Sumaila et al., 2019) to target migratory and regionally-shared pelagic fish stocks – specifically sardinella. Both the fishing agreement signed between the EU and Mauritania (EU, 2015), and the latest fishing agreement signed between the EU and Guinea-Bissau (EU, 2019b), two neighbor countries Senegal is sharing fish stocks with must here be noted. Beyond fishing agreements, joint venture agreements, and industrial fishing licenses – for which the attribution process remains in Senegal surrounded with transparency issues and "tainted by murky circumstances" (Greenpeace, 2020:6), constitute another important means to access marine resources within the industrial subsector.

Joint venture agreements and the untransparent attribution of industrial fishing licenses

Joint venture agreements between foreign and domestic companies constitute a critical mechanism under which substantial amounts of marine resources are being extracted from the waters of Senegal. With such agreements, the majority of shares of a boat/company are being held by Senegalese nationals (51%) and the rest by foreigners (49%)[55], who thus operate under Senegalese national law and flying the Senegalese flag on board their ships (see Niasse & Seck, 2011). Often mere "fictitious" or "front" joint ventures (CFFA/CAOPA, 2020) and pervasive in the maritime industry, this "open registry regime" (Campling & Colás, 2017) is also infamous as "flags of convenience", whereby "beneficial ownership and control of a vessel is found to be elsewhere than in the country of the flag the vessel is flying" (Alderton & Winchester, 2002:36). Despite its important contribution to illegal fishing in Senegal (see Belhabib et al., 2014) and for this reason often being denounced (see e.g. Greenpeace, 2015a; Greenpeace, 2015b), also referred to as *senegalization*, the extent of this nationalization process of foreign boats remains in terms of the number of industrial vessels involved, unknown.

Started in the 1990s (Sarr, 2012), the *senegalization* of boats is often considered a result of more limited fishing agreements that do not include pelagic species any longer. A high number of joint ventures was for instance registered following 2006 and the non-renewing of the EU-Senegal fishing agreement. As a former Director of CRODT explained, "Since they couldn't get agreements, people circumvented the legislation. For example, the Chinese, the Turks, what are they doing? They are looking for partners in Senegal to create joint ventures" (Interview 37). As a result particularly of a slippage from fishing agreements towards such less regulated arrangements – no legal requirements exist for observers aboard boats flying the Senegalese flag, illegal catches in Senegalese waters have been found to vary inversely with legal foreign catches, whereby the decrease in the latter is sharply contrasting with the increase in the former (Belhabib et al., 2014) (figure 19). Catches taken by foreign industrial fleets conducting illegal fishing operations in Senegalese waters, are between 2010 and 2015 estimated to having amounted to 261 000 tons per year^{-1} (Doumbouya et al., 2017), while the artisanal subsector has been faced with an overall 30% drop in catches per trip since 1992 (Sarr, 2012). One of the problems, however, with the reflagging of foreign boats through joint ventures is that is entitles

[55] Following the Senegalese Merchant Marine Code. Article 91 of "LAW No. 2002-22 of 16 August 2002 on the Merchant Navy Code", Journal Officiel, Republic of Senegal. Available at: http://www.jo.gouv.sn/spip.php?article1661

the State with responsibilities it does not have the capacity to exercise (CFFA/CAOPA, 2020), not least Monitoring Control and Surveillance (Doumbouya et al., 2017).

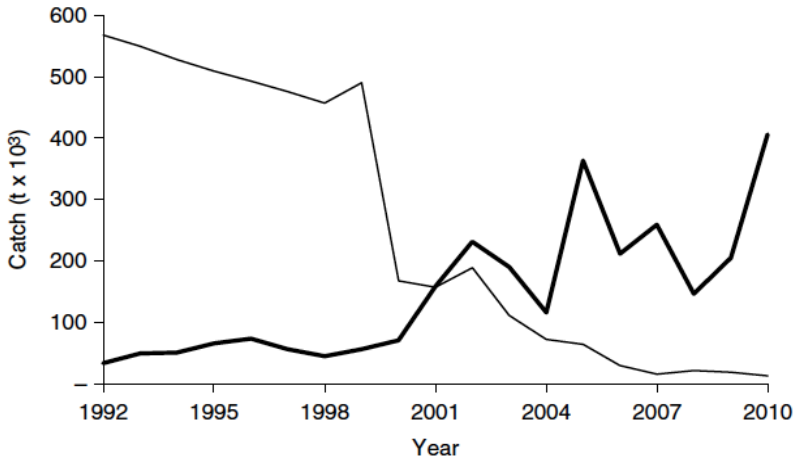

Figure 19: Trends of (reconstructed) legal (thin line) and illegal (thick line) foreign catches from the Senegalese EEZ – 1980–2010
(Source: Belhabib et al., 2014; Belhabib et al., 2017).

Repeatedly making the headlines over the years (see e.g. Vidal, 2012), the issue of the attribution industrial fishing licenses was particularly burning again during April 2020, when in the midst of the COVID-19 pandemic, the Senegalese government considered granting 54 fishing licenses to Chinese and Turkish boats[56] – some of them with a known history of non-compliance and illegal fishing in other waters (see e.g. APRAPAM, 2020; Greenpeace, 2020). This event sparked outrage across the artisanal subsector – an outrage perceptible in the statements of many my informants. Underlining the hiatus between the government's words and actions when it comes to the sustainable management of its fisheries, the President of the Management Committee complained,

> "The State that says 'There is no more fish, we must create marine protected areas', the very same State is granting fishing licenses to boats. It says 'Come and fish, ravage everything, but artisanal fishers, if you fish, we catch you'!" (Interview 75).

It should be mentioned, however, that the Senegalese industrial ship owners – through the GAIPES – have also been vocal against the granting of new licenses to foreign boats. As the President of the Management Committee vis-à-vis their position yet voiced, underlining the

[56] For small pelagic fishing and hake fishing.

persistent contention between the artisanal and industrial subsectors – whether the latter is Senegalese or foreign, “It is the thief who cries out to the thief!”.

Although the government eventually claimed not having granted these fishing licenses, doubt remains prevailing, around what certainly constitutes a sensitive topic. As a fisheries economist from CRODT told me,

> “The Chinese fishery, officially, is not here, I can’t go into that. I can only stick to the official discourse. Although there are allegations from artisanal fishers, I personally cannot comment on this, since I have no proof. But still, there are allegations in this sense, particularly on small coastal pelagic fish. But I do not have any tangible elements” (Interview 38).

The granting of foreign fleet access to Senegalese waters is often motivated by private accumulation among high-level State officials. As a former Director of CRODT underlined,

> “The people who made it possible for Chinese boats to fish here, they did not ask anyone's opinion. They did it by circumventing regulations. They get something out of it. They get something out of it. I'm not going to call it corruption in this country, but it is a grave reality. Grave” (Interview 37).

This situation does not constitute an exception. Indeed, under President Abdoulaye Wade (2000–2012) already, former fisheries Minister Koureiychi Thiam (2009–2012) offered fishing licenses to Eastern European pelagic trawlers targeting small pelagic fisheries, against at the time the fisheries’ Sectoral Policy Letter (*Lettre de Politique Sectorielle*) advocating for the development of artisanal fisheries and promoting food security (Belhabib et al., 2017), which the current one still does (see MPEM, 2016). The issuing, however, of such licenses has resulted in a spike in illegal small-pelagic catches by the foreign industrial fleet (Belhabib et al., 2017:464).

At the time of writing, despite repeated requests from fishers, fishmongers, and fish processors unions, as well as NGOs, the Senegalese government has still not made publicly available the list of boats allowed to fish in the country’s waters, where industrial – particularly foreign – access to, and extraction of marine resources thus remains shrouded with secrecy. In addition to capital accumulation over fines within the JFMPA, fishing agreements and licenses well reflect how primarily relying upon its so-called blue economy, the State is, in the words of a former WWF practitioner, “cashing-in on both fisheries and conservation activities” (Interview 12).

The approval of fish meal factories targeting overexploited fish species

> "The fishmeal factories, if the procedure was followed the way it should be, none of them would be implanted in Senegal" Secretary General of CAOPA/APRAPAM (Interview 76).

A similar lack of transparency is surrounding the installation of fish meal factories in Senegal, apropos which the installation of *Omega Fishing* in Joal, *posteriorly* to the establishment of the JFMPA, reveals yet another hiatus between words and deeds in the State's fisheries policy-making, and particularly in granting access to overexploited marine resources. As the Responsible for quality, hygiene and sanitary safety of fishery products of the factory yet told me with regards to the process that led to the opening of the factory,

> "It is a normal procedure, like all the other factories operating in the fishing industry. You have to issue the plans of the factory, describe what you want to do inside. For example, we have to tell the authorities that we want to produce fish meal. After having provided all this documentation, technicians from the Ministry come to approve the thing, before they give you the authorization" (Interview 80).

A Political Advisor with Greenpeace Africa deplored, "In Senegal, discourse and fishing policies are contradictory. At the beginning of each meeting they talk about resource scarcity, and behind that, they increase the fishing capacity. It is completely contradictory" (Interview 40). In that regard, primarily targeting overexploited small pelagic species, *Omega Fishing* constitutes, with its daily processing capacity of 80 tons of fresh fish, an important strain on marine resources. "When we talk about overcapacity, people very often think of pirogues. But any company, any processing infrastructure, constitutes an indirect fishing overcapacity. These fishmeal companies push fishers to catch more fish to supply them", stressed the Executive Secretary from ADEPA, whilst a former fisher now Oceans Campaign Officer with Greenpeace Africa, considered that

> "It constitutes a direct effort, because the fishmeal factory incentivizes fishers to fish. Because it is when fishers fish more that there is unsold fish. And the factory, in order to live, must have unsold fish. [...] It does not help the resource, it does not help the population, it does not help the women who process the fish, who make a living from this occupation" (Interview 66).

By way of concluding, I sought in this third section to layout the politics of fisheries access in Senegalese marine waters. In this regard, I emphasized the lack of transparency surrounding fisheries access overexploited marine resources, facilitated for industrial fisheries particularly by sustained fishing agreements between the European Union and Senegal, by joint venture

agreements and the attribution of industrial fishing licenses, but also with regards to fish processing infrastructures such as fish meal factories targeting overexploited fish species.

5.2.4. Summary of findings

In this second section, I sought to situates the JFMPA within the broader political economic seascape. As such, drawing upon my empirical findings as well as on secondary data sources, this section layed out the foundations that allow me to further address my second research objective in the discussion chapter.

First, I layout the perceptions of marine resource degradation and scarcity, and the perceived causes and impacts thereof, among artisanal fishers and fishmongers. In that regard, I noted that marine resource degradation and scarcity is perceived as acute among both fishers and fishmongers, and comes with important socio-economic impacts for both their livelihoods, and lives in general. As for the perceived causes of marine resource degradation and scarcity, the industrial fleet is seen by far the main culprit, but not the only one. The artisanal fleet as well, and particularly its overall capacity, is seen by fishers and fishmongers to contribute to the perceived marine resource degradation and scarcity.

Second, I noted the destination of the fish being landed in Joal. The fish landed in the town is first and foremost destined to the export-market – both across West Africa and outside the African continent. This export-orientation, I underlined, is particularly facilitated by the presence of multiple factories as well as by the two artisanal fish processing sites, which allow for the important absorption of fish landings in Joal, among which sardinella (both *Sardinella aurita* and *Sardinella maderensis*) constitute the most important species. Finally, I noted that competition is taking place between the local and international markets, which the latter seen more lucrative among fishers.

Third and last, I outlined the politics of fisheries access in Senegalese marine waters. In this regard, I particularly emphasized the lack of transparency surrounding fisheries access to overexploited marine resources, facilitated for industrial fisheries particularly by sustained fishing agreements between the European Union and Senegal, by joint venture agreements and the attribution of industrial fishing licenses, but also with regards to fish processing infrastructures such as fish meal factories targeting overexploited fish species.

6. Discussion

This chapter unfolds the discussion of my findings against a body of literature pertaining broadly to marine conservation social sciences and maritime anthropology, and particularly political ecology, my analytical lens. In this chapter, the research questions under objective two of this thesis are being answered concurrently with a discussion of my findings and answers to research questions under objective one, as outlined in the previous chapter. Hence in this chapter, drawing in a first section upon Robbins's (2019) "degradation and marginalization" thesis and answering research question 2a., I discuss globalized exploitation and trade, fishing access inequalities, and the political marine resource scarcity (section 6.1). Drawing in a second section upon Robbins's (2019) "conservation and control" thesis and answering research question 2b., I discuss marine space territorialization, artisanal fisheries marginalization, and resistance (section 6.2). Linking in a third section Robbins's (2019) two aforementioned theses through Smith's (1992) "politics of scale" metaphor, and answering research question 2c., I discuss the scalar politics of fisheries management (section 6.3). The chapter ends with concluding comments (section 6.4).

6.1. Globalized exploitation and trade, fishing access inequalities, and the political marine resource scarcity

Implicit in the rationale for establishing the JFMPA for addressing the fisheries crisis that is in Senegal first and foremost hitting the artisanal subsector is a problem framing that emphasizes overfishing and marine resource degradation that would above all be taking place at the local scale. This is in light of this study's findings problematic, particularly when paying closer attention to the broader political economic seascape the JFMPA is nested in, and to the scale(s) at which both marine resource exploitation and trade are taking place. At the same time, the inherent spatial nature of the JFMPA does not address the overall overcapacity of the fishing fleet – which yet remains the main underpinning of overfishing and marine resource degradation in Senegalese waters (Belhabib et al., 2014), and overshadows the exploitation-and-trade side of the issue at stake.

The overcapacity of the fleet operating in Senegalese waters and the resulting overfishing and degradation of marine resources is politically produced. As my findings underline, and as noted by Brown (2005), the Senegalese State continues favoring short-term financial gains from fishing agreements – used not least for debt repayment and the financing of State administration, over a more long-term support to its domestic artisanal fleet, which it proves difficult to extract revenue from. Let alone elite capture at the highest levels of the State in granting industrial fishing licenses through dubious arrangements, blaming Senegal for continuing to sign social-ecologically unsustainable fishing agreements with the EU would however be dramatically overlooking the power imbalances predicating patterns of trade and exploitation (Childs & Hicks, 2019:329) and particularly the (neo-)colonial nature of these imbalances (Mansfield, 2011; Antonova, 2016:82). Across Africa indeed – including in Senegal, the power structures in the current moment defining the relationship between the ocean and the global political economy are inseparable from the historical legacies of colonialism (Childs & Hicks, 2019:327). Envisioned as part of an unidirectional system of communicating vessels, the current overcapacity of the growing Senegalese artisanal fleet deplored by many my informants must be seen the result of the EU's persistent need for, and ability through fishing agreements to redistributing its own structural excess fleet capacity in Senegalese and West-African marine waters at large (see Brown, 2005; Antonova, 2016), which have turned to become a real "fish basket" for the global fish market (Alder & Sumaila, 2004).

The remunerative power of actors such as the EU, exemplified in its long-standing engagement with fishing agreements, and increasingly China, through less "legal" means surely (of which the extent remains yet poorly assessed due to lack of transparency) certainly does have an influence on what the Senegalese State is willing or not to commit to vis-à-vis the marine resources in its EEZ. Besides underlining the diversity of existing accumulation strategies in fisheries and the central role of access to capital in mediating access to fisheries (Campling et al., 2012:183/193), fishing agreements, joint-venture agreements, and industrial fishing licenses constitute in Senegal, due to the way these are being negotiated, signed, and issued, that is without or with only little participation or consultation of the principal group impacted, artisanal fishers, forms of ocean grabbing (see Bennett et al., 2015). Perhaps worth then rising here again is the rhetorical question asked by the APRAPAM, which could not be more valid in face of this study's findings: "*In what language could artisanal fishers be told to reduce their catches or even stop fishing if, at the same time, licenses are being issued to industrial vessels with a very large catch capacity?*" (APRAPAM, 2016; emphasis added; own transl.).

The preceding in turn begs for scrutinizing the Malthusian overfishing narrative when it comes to a fleet's overcapacity, and particularly the perceived overcapacity by artisanal fishers of their own fleet. While this much attests to the self-reflectiveness of the artisanal subsector upon its own ecological impact – a self-reflectiveness less likely to be found within the "bulldozer" industrial subsector, which constitutes an important foundation in the process of enhancing the ecological sustainability of the artisanal fleet, the perceived overcapacity by artisanal fishers of their own fleet may also hide a more concerning issue. Indeed, much echoing Pauly's (1988) afore noted phrasing "too many fishermen chasing too few fish" (:15), the employ of such explanations by fishers particularly, the very group commonly marginalized most by such narratives and their translation into politics – not least through the implementation of MPAs (Finkbeiner et al., 2017), might be seen the expression of their perceived powerlessness in removing a bigger thorn from their side, i.e. the illegally operating industrial fleet, best described as the "the plague of West Africa" (Belhabib et al., 2015a:328).

Apropos Malthusian overfishing must be emphasized, "a big elephant in the room is the industrial sector" (Dyhia Belhabib, pers. comm.). In comparison indeed to the 80%-90% suggested by official data, artisanal catches in Senegal were found by Belhabib et al. (2014) to be responsible for only 50% of the total extractions over the past 60 years, allowing for concluding that the industrial fleet – of which the overall size of the fleet remains surrounded with secrecy, is a direct cause for the perceived overcapacity of the artisanal subsector, and not least for the degradation of marine resources in Senegalese waters. This, however, is all the more problematic when comparing the numbers of industrial boats officially operating in Senegalese waters, with the high the number of pirogues. As underlined in my findings, many fish workers within the artisanal subsector in Joal consider themselves being robbed of "their" marine resources by foreign boats and, all the more critical, of their livelihoods. This is in turn deeply concerning given the high – yet in fine officially unassessed – number of people depending on artisanal fisheries for their lives along the value chain in Senegal and beyond, across West Africa. The important reliance in the region on fish, caught by the artisanal rather than the industrial fleet, in this regard further calls for reconsidering blunt statements such as "we must treat fish not as seafood, but as wildlife" (Monbiot, 2021) in different social, ecological, and cultural contexts.

Finally, the degradation of marine resources in Senegal, which the JFMPA seeks – concurrently with other spatial interventions – to address must be seen driven by multi-scalar patterns not

only of exploitation, but also of trade. Not only do industrial fisheries generally first and foremost supply (more or less) wealthy consumers in the Global North (see Swartz et al., 2010; Mansfield, 2011), but the main destination of the artisanal catches landed in Joal is far from being the town only. Rather, it is of increasingly export-oriented nature as well. In that regard, one might also see a somewhat striking juxtaposition of a fisheries management/conservation space just off the most important fish-landing site of Senegal, near which export-oriented factories incentivize fishers to fish more, with the aim to supplying distant markets. Among these factories, the establishment of *Omega Fishing* particularly, driven by the swift growth of the global aquaculture industry in face of world marine captures' stagnation since the late 1980s (FAO, 2020), in my view much epitomizes the contradictory fisheries management/conservation and economic geographies in and off Joal. A contradiction, which prevail in fisheries management/conservation decision-making. The aforementioned multi-scalar political economic fisheries seascape all together begs for paying closer attention, as emphasized by Finkbeiner et al. (2017), to fishing technology and power, demand and distribution, as well as governance, among other crucial mediating drivers of overfishing and marine resource degradation.

My findings finally underline the importance of popular perceptions of scarcity (see Mehta, 2001) among my informants apropos marine resources in Senegalese waters. A matter in the case under study first and foremost of inequality in resource access and allocation against the industrial fleet operating in Senegal – whether legally, barely legally, or illegally, the resource scarcity much mentioned by fishers, fishmongers, and other informants must be seen as the result of more powerful actors able to get away with resource appropriation while at the same time aggravating degradation (see Mehta, 2010:116). Indeed, industrial boats find themselves, having or not the legal authorization, able to access marine resources and fishing grounds often at the expense of artisanal fishers, which have been and remain outcompeted at sea. While each fishery – artisanal and industrial – due to the very competitiveness over marine resources and space, experiences pressure from, and exerts pressure on the other, as evidenced in this study, uneven power relations in access result in an inequitable distribution of both fisheries-related wealth and conflict at sea[57] (see Campling et al., 2012:187). Underpinned by issues of access,

[57] Note however that the emphasis in this study on conflict between the industrial and artisanal subsectors should not naively overlook the existence of collaborative interactions at sea such as illegal transshipments of fish from boats to pirogues – which landed as artisanal catches supply markets inland Senegal, thus calling rather for what Sall and Nauen (2017) describe as a "fluid distinction between [artisanal] and industrial fisheries along the value chain" (:614).

inequality and historically contingent power relations over the marine environment, the scarcity much noted by many of my informants must in the case under study thus be envisioned political (see Scoones et al., 2019). As a fishmonger once expressed at the fish-landing site, "We are the continent that lacks nothing and lacks everything" (Interview 52).

6.2. Marine space territorialization, artisanal fisheries marginalization, and resistance

Seen through the prism of the conservation and control thesis (Robbins, 2019), the JFMPA constitutes, beyond a (paper) co-management arrangement, a form of "regulation by territorialization" (see Bassett & Gautier, 2014). The ongoing territorialization of the marine space taking place along the Senegalese coast through the establishment of MPAs and other spatial interventions, is part of a broader global movement of enclosures over the marine domain and its emphasis on carefully delimited regimes of property rights conditioning access to marine resources (see Mansfield, 2004; see also Peluso & Lund, 2011; Campling & Havice, 2014). It is yet inapropirate, as Artaud (2018) underlines, to envision marine space and the complex relationships of non-Western societies to their marine environment through a property lens. The ocean and its agents, indeed, both human and non-human, do not conform to the "jural forms" that dominate on land (Bear, 2013; Campling & Colás, 2017:7), not least to protected areas. Such territorialization processes being unfolded over the marine space rather serve the interests of powerful actors.

Co-management is often being advocated as a solution for the sustainable management of fisheries *and* the empowerment of fisherfolk communities altogether (see e.g. Pinkerton, 1989; Jentoft, 2005; Berkes, 2015), and participation in MPA governance in Senegal does indeed constitutes "an ethical imperative" (Cormier-Salem, 2014). Yet, my findings underline how participation was from early on, and still was at the time of fieldwork instrumentalized, as part of the co-management arrangement of the JFMPA. Unsealed, as previously noted, this arrangement is, rather than one effectively devolving authority to the fisherfolk, one allowing the State to co-opt local autonomy (see Singleton, 2000). This problematic co-opting within the JFMPA begs for questioning the merits of such decentralized fisheries management/conservation interventions, particularly if co-management is to remain the predominant approach to fisheries management in Senegal – as formulated in the country's

national strategic vision for MPAs. In the case under study, my analysis further underlined the vested interests of both the State and international environmental NGOs in shaping the current form of co-management arrangement that underpins the territorialization process of the marine space off Joal. Managed like a park, and indeed by means of a paper co-management arrangement, the JFMPA allows the Senegalese State to further police ocean waters that were by law already under its territorial control (see also Chmara-Huff, 2014:11).

The use of such internal territorialization processes that coercively exclude fishers from their traditional fishing grounds, must in Senegal be seen motivated by a fairly limited de facto control by the State of its marine waters and fishing activities that are taking place beyond the boundaries of MPAs. The territorialization of the marine space by the JFMPA is furthermore motivated by an economic interest, insofar as the it ensures a financial revenue to the State through the fining of non-complying fishers, while also providing international environmental NGOs with an operational space for implementating projects through the MPA Management Committee. Financially-motived internal territorializations such as that anlyzed in the case study of the JFMPA have historically be common (Vandergeest & Peluso, 1995). The use of the JFMPA by the State with the support of environmental NGOs as a means to accumulating wealth by fining artisanal fishers infringing upon regulations at sea in that regard reflects a process that has thoroughly been scrutinized by political ecology scholarship (Adams & Hutton, 2007; Kelly, 2011; Benjaminsen et al., 2013). Dispossessions of artisanal fisherfolk from their fishing grounds and resources as noted in this case study are indeed common with the implementation of spatial fisheries management/conservation interventions (see e.g. Benjaminsen & Bryceson, 2012; Kamat, 2018), and must be seen constituting forms of ocean grabbing (see Bennett et al., 2015), yet again.

The territorialization of the marine space by the JFMPA underpinning this other ocean grab is however not fully effective, and thus best described as incomplete. This incompleteness is exemplified in the non-compliance with the regulations of the JFMPA, which constitutes a clear marker of disruption by fishers of the State's territorial strategy over the marine space (see Vandergeest & Peluso, 1995:391). Despite the regulations, many fishers pursue their fishing activities illegally – either individually or collectively organized. The continuation of banned livelihood practices and its latent challenge to conservation constitutes a central aspect of resistance to such interventions (Holmes, 2007:193), which is frequent among resource-dependent communities in the face of exclusions from, and dispossessions of resources and

land/ocean space (see e.g. Benjaminsen et al., 2013; Chmara-Huff, 2014; Hall et al., 2015; Raycraft, 2020). Whatever the "everyday forms of resistance" (see Scott, 1985; 1990) evidenced in my findings (e.g. individually taking a chance to fish witin the JFMPA; collectively monitoring the outings of the surveillance patrol; taking advantage of bonds with one of its members; or engaging in corruption when caught) these reflect considerable agency among fishers, both individually and collectivelly, in the pursuit of their livelihood in the face of the State/NGO-led territoralization of the marine space.

As noted in my findings, non-compliance among fishers is explained by the perception of scarce marine resources beyond MPA boundaries, by the establishment of the JFMPA over traditional fishing grounds, and by the unclear demarcation of its boundaries at sea. With regards to non-compliance – or "poaching" – as a form of resistance (see e.g. Bell et al., 2007), my findings however beg for not assuming resistance to be the main motivation for the illegal exploitation of marine resources within the JFMPA, but to envision resistance – as well as the implicit protest inherent to it – as being driven by material needs and necessity foremost among fishers (see Kull, 2004; Holmes, 2007:193). Fishers' non-compliance – both individual and collective – with the JFMPA is indeed in part underpined by the problematic production, through boundary-making, of an inside/outside dichotomy inherent to the production of conservation spaces (see Roth, 2008), with the former perceived resource-abundant and the latter perceived resource-scarce by fishers. The political and livelihood motivations being best seen as intertwined in the illegally pursued fishing activities of fishers within the JFMPA, the wording "implicit resistance" (Holmes, 2007:193) seems, beyond that of everyday resistance (Scott, 1985; 1990), particulalry well-suited to the case under study.

Non-compliance, and thus fishers' resistance is, as reminded in the preceding, further underpined by the overlay with the JFMPA of traditional fishing grounds. In this light, discussions taking place between fishers and State representatives over fines when the former are being caught fishing within the JFMPA, more than grounded in the "sole" financial concerns of fishers over the cost of the transaction, much underscore the negotiations of the regulations. What this in turn evidences, is the persistent negotiation and calling into question of the territorialization of the marine space by the JFMPA, and of the very foundations underpinning this territorial claim by the State supported by international environmental NGOs. In Senegal, as noted by Sall (2007), "where the state is not the only source of power – the other two being tradition and religion – communities customarily infringe laws by opposing 'power of culture'

to ‘culture of power’” (:181). In face of both the vibrant culture of the artisanal fisherfolk and the politically encouraged industrial exploitation of marine resources beyond MPA boudaries, its seems unlikely that territorializations of the marine space through MPAs or other spatial interventions – no matter how ecologically imperative – would ever be fully effective along the Senegalese coastline, particularly when their co-management only is one on paper, and as such casts fishers out of the decision-making frame.

While the incomplete territorialization of the marine space by the JFMPA is evidenced in the actions of fishers, it is however also both the result of, and (non)materialized through the lack of buoys and poor demarcation of MPA boundaries at sea, as noted in my findings. This evidences how, as noted previously by Raycraft (2019) in a different geographical context, marine space territorialization by means of MPAs is in practice firmly constrained by limited financial and management capacity at the implementation level. Or as Peluso and Lund (2011) stress, “the long term ‘stickiness’ [of enclosures] depends on more than law” (:674). As emphasized earlier, the State is indeed not the only actor involved in the territorialization of the marine space by means of the JFMPA. While the JFMPA was legally enacted by decree, its operationalization at sea is much contigent upon financial support from international environmental NGOs, which were involved in both promoting the JFMPA and technically and financially supporting its implementation from 2004 onwards. Reflecting the active use by international environmental NGOs of territorial politics and practices to de-center State power (Peluso, 2005; see also Pochet, 2014), the strong footing of such private organizations at the local management level of the JFMPA is deeply concerning, given that their agendas often have only little consideration for the people that will be impacted most by their activities – here fishers.

The incompleteness of the territorialization of the marine space by the JFMPA does however imply – if now envisionning the glass half-full instead of half-empty – that the territorialization is indeed to some extent effective as well. This, indeed, is not only evidenced in the ability of the State to effectively exert its power within MPA boudaries by fining fishers, but also in the spatial squeezing underlined in my findings and inscribed in a global trend (see e.g. Cohen et al., 2019), of the growing artisanal fleet between the JFMPA and other spatial fisheries management/conservation interventions, and the industrial fleet au large. Reflecting how territorialities, not only State-driven but also produced by everyday practices “are clashing all over the place” (Peluso, 2005:2), the marine territorialities of the artisanal and industrial fleets

particularly, have long been encroaching one another at sea, with yet the social, ecological, and economic costs generally incured by the artisanal fleet. Problematic in that regard, however, is that the internal territorialization of the marine space by the JFMPA – and other spatial fisheries management/conservation interventions – is unfolding in the zone that by law is "reserved" to artisanal fishers, thus again first and foremost impacting them. Hence, while the State and environmental NGOs are the winners of the territorialization of the marine space by the JFMPA, artisanal fishers are, further marginalized, the ones losing most. As for industrial fisheries, the fleet overall remains unbothered in its operations.

6.3. The scalar politics of fisheries management

Important is under this final section to highlight the linkages of the preceding discussion through Smith's (1992) "politics of scale" metaphor – which implicitly underlies the two previous sections, as a means to unveil why the local scale, inherent to the JFMPA, is the one favored for addressing overfishing and marine resource degradation in Senegalese waters. In the country, the favoring of spatial fisheries management/conservation interventions such as the JFMPA remains today underpinned by a technocratic vision of fisheries management, which has only little regard for socio-anthropological considerations of the impacted fishing communities (Cormier-Salem & Mbaye, 2018:8). As a result, including intra-community heterogeneity, which is often only poorly appreciated and accounted for in the context of natural resource management and not least fisheries (see Agrawal & Gibson, 1999; Jentoft, 2000), is unfortunately being overlooked.

The consideration with the implementation of the JFMPA for the conservation of bio*diversity*, as currently being emphasized as part of its management, seems in this regard to be starkly contrasting with the uniform treatment of the multiple human uses of the marine environment now under protected status (see Katz, 1998:49). This issue is, beyond resulting from a scuffle over incompatible conservation and fisheries management objectives, underpinned, following MacDonald (2005), by an understanding of biodiversity as ontological, which transcends differences across contexts. This, yet, is particularly unsound in the very context of the case under study. Indeed, while international conventions driving the local implementation of MPAs envision biodiversity as natural heritage – and indeed as ontological – and call for its "patrimonialization" (Cormier-Salem, 2006), fishers in Senegal – tinted with a certain

"ecological fatalism" – see biodiversity loss being part of normal trials and tribulations of non-human nature conditioned by powers beyond the reach of humans (Sall, 2007).

In this regard, the operationalization of the local scale for fisheries management, inherent to the JFMPA, is furthermore underpinned by the desire of Senegal to meet its national objectives in commitment to global areal biodiversity conservation targets. For another, international environmental NGOs, which have a strong operational footing in the JFMPA, indeed both rely on, and produce a representation of ecological space as "global" with the aim of attaining their trans-local political-ecological goals (MacDonald, 2005:261), hence simultaneously constructing new, and defending multiple scales, particularly around MPA advocacy and implementation (Gray et al., 2014:78). The implementation of the JFMPA must in that regard be seen underpinned, beyond by the mere rent-seeking interest of the State – by one of the scalar narratives prevailing during Conferences of the Parties to the CBD, which Gray et al. (2014) describe as "a local narrative in support of locally managed MPAs" (:66). An MPA indeed proceeds with the production and compartmentalization of non-human nature at the local scale. The result thus, as evidenced in this case study and well-formulated by Artaud (2018), becomes a problematic contention "between a 'local' sea, which can only be understood through its cultural, symbolic, embodied or affective underpinnings, and a 'rational' sea, constructed as a space to be administered by global policies of resource conservation" (:19). The "scaling up" (Finkbeiner et al., 2017:1188) of such local spatial solutions ignoring the realities of artisanal fishers at sea results in inappropriate social outcomes, as underlined in my findings with the spatial squeezing of the fleet.

Seen through a geography-centered political ecological lens (Zimmerer & Bassett, 2003), my findings indeed illustrate the critical importance of the JFMPA's spatial hold for understanding its impact on the artisanal fishery, resulting, through territorialization, from the setting – as part of a broader maelstrom of spatial transformations (Swyngedouw, 2000:66), of marine resources into what may be seen a new regime of space (MacDonald, 2005:279). This seems in the case under study particularly problematic in face of the different types of fishing gears in use and their associated appropriation[58] of the marine space. At sea indeed, as previously emphasized by Dahou (2010) vis-à-vis Senegalese artisanal fisheries, diverse forms of marine resource exploitation have for corollary diverse modes of appropriation of the marine space. In this

[58] With respect to the ways some communities relate to the marine space, the concept of "appropriation" is best envisioned a form of mutual belonging (Artaud, 2018).

context, abstract spatial forms of territorial fisheries management/conservation interventions such as the JFMPA come to starkly contrast the spatial complexity of local livelihood practices (see Roth, 2008:375), and will – no matter how "co-managed" on the ground, only poorly fit diverse artisanal fisheries. As previously noted by Aswani (2018) in the context of artisanal fisheries in Melanesia, MPAs based on rational economic or ecological motives do not harmonize well with preexisting historical or cultural appropriations of the marine spaces.

All the more problematic, the use and scaling of local fisheries management/conservation interventions such as the JFMPA for addressing overfishing and the degradation of marine resources in Senegal, occults the aforementioned ecological impact of the industrial fleet au large (see again Belhabib et al., 2014), which through different already outlined means, sees itself granted with a sustained access to coveted fishing grounds. Embedded socio-political enterprises (Jentoft et al., 2007; Chuenpagdee et al., 2013), MPAs, as noted by Ramesh and Rai (2017) in a different geographical context, indeed obscure the impacts of industrialized extraction that is taking place within the wider seascape, while exacerbating socioeconomic inequalities between and within the here artisanal fisheries subsectors. The intent is with this perspective not to overlook the ecological impact of the growing Senegalese artisanal fleet. But rather to unveil the way that the JFMPA, envisioned a local scale territorialization of the marine space, well exemplifies the ways States use regulatory capacity to generate outcomes that privilege some actors over others within fisheries (Campling et al., 2012:195), as a means in this context to secure "blue revenue".

Rather, thus, than "the 'hollowing out' of the national state" (Swyngedouw, 2000:68), the national domain indeed remains prevailing (see Mansfield, 2005) with regards to the scaling internal fisheries management/conservation territories such as the analyzed JFMPA, as part of the State's political economic deeds and needs vis-à-vis the marine resources in its EEZ. The sustained engagement of the Senegalese State with fishing agreements and other forms of exploitation and trade arrangements as well, evidences the importance of the national domain in the unfolding of the scalar politics of fisheries management. As Campling and Havice (2014) remind us, the State remains the "owner" of marine natural resources within EEZs. My analysis in this regard, through which I concurrently scrutinized the implementation of the JFMPA and what this local scale intervention entails for fishers, together with the broader political economic seascape this intervention is nested in, well reflects, following Boyle (2002), "the power of the developmental state to junk, rejig, recalibrate, modify, and transform the existing

scale division of the state in defense of the chosen accumulation strategy" (:191). Or as Smith (1992) put it, "social domination exercised through the exploitative and oppressive construction of scale" (:78). In this very case the social domination of artisanal fishers in the pursuit of their livelihoods.

7. Conclusion

This final chapter concludes my research of the case study of the Joal-Fadiouth MPA. The chapter is outlined in the following manner. Subsection 7.1. will remind the reader for the objectives and research questions – and analytical lens, outlined in the beginning of the thesis, before continuing to subsection 7.2. which summarizes the main findings of the research. Subsection 7.3. lays out succinct concluding comments, and finally, subsection 7.4. advances possible avenues for further research in line with findings from the case study of the Joal-Fadiouth MPA.

7.1. Objectives and research questions

Firstly, this study has sought to examine the implementation of the JFMPA as a fisheries management intervention and its impact on artisanal fishers. Secondly, with this study I have endeavored to situate the JFMPA within the broader political economic seascape, with the aim to unveil why the local scale, inherent to this fisheries management intervention, is the one favored for addressing overfishing and marine resource degradation in Senegalese waters.
To do so, the scope of the study has focused on answering a set of questions for each of the two objectives.

Towards the first objective, with the intent of providing an account of the implementation of the JFMPA as a fisheries management intervention and its impact on artisanal fishers, the following three questions were asked: *How is the JFMPA being managed and operationalized? What consequences does the JFMPA have for artisanal fishers at sea? What are the reasons behind non-compliance with the JFMPA among artisanal fishers?* These questions and relevant findings were particularly emphasized and discussed in the findings chapter (chapter 5), given that much of the findings from my fieldwork in Senegal was indeed particularly relevant towards these questions.

As a second step, in view of the second objective of situating the JFMPA within the broader political economic seascape and to unveil why the local scale, inherent to this fisheries management intervention, is the one favored for addressing overfishing and marine resource degradation in Senegalese waters, the research questions were the following: *What are the*

causes of marine resource degradation and scarcity perceived by artisanal fishers and fishmongers? Who are the "winners" and "losers" as a result of the territorialization of the marine space by the JFMPA? Why is the local scale, inherent to the JFMPA, favored for addressing overfishing and marine resource degradation in Senegalese waters? As the second objective and questions were of a more analytical nature (than the first objective and questions), I have particularly attempted to answer these in the discussion chapter (chapter 6) through the combination of results from the field and the analytical lens utilized for this study – the "degradation and marginalization" thesis and the "conservation and control" thesis, which I finally linked through an emphasis on power relations over the marine environment and their expression, drawing upon the "politics of scale" metaphor, in scalar politics.

7.2. Summary of findings

Currently being implemented like a park, as opposed to the sustainable use MPA it is described as in its internal regulations, the JFMPA constitutes in the current moment a form of coercive marine conservation intervention. This is particularly the result of the unsealed co-management arrangement between the State and the Management Committee that represents the fisherfolk community. Through this paper co-management arrangement, the State is co-opting local autonomy in a rent-seeking behavior and asserting its power over its marine waters, which it has beyond MPA boundaries only limited de facto control over. At the same time, the JFMPA provides international environmental NGOs with an operational space for project implementation, which in practice enables these organizations to steer the management of the JFMPA according to their biodiversity conservation agendas, while also benefiting an influential and powerful local elite.

The JFMPA furthermore participates, due to its inherent spatial nature, in increasing the spatial squeezing of the growing Senegalese artisanal fleet at sea – a globally observed trend in face of the increasing competition between a broad range of actors over both marine spaces and resources. The spatial squeezing of the artisanal fleet which arises from this study's findings, is, besides from the JFMPA along the coast, the result of the presence of industrial boats au large – whom artisanal fishers compete with for both marine space and resources, of the competition and conflicts over marine space within the artisanal subsector between fishers using different fishing gears, and of the growing areal hold of other spatial fisheries

management and/or conservation interventions being implemented along the *Petite Côte* particularly. Through this spatial squeezing, the artisanal fleet finds itself all the more marginalized, and this despite its considerable contribution to employment in Senegal, and to food security in the country and beyond.

The territorialization of the marine space by the JFMPA, however, is only incomplete. Indeed, demonstrating considerable agency in the pursuit of their livelihoods, artisanal fishers do not just blindly abide by MPA regulations and do pursue their fishing activities within MPA boundaries, either individually, or collectively organized, by different means of everyday resistance. These include individually taking a chance to fish witin the JFMPA, collectively monitoring the outings of the surveillance patrol, taking advantage of bonds with one of its members, or engaging in corruption when caught. This non-compliance with regulations, my findings underline, is explained particularly by a perceived scarcity of marine resources beyond MPA boundaries, by the establishment of the JFMPA on traditional fishing grounds, as well as by the unclear demarcation of the JFMPA at sea.

The scarcity of marine resources beyond MPA boundaries noted by many among artisanal fishers, fishmongers, and representatives of multiple institutions involved in fisheries, is perceived as acute, and coming with important socio-economic hardship for the artisanal subsector as a whole. Marine resource scarcity is perceived to be first and foremost the result of the operations of the industrial fleet, as well as to a lesser degree from the artisanal fleet, and in that regard particularly from what is perceived as its overcapacity. An analysis of the broader political economic fisheries seascape that the JFMPA is nested within allowed me to conclude that the scarcity perceived among the fisherfolk community and representatives of relevant institutions is of political nature. This political scarcity is conditioned first and foremost by unequal power relations over, and access to marine space and resources, underpinned particularly by the presence of an industrial fleet facilitated by different long-standing mechanisms including fishing agreements between the European Union and Senegal, joint-venture agreements, the untransparent attribution of fishing licenses – all elements as a result of which the overall capacity of the industrial fleet is Senegalese waters remains unknown, as well as the approval of fish meal factories targeting overexploited fish species.

In this context, artisanal fishers yet find themselves being the ones losing most from the territorialization of the marine space by the JFMPA, a territorialization which benefits the State

as well as international environmental NGOs, while leaving the industrial fleet unbothered au large – when not encroaching into the zone(s) forbidden to its operations. In light of the preceding, I have found the JFMPA to constitute an expression of scalar politics, whereby the local scale is the one being operationalized for fisheries management and addressing overfishing and the degradation of marine resources in Senegalese, as a means to allow the State for accumulating from both conservation and extractive zones concurrently.

7.3. Concluding comments

MPAs continue today being the favored tool for both conservation and fisheries management worldwide – and indeed often seek to address both objectives simultaneously. This is particularly so along the coast(s) of Senegal, of West Africa, and of the African continent at large. As evidenced in this study, the implementation of such tools proves yet problematic given the way such spatial interventions not only impact predominantly resources-dependent communities, but also are being co-opted by State authority as a means to expanding its control towards the maritime domain, where yet incredibly more powerful actors are plundering the oceans with impunity. This is of course not to say that the artisanal fleet does not cause any harm to marine ecosystems. Rather, this calls for more political ecological research on the power imbalances that shape access to marine spaces and resources, and which in turn aggravates the degradation of marine ecosystems – and here very anthropocentrically, at the expanse of coastal developing nations that depend most on good fish their daily lives. While much emphasis was in this study put on transparency issues within fisheries in Senegal, this should not obscure the lack of transparency surrounding much of the operations of the European, Chinese, and Turkish fleets at sea.

7.4. Further research

Multiple avenues for further research in my view open up in light of this study's findings.

At the local scale, first, interesting seems in my view to further investigate the forms of fisheries management systems – such as *qawes* – pre-existing to the establishment of modern forms of spatial management interventions, such as MPAs, and particularly the very juxtaposition of two such spatial yet different management systems. Still at the local scale, a crucial avenue for

further research is in my view artisanal fishers' multiple means of everyday resistance in face of ocean grabs by powerful actors. This should not be limited to resistance to MPAs, but also resistance to, and any physical interactions with industrial fisheries at sea. Not so much for the sake of sensationalism, but simply because just like fishers' practices, conflict at sea is too often – and I unfortunately somewhat did so myself in this study, treated as one homogenous phenomenon, although multiple forms of conflicts, conflictual interactions, and simply interactions take place at sea within the artisanal subsector, and between the artisanal and the industrial subsectors[59].

In the same vein, more micro-local research is in my view needed vis-à-vis the interactions between fishers and surveillance patrols within MPAs, which as noted in this study are often composed of local fishers as well, thus allowing for particular arrangements. While I did not have the time to delve myself into the topic while in Joal, the micro-politics around this issue certainly call for attention, given the frustration that arouse around it among fishers. More research is furthermore needed on the role of NGOs by different means interfering in the management of MPAs. Finally, while I have noted the conflict around incompatible fisheries management / conservation objectives, more research – and here perhaps best of quantitative nature – is in my view necessary for assessing the "livelihood benefit" component of such interventions, which is often taken for granted and not least used to advocate for the implementation of new MPAs among fishers.

At the broader scales, more research is in my view needed around fishing agreements, the attribution of industrial fishing licenses, as well as the creation of joint-venture agreements, all processes of accumulation by powerful actors at the expense of the artisanal subsector. In this regard, although probably complex due to the sensitive and much political nature of the issue, a quantification particularly of joint-venture agreements existing in Senegal – and other countries of relevance is needed. Important in that regard would be to involve fishers in such research, given that these are probably well-informed given they encounters at sea with boats that should not be operating in Senegalese waters. Furthermore, more critical research is needed in order to quantify the "benefits" of fishing agreements for developing and developed nations.

[59] I wish to note one last fieldwork memory: one fisher whom with I discussed conflicts at sea with industrial fisheries during a photovoice focus group discussion for instance told me over one photograph, that during the 5-days squid-fishing trip he had last done with other fishers off The Gambia, his group on day had to ask one boat passing by for fish, in order to feed themselves because they had not been able to catch anything for 24 hours and no more supplies.

Finally, I mean to conclude with a note on research methodologies. Engaging ocean-focused political ecology research with more participatory methodologies, where context- and research-focus-relevant, as I have sought to apply as part of this research with photovoice, is in my view crucial for as much as possible engaging study participants and diversifying knowledge sources. In this regard, participatory mapping particularly – a method I have had in mind myself for the conduction of this very research – would in my opinion be well-suited as means to better grasp the complex relations that diverse artisanal fisheries have with the marine environment, not only in Senegal, but also in different geographical contexts. While this could constitute an interesting methodology for studying interactions at sea, as noted above, it would in my view particularly important given the traction around much political processes such as marine spatial planning for guiding integrated coastal management, and as part of it, the establishment of coastal MPAs. In these processes, artisanal fisheries and their social-ecological relations are often threated as homogenous, when not simply ignored.

8. References

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