



Senegal's fisheries policies: Evolution and performance

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ABSTRACT

In 2016, Senegal's fisheries contributed 14.63% of total value of export earnings, representing 3.2% of Gross Domestic Product and employed an estimated 600,000 people, of which 30% were women. It is very important for Senegal to establish an effective policy system and protect its valuable fisheries resources. To realize this goal, scientists, government officials, and related parties should critically reflect upon fisheries policies and their performance. Given the high institutional instability in the country, this paper discusses the various policies adopted during different Senegalese political regimes, their evolution, and their implementation. This study also assesses how these policies impacted the availability of fishery resources in the country, and changed fishermen's behavior and income. We find that although some policies are effective, the overall policy system is still in dire need to be improved, as fisheries are still experiencing a downward trend due to illegal fishing and overfishing. We also find that the motorization of pirogues contributed to increasing the catch volumes and the extension of fishing areas. However, the signs of declining volumes of landings noted in the 1981s prompted the authorities to take advantage of specific management measures and regulations for the protection and restoration of habitats and overexploited marine resources. We propose a model of policy formulation based on stakeholder theory that deals realistically with issues of over-exploitation and illegal fishing, where all the interested parties should strongly participate in the decision-making process.

1. Introduction

Most Western African countries have similar aims in their fisheries legislation and regulation (Begg et al., 2014), which today has the overarching objective of implement strongly anchored policies to protect their fisheries resources. Following the same path, Senegal established some policies to achieve this goal since its independence from France in 1960 (Ferraro et al., 2011). These policies are based on management measures (e.g. fishing method limits, co-management, and artificial reef immersion), and regulations (e.g. fishing rights, national registration program of pirogues, and vessels restrictions) for fishing activities and access to fishery resources in the waters under Senegalese jurisdiction, including coastal areas (Fig. 1).

From the 1970s–1980s, the policies (including the motorization of pirogues) focused on the development of the artisanal sector, as well as food security. Hence, the institutional instability meant that the objectives underlying fisheries policies have changed over time. From development to the sustainability of resource used, to food security and social goals. Today, although the artisanal sector has a major contribution with regards to these objectives, there have always been challenges to effective policy implementation in Senegal.

Although a series of fisheries policies have been established by Senegal, political, socio-economic, biological, and technological conditions governing and related to fishing activities changed rapidly in the past 26 years. In addition, Senegal's coast has significant cultural diversities, ethnicities, fisher *metiers* and communities that affect policy choices, priorities, and implementation capabilities (Chauveau and Samba, 1989; Cormier-Salem, 1995; Niang, 2009). Therefore, fishery resources policies encountered many problems which influenced the decline of those highly valued species such as groupers (e.g. *Epinephelus aeneus*) and demersal (e.g. *Pagellus bellotti*, *Octopus vulgaris*, *Farfantepenaeus notialis*, *Loligo vulgaris* and *Cynoglossus* spp). The International Union for the Conservation of Nature (IUCN), concerned about the state of stocks of *Epinephelus aeneus*, has classified the species in the endangered category of its red list. Moreover, *Pagellus bellotti* is on the category of low concern (LC) and other demersal species such as *Octopus vulgaris*, *Farfantepenaeus notialis*, *Loligo vulgaris* and *Cynoglossus* spp are not evaluated by IUCN. The main problems are: (i) fraud in the allocation of licenses, or under-reporting catches (Nguyen-Van-Chi-Bonnardel, 1969; Goffinet, 1992; Kaczynski and Fluharty, 2002; Belhabib et al., 2014) and grants of fishing licenses for national and foreign vessels (World Bank, 1991), which resulted in change of

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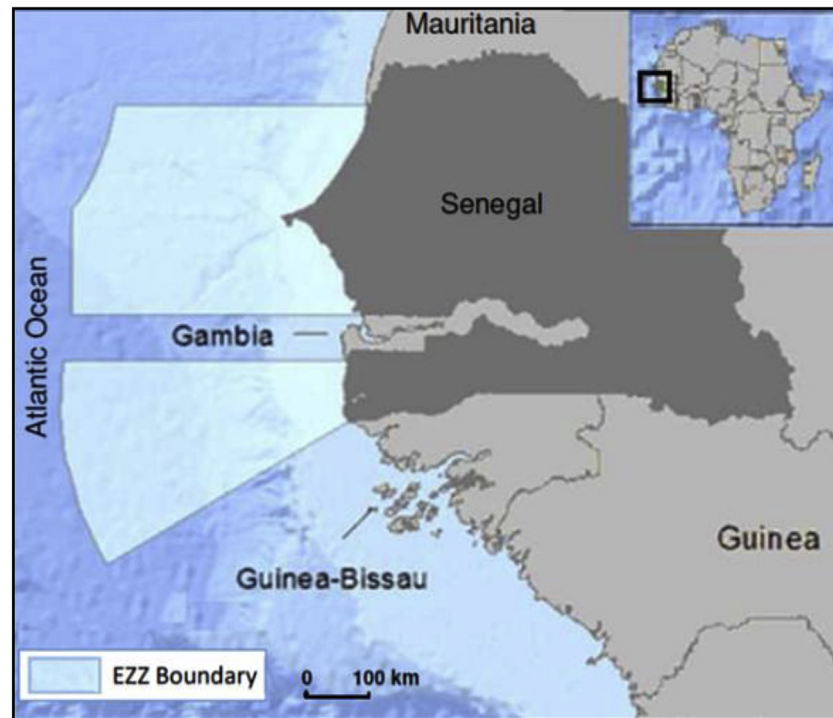


Fig. 1. Senegal showing in darker grey and its exclusive economic zone boundary, and its neighbour countries showing in light grey.

behaviors such as use of illegal fishing gear, risk of famine and job losses (Belhabib et al., 2014; Doumbouya et al., 2017); (ii) increase of the fishing effort to compete for the resource which generated conflicts between artisanal and industrial fishers (e.g. Russian and Eastern European industrial vessels) (Belhabib et al., 2015); (iii) destruction of rocky bottom areas that are breeding grounds for many species by some artisanal fishermen with dynamite explosives (Dème and Dioh, 1994; Diallo, 1995; Binet et al., 2012); (iv) lack of fishers' full participation in the decision-making process; (v) illegal fishing and incursion of foreign fishing vessels in the Exclusive Economic Zone (EEZ) and artisanal fishing areas (Doumbouya et al., 2017).

It is necessary to systematically analyze the fisheries policies in fisheries which the marine resources abundance was declining. Some important studies have been conducted on the fisheries management and governance in Senegal (Lenselink, 2002; UNEP, 2004; World Bank, 2012; Belhabib et al., 2017a). The issue of overcapacity, lack of control and illegal fishing, related to a growth extraction of fishery resources, mainly after a decline in exports contributions for groundnut and phosphate of the Senegalese national economy in the 1970s. This paper seeks to respond to a gap in the literature on how the implementation of a range of national policies influences effective protection of fishery resources.

Focusing on fisheries management policies in Senegal and its problems, we discuss (1) what policies were issued during different Senegalese political regimes, (2) how the policies were applied in practice, (3) how these policies changed fishers' behaviors, (4) why these policies affect fishers' income, and (5) what are the implications of various policies on fishery resources.

2. Policies issued from 1960 to 1976

Fisheries policies in Senegal were characterized by a set of regulations aimed at protecting coastal and marine resources, and maintaining fishing opportunities for the small-scale and large-scale domestic sectors (Spalding et al., 2015). The regulations were focused on the fishing zones, fishing gear modification, monitoring control, and

surveillance (sanctioning), authorizations to fish, size of fish.

At the beginning of the 1960s, the objective of these policies aimed at developing the small-scale sector and increasing production, this had to pass by motorization, fuel subsidies. There were around 5518 pirogues in 1964 of which 1824 were equipped with motors. Moreover, there was an unprecedented landing due to increased commercialization of fresh fish, and technological effects induced by the construction of large pirogues capable of carrying large catches (more than 20 tonnes). Their introduction was gradual and was as a result of lack of access to the resources within adjacent waters (Belhabib et al., 2017b). However, the fisheries policies have changed fishers' behavior with the introduction of new technologies (e.g. motorization), and artisanal boats and new fishing gear (purse-seine). For example, these innovations have allowed an increase in vessels sizes (e.g. 28, 32 and 54 m), fishing power (e.g. 600–2500 Kilowatts), gross registered tonnage (e.g. 235–258) and fuel (e.g. 500–700 L), time of activity and extension of fishing areas. Then, from 1960 to 1976, catches were relatively high from 258,310 tonnes to 476,050 tonnes respectively for artisanal fisheries (Fig. 2), due to the increase in small-scale pirogue fishing capacity (Belhabib et al., 2014). Moreover, industrial fisheries catch represented 89,670 tonnes in 1960 to a high increase of 574,110 tonnes in 1976 (Fig. 2), due to also fishing capacity in the water of Senegal jurisdiction. There were policies aimed at consolidating cooperative movement, improving artisanal processing, and developing marketing. These policies had a positive effect on the increase of fishermen's income by 2.4 fold (from 171 to 582 \$/Year). Therefore, after the drought event of the 1970s, however, fisheries played a major role in Senegal national economic performance after the decrease of supply production of peanut and phosphate (Ganapathiraju and Pitcher, 2006). The total value (US\$) of the fishing sector in the waters of Senegal increased from \$210.08 million US in 1960 to \$440.14 million US in 1976 for artisanal fisheries and from \$63.56 million US in 1960 to \$527.32 million US in 1976 for industrial fisheries (Fig. 3). Although the supply of seafood increased in this period, the demand for fresh fish in the domestic market was much greater than the supply, and ex-vessel prices grew continuously.

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