

Public policies to support artisanal fishing in Senegal: between inconsistency and perverse effects

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Highlights

- The evolution of retail prices of the most consumed demersal and pelagic fish species in Senegal is analysed for the period 1980 - 2016.
- The fall in per capita consumption is studied in a context of significant growth in exports over the same period.
- Public policies to support artisanal fisheries for nutritional security are reviewed and questioned.
- Reflections and policy proposals are presented for the supply of fish to the market at prices accessible to populations with low purchasing power.

Abstract

The objective of the paper is to present an analysis of the existing tensions between the national and external markets for fishery products and the relevance of public policies to support artisanal fisheries in Senegal. The method consisted of analyzing national data on production, local supply, foreign trade and the evolution of retail fish prices on the local market. Overall, the analysis shows the increasing difficulty of obtaining higher quality fish at a price that corresponds to the purchasing power of the Senegalese: the export market absorbs most of the fish with high commercial value and impeccable quality, while the domestic market has to make do with species that are not highly prized abroad and with downgraded fish that are not suitable for export. Thus, Senegalese artisanal fishing supplies the foreign market more than it supplies the local market. This situation renders illusory the contribution of fishing to the food security of the Senegalese people, which is so highly praised in the strategic documents of public fisheries policies. In addition, this situation creates tensions around the resources and markets. These tensions will be even more important in the decades to come with the situation of overexploitation of fisheries resources and climate change, but also the significant population growth of developing countries. The expected demographic growth will mechanically increase the national demand for fishery products. The implementation of a production domestication policy, the revision of policies to support artisanal fishing, as well as regulation of the selling price per kilogram according to the species, are necessary to reach at least the world

consumption average of 20kg/pers/year and to make fishing a determining sector for the nutritional security of Senegalese.

Keywords: Senegal - Food security - Public policies - Fish - Prices

1. Introduction

The Senegalese fisheries sector has benefited greatly from state support through various public policies. These include support for the process of motorization of the pirogue park, fuel equalisation, tax exemption for fisheries products, free access to resources for artisanal fisheries, and even export subsidies (Brochier et al., 2018; Dème et al., 2019; Dème, 2018; Bâ et al., 2016). By supporting artisanal fishermen, the intention by authorities was to improve the nutritional situation of Senegalese people by supplying the local market with seafood products at prices compatible with the population's purchasing power (Dème et al., 2021c; Senegal, 2019; Senegal, 2017; Senegal, 2015). However, in the absence of supervision and evaluation of this support for fishing, the public policies implemented have produced perverse effects. Indeed, they have favoured the growing connection of the fisheries sector to exports and market play without real state control (Failler et al., 2020; Dème, 2018; Failler et al., 2004). As a result, exports have expanded rapidly over the last twenty years. The volume of fishery products exported over the period 2008 - 2018 averaged 170,000 tons per year and represented almost 38% of the total average annual production estimated at 450,000 tons. Over the same period, imports averaged less than 13900 tons per year (Dème et al., 2021c) Over the years, this growth in exports and the low level of imports have created the conditions for a decrease in supply on the domestic market. Thus, demand is greater than supply (Dème et al., 2021c). This situation has led to an increase in the selling price per kilogram of the fish types most consumed in Senegal, particularly pelagic, demersal and artisanal products (Berchie et al., 2021; Belhabib, 2015; Niass et al., 2011; Gascuel, 2009; Charles Dominique, 2008). With the rate of exports and soaring prices, fish and processed products are becoming more and more difficult to access for the Senegalese population. It is urgent for the Senegalese government to put in place large-scale policies to redress the curve and supply the local market in sufficient quantities (Dème et al., 2021c; Béné et al., 2015; Binet et al., 2012; Béné et al., 2008).

The aim of the article is to highlight the mechanisms that contribute to the fall in supply of the local market for fisheries products in Senegal and to the rise in prices, in addition to presenting a critical reflection on public policies to support artisanal fishing. The work on policies to support artisanal fisheries has mainly focused on the microeconomic (increase in the profit of fisheries actors with an improvement in operating accounts) and macroeconomic benefits (incentive to invest, growth in catching capacity, and mitigation of the trade balance deficit) (Drakeford et al., 2020; Greenpeace, 2019; Sy et al., 2019; Badjeck et al., 2010; Failler et al., 2004). The present work differs from these works and provides a new reading by evaluating the repercussion of public support for artisanal fisheries on the availability in quantity and quality of resources and their accessibility to Senegalese consumers with low purchasing power. In doing so, this work contributes to the consistency of objectives and support policies for small-scale fishing in a context where their production is intended more for the external market than

for the internal market. In addition, this piece points to the lack of measures to regulate markets and provide a framework for the supply of artisanal production.

The method consisted of setting up a first database over a ten-year period (2009 – 2018), integrating national production of fishery products, trade (export and import) in live weight and demographics in order to monitor the evolution of the marketing of products and national consumption. A second database was used to compile average annual sales prices for demersal species (white grouper, captain and octopus) and small pelagic species (flat and round sardinella, ethmalose), the most commonly consumed species in Senegal, over a period of thirty-six years (1980 - 2016) in order to assess their evolution. All of this data was compiled from several sources, including CRODT statistical bulletins, annual reports from the Directorate of Maritime Fisheries (DPM) and the Directorate of Fisheries Processing Industries (DITP). In addition to this collated data, an inventory of strategic documents was undertaken to determine the contribution of fishing to the national nutritional security system. In parallel, this inventory work was also carried out on the public policies supporting small-scale fishing in order to characterise them in the first instance, and then to carry out a critical analysis.

The article is structured in three parts. The first part characterises the marketing of fishery products over the decade 2009 - 2018, with exports dominating domestic market supply. The second part deals with the evolution of fish selling prices, pointing out the continuous increase of the most consumed species in Senegal. Finally, the third part, in the form of a discussion, characterises public policies before coming to a critical analysis of the relevancy of this financing in a context of extraversion of the fisheries sector, ending with recommendations for public policies. It concludes with the imperative need for a reformulation of public policies in support of fisheries to adapt to the context.

2. A transfer of proteins from Senegal to the countries of the sub-region, Asia and Europe: consequences of the decline in the consumption of fish products

Fish consumption is on a downward trend in developed countries (Chin Yee et al., 2019; Obiero et al., 2019). For northern countries, this drop-in consumption is as a result of significant demographic growth with an increase in demand, or through the development of substitute products that have led to a lack of interest in seafood (Failler, 2020; Failler, 2014; Gascuel, 2009). In Senegal, the drop-in consumption is not influenced by population growth, and fish is of particular interest to consumers (75% of animal protein requirements) (Failler, 2020; Djissou et al., 2016; Ndiaye et al., 2015). The only mechanism reducing consumption remains the large quantities of fish exported in recent years (Failler, 2020; Failler et al., 2014). From 2008 to 2018, the export curve has been steadily increasing while the apparent availability curve has been steadily decreasing (Figure 1). Relatively low fish imports have not been able to close this gap. The trade balance for fishery products is largely in surplus in Senegal, with exports thirteen times greater than imports (*Figure 1*).

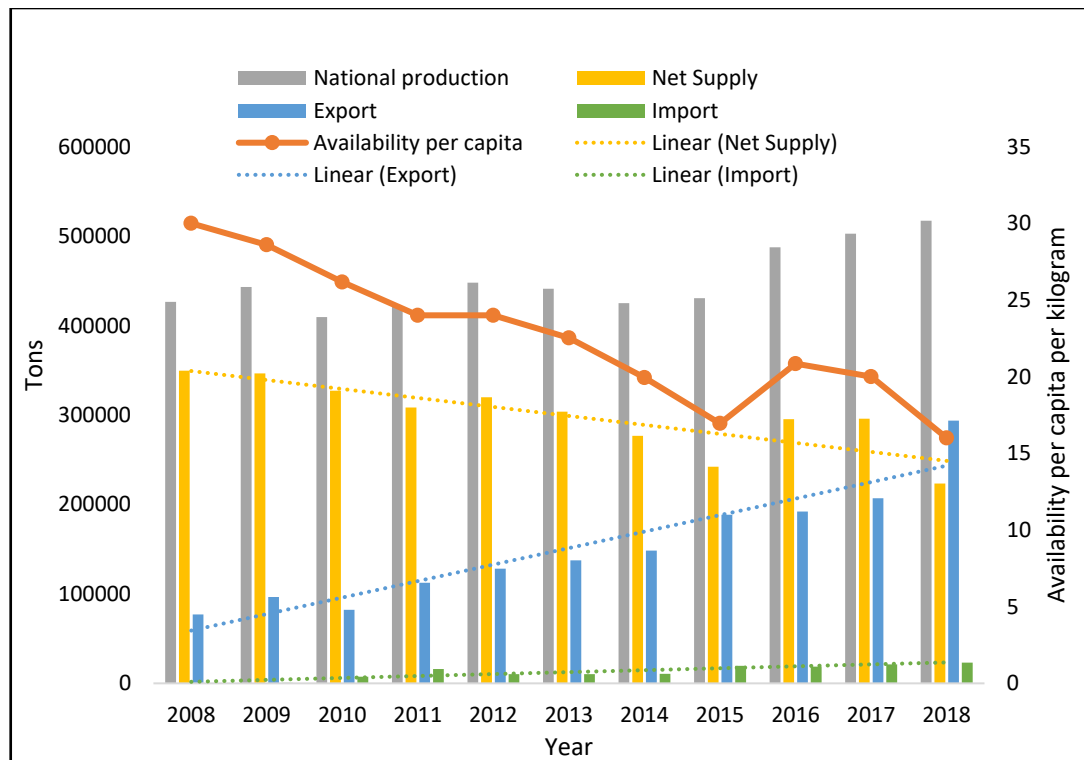


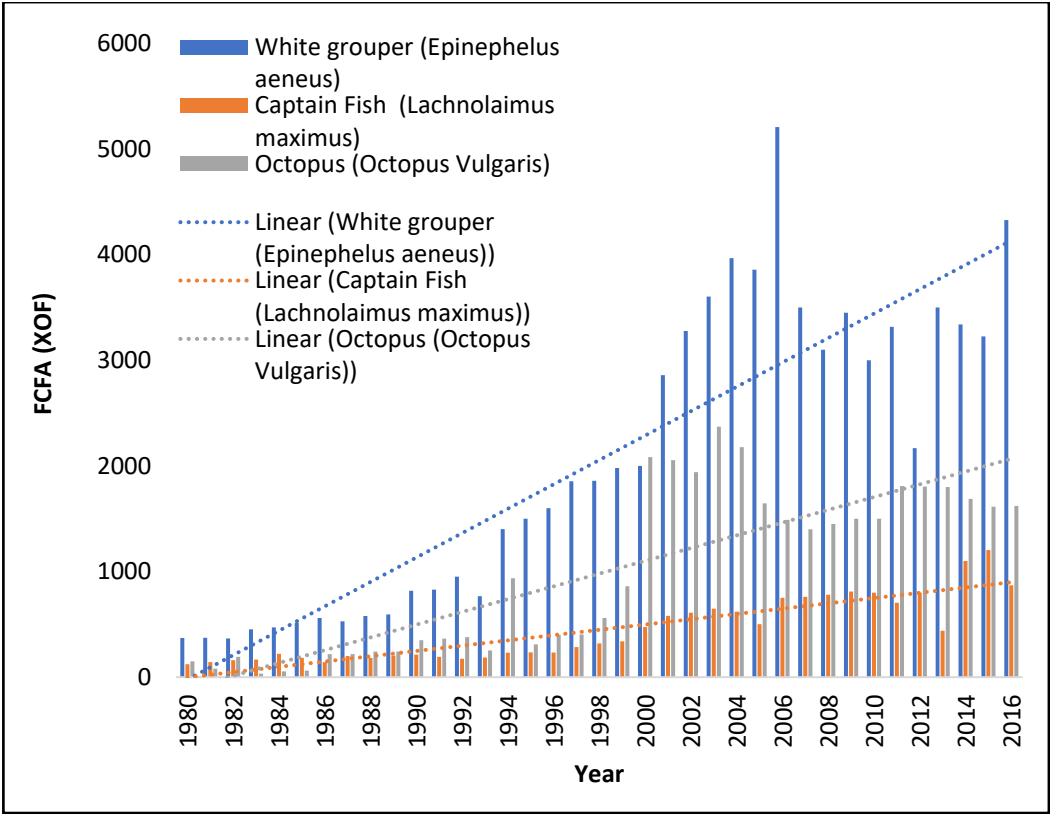
Figure 1: National data on production, foreign, trade and consumption of fishery products in Senegal

The attraction of external demand, boosted by the effect of globalisation, has strongly determined the evolution of the Senegalese fisheries sector (Gascuel, 2009). Since 2008, the net supply has dropped considerably, resulting in a drop in individual fish consumption (30 kg/persons/year in 2008 compared to 16 kg in 2018) (Figure 1). Thus, in Senegal the growth in production benefits exports more than the supply of the national market. In addition to this drop in per capita consumption, the scarcity of fish on the market has led to an increase in the price per kilogram of the most commonly consumed species in Senegal, which will be described in the following section.

3. Increasingly difficult to access resources: soaring prices per kilogram of the most consumed species in Senegal

Faced with a solvent external market at attractive prices, fishing sectors such as artisanal fishing, which had previously been geared towards supplying the domestic market, have now sought to export with more intensity their products, in particular small pelagics (Ziegler et al., 2011). Thus, as shown in Figure 1, a decrease in supply on the domestic market has been realised, causing a considerable increase in prices as poverty levels rise domestically in Senegal (Gascuel, 2009). Taking the most widely consumed species in Senegal as a reference, there has been a rapid and continuous evolution in selling prices per kilogram (Figure 1). Thus, over forty years, the price of white grouper has increased sixfold, from an average of 650 FCFA (XOF) over the period 1980 - 2000 to an average of 3,600 FCFA per kilogram over the period 2000 – 2016 (Figure 2). The same is true of other demersal species that are the most traded on the local market, Captain Fish (*Lachnolaimus maximus*) and Octopus (*Octopus Vulgaris*). In 1990, these

two species were sold at less than 150 FCFA (XOF) per kilogram, and over the decade 2010 - 2020, the price of the captain has been multiplied by six (i.e. an average of 750 FCFA (XOF) per kilogram), while the price of the octopus has multiplied by 14 (i.e. an average of 1,720 FCFA (XOF)) (Figure 2).

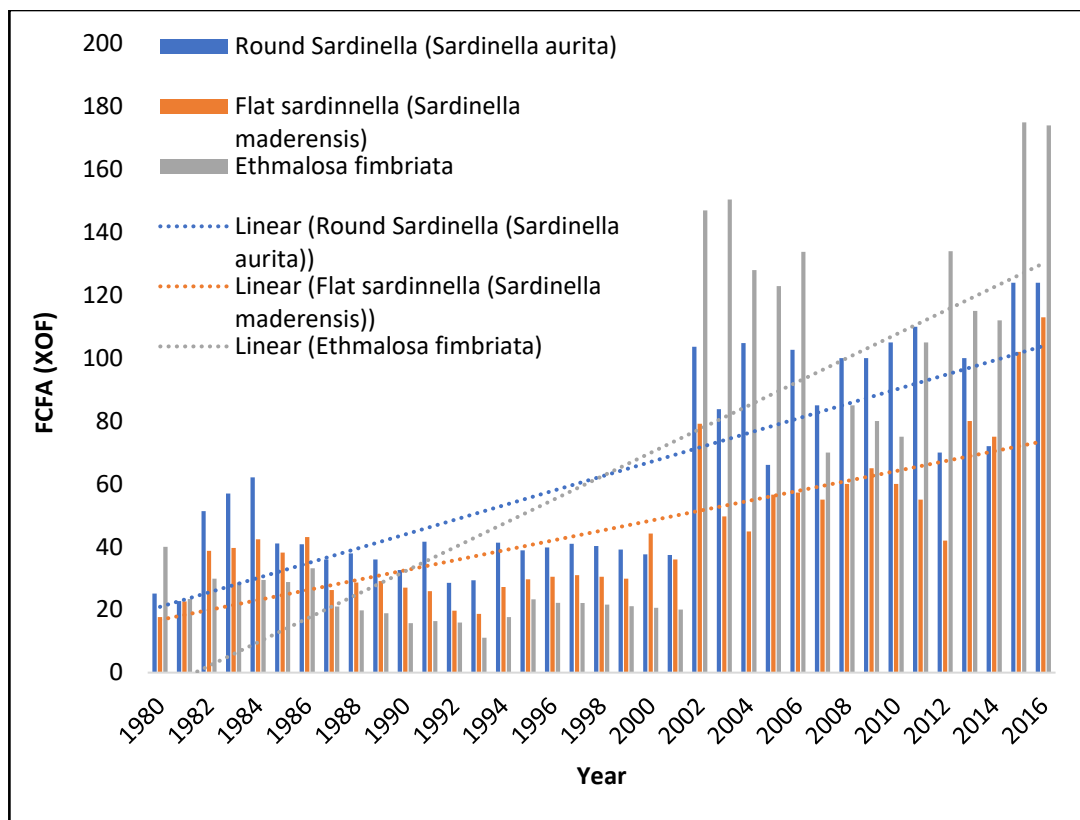


Source: Data compiled from the reports of the DPM and CRODT

Figure 2 : Evolution of the selling prices of the most consumed demersal in Senegal from 1980 to 2006 per kilogram (Data compiled from the reports of the DPM and CRODT)¹

The surge in fish prices is even more illustrative in the case of small pelagics, which represent more than 75% of consumption and which were previously accessible to populations with low purchasing power. Figure 3 shows an average price of 25 FCFA (XOF) per kilogram over the period 1980 to 2000 for flat and round sardinella and ethmalose. Since then, the average price per kilogram of the three species has been over 150 FCFA (XOF) (Figure 3).

¹ Given the significant fluctuation in species prices according to the seasonality of production activity and landings, the prices of the various species per year were obtained by averaging the monthly prices for each species from the DPM data.



Source: Data compiled from CRODT and DPM reports

Figure 3 : Evolution of the selling prices of the most consumed small pelagics in Senegal from 1980 to 2016 per kilogram (Data compiled from CRODT and DPM reports)

Overall, there is pressure on prices with the decline in per capita fish consumption noted above, largely as a result of the reduction in domestic supply and to a lesser extent the scarcity of products (Gascuel, 2009). Thus, the rise in prices is attributable to the growth in exports to Senegal, with the result that Senegalese demand for fish products exceeds supply and responds to market logic (Gascuel, 2009). When compared with the country's precarious situation, where 50.8% are below the poverty line and live on less than 1,000 FCFA (XOF) per day, it can be deduced that demersal species are virtually inaccessible to more than 50% of the Senegalese population (ANSD, 2016; Sy, 2014; Camara, 2002). Furthermore, the prices of small pelagics, which constitute the 'food safety net' for the majority of consumers, are subject to tension given their multi-use nature, which is currently being noted (development of the export market and establishment of fishmeal factories in Senegal) (Camara, 2002). These tensions on the prices of demersal and pelagic fish will be exacerbated in the future without the implementation of real market regulation policies.

The following section will show that public policies to support small-scale fishing have no real impact on the quantities available and the selling prices of fish, which calls into question their social nature and relevance. This situation raises a crucial question: who ultimately benefits from state support for small-scale fishing?

4. Discussion: public fisheries policies and the issue of food security

Fish is an important source of animal protein for the Senegalese population (Dème et al., 2021c). Due to the decline of agriculture and livestock farming, which were the traditional providers of animal and vegetable proteins, fishing has become an essential component of the State's food security policy (Berchie et al., 2021; Belhabib et al., 2015). This contribution to national nutritional security is all the more decisive as it validates the fact that all the strategic orientation documents for fisheries are in line with the priority of satisfying the national demand for fishery products (**Table 1**).

Table 1 : Strategic policy and documents for fisheries and national food security objectives

Public fisheries policies in Senegal: the reference documents	Period covered by the document	Expected fishing objectives
Emerging Senegal Plan - PSE²	2014 - 2035	« the PSE, the current strategic framework of Senegal's macroeconomic policy, assigns the fishing sector (...) a central role in strengthening food security (...) ». (Sénégal, 2014, p.320)
Fisheries and aquaculture sector policy letter³	2016 - 2023	The major objective of the sectoral policy letter is to make fisheries "a sustainable engine of growth and social inclusion while ensuring the food of the population" (Dème, 2018, p.122)
National Strategic Review for the Total Eradication of Hunger – SDG 2 in Senegal	2017	"The fishing sector contributes substantially to the food security of the population" (Senegal, 2017, p.74)
National Food Security and Resilience Strategy - SNSAR	2015 - 2035	"Senegalese artisanal fishing is expected to achieve a lasting improvement in the availability of diversified, healthy and nutritious products (...)" (Sénégal, 2015, p.51).

This predominant place of fishing in the orientation documents of national public policies justifies the important investments injected in the fisheries sector by the State and the particular support granted to artisanal fishing in order to satisfy the strong demand for fisheries products and to escape from nutritional precariousness (Sall et al., 2021). This support was provided through fuel equalisation, tax exemption for fishery products, subsidies for outboard motors and free access to fishery resources for artisanal fishing (Dème et al., 2021a; Dème et al., 2021b; Bâ et al., 2016) (**Figure 4**).

² After the implementation of two Poverty Reduction Strategy Papers (PRSP I and II), the Senegalese government opted for the implementation of a new strategic document called the Emerging Senegalese Plan (PSE), which constitutes the frame of reference for the country's short and long term economic and social policy.

³ The sectoral policy letter is a reference document elaborated by the Ministry of Fisheries and Maritime Economy - MPEM involving all the actors of the fisheries sector through national consultations. Ultimately, it provides information on the strategy to be followed for the development of the sector and the priorities for local and national interventions.

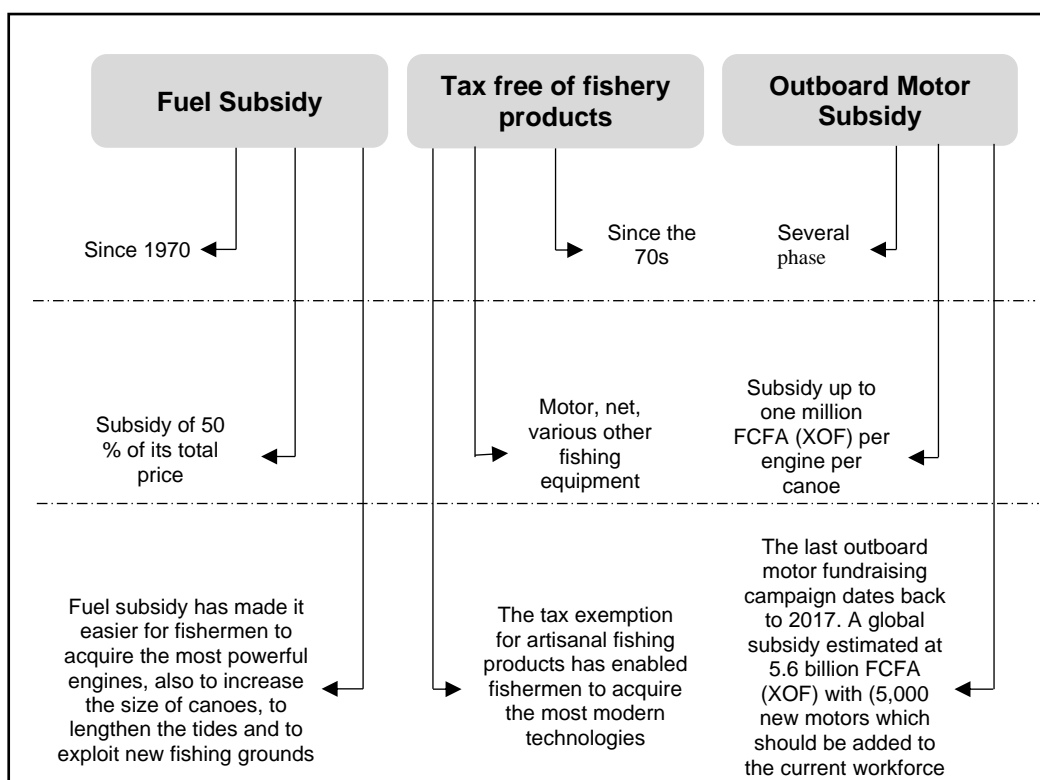


Figure 4 : Summary of key public policies in support of artisanal fishing by the State of Senegal

By supporting the artisanal fisheries sector in particular, Senegalese public policies are pursuing a major objective, which is to improve the situation of the Senegalese people by supplying the national market correctly at prices that are in line with the population's purchasing power. However, in a context of significant development of foreign trade in fish, with annual quantities exported exceeding the supply of the local market (Figure 1), the coherence of this support may be questioned. Indeed, such export quantities highlight inconsistencies in public fisheries policies, since the socio-political objective of ensuring the nutritional security of Senegalese populations through fishing seems to be in contradiction with the objective of economic remuneration through Senegal's trade in exports of marine products. The orientation of the majority of artisanal fisheries production towards external markets raises the question of who ultimately benefits from the support allocated by public policies to the artisanal sector. In light of the statistics on exports shown in Figure 1, it seems that artisanal fishing has turned away from its initial objective of supplying the domestic market in sufficient quantities, with the support provided by the state instead benefitting exportation and the foreign consumer. This is further realised in the fact that the local market is increasingly reduced in its supply whilst suffering with progressively higher prices (Failler, 2020, Failler, 2014, Sowman, 2014). This state of affairs confirms the words of Didier Gascuel, 'we fish in the South, we eat in the North' (2009), with a very significant drop in consumption for the poorest sections of the population (Mankor, 2009). Ultimately, the Senegalese government's support for small-scale fishing does not benefit local consumers and therefore poses a serious problem of coherence in public policy

and injustice, due to the fact that the Senegalese population rely on seafood products more than ever for animal protein intake (75%) (Mankor, 2009). This situation leads to the urgent need to analyse public fisheries policies and the tensions on the domestic market.

The study therefore recommends that support for small-scale fishing be reviewed in order to benefit the Senegalese consumer, firstly through the availability of the resource, and secondly through accessible prices. To this end, the possibilities of implementing a selective policy on fuel subsidies should be explored. Thus, the units whose catches are directed towards the local market (fish trade and artisanal processing) could be the only ones to benefit from the equalization on the fuel-pirogue. This will encourage fishermen and fishmongers in the artisanal sector to favour the local market rather than the external market (Allison et al., 2009). It will also allow less emphasis to be placed on the economic and private benefit (import-export companies, fishmongers and the external market) of support for artisanal fisheries, but to ensure that state support for artisanal fisheries results in a social benefit that can be enjoyed by all consumers (Failler et al., 2020). The case of Guinea shows that in the absence of an export market to European and Asian countries, domestic prices generally remain very low (Failler, 2009; Binet et al., 2012). Now, beyond the issue of state support in a context of market tension, fundamental work must be undertaken by public decision-makers in the fisheries sector in order to define a policy for the net supply of fisheries products by ensuring that the quantities of fish exported are on a par with the fishing agreements based on the principle of surplus (Giulia et al., 2011). In other words, exports should be a mechanism to dispose of the surplus not needed for the Senegalese population.

The application of these recommendations will make it possible in the short term to exceed the FAO's annual average of 20kg per person in terms of fish consumption, which are crucial to the protein aspect of Senegalese diets. These recommendations will also lead to a less influential external market, which will decrease selling prices per kilogram. Finally, public policy support will have a national impact by allowing local consumers to benefit from access to a quantity and quality of fish in line with the purchasing power of the Senegalese.

5. Conclusion

The uncontrolled development of Senegal's foreign trade in seafood products is regularly presented as a development factor due to its significant contribution to the country's trade balance. However, it appears to be more of an obstacle in light of the consequences it has on the availability of fisheries resources and the continuous rise in prices per kilogram for all species combined. Moreover, this foreign trade seriously calls into question the social objective of public policies to support the artisanal sector, which were previously justified by an abundant supply of the local market. Thus, this support generates an economic benefit for trading companies (import-export), fishermen / fishmongers, and the foreign market, with increasing difficulties for the Senegalese consumer to access quality fish at a price in line with their low purchasing power. Since they have not been able to access the "noble" demersal fish that end up on the plates of the countries of the North for years now, the only alternative for the average Senegalese consumer has been to fall back on small pelagic species with low commercial value. In recent years, however, these small pelagic species, which used to account for less than 10% of the tonnage of exported products, now represent 60% of the volume exported, and are

therefore less available on the local market. These small pelagic fish end up being transformed into fishmeal, which is used as feed for catfish farms in Asian countries, or for chicken farms in Northern countries. All of this raises the issue of incoherence of public policies to support small-scale fishing, which ultimately benefits everyone except the local consumer. This raises severe consequences in the nutritional security of Senegalese people in the decades to come if nothing is done.

The article concludes by raising the urgent need to reorient support policies for artisanal fisheries and to readjust the marketing of fisheries production. This would involve the implementation of support policies accessible only to fishermen supplying the local market to make it more attractive. Stronger measures could also be considered by exporting only the surplus production after satisfying the local market by defining the external market quota annually. Ultimately, it is expected that the social benefits of policy support for the artisanal fisheries sector will take precedence over the economic benefits.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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