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Policy brief

Estimating the impact of irregular and unsustainable fishing of distant-water fishing fleets in Senegal

Miren Gutierrez and Alberto Lemma
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Abstract

This policy brief provides an overview of the composition and practices of Senegal's fishing fleet and the foreign fleet operating in Senegal's Exclusive Economic Zone (EEZ), with a focus on the prevalence of trawlers and the significant presence of foreign vessels, particularly from China and Spain. It also discusses the ownership of the fleet, controversies surrounding unsustainable practices, and the implications for marine biodiversity and local communities.

Acknowledgements

Introduction

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The brief synthesises information from the report Fishy Business: estimating the impact of irregular and unsustainable fishing of distant-water fishing fleets in Ecuador, Ghana, Peru, the Philippines and Senegal (Gutierrez et al., 2024).

Geographical and biological context of Senegal

Located in West Africa, Senegal spans an area of 196,722 km², situated between 12° and 17° north latitude and between 11° and 18° west longitude. Its coastline stretches 718 km along the Atlantic Ocean, with a continental shelf measuring over 23,800 km² and an Exclusive Economic Zone (EEZ) that extends 200 nautical miles and covers 180,895 km². This geographical position provides the entire western part of the country with a rich fishing ground that is integral to its economy and food security (CSAP, 2016). The Senegalese coast is also characterised by estuarine areas formed by the Senegal, Sine Saloum and Casamance rivers. The country's geographical location is combined with favourable meteorological conditions for high biological productivity in the country's marine waters, where there is a seasonal upwelling phenomenon.

The main fishery products include small pelagic species, demersal fish, and cephalopods, with small pelagic fishes like sardinella being particularly important, making up about 64% of annual catches (Ba et al., 2016). However, the fisheries face challenges such as overfishing, illegal, unreported, and unregulated (IUU) fishing, and climate change impacts, which have led to depleted fish stocks and necessitate sustainable management practices (Ba et al., 2016).

Fleet composition and types of vessels

We have built a relational database, drawn from expertise in fisheries, specialised literature, and the FishSpektrum Krakken® V15.0 high-granularity data registry. Krakken® V15.0 is the largest registry of fishing vessels, owned by the Seattle-based Allen Institute for AI (a non-profit research institute founded by Microsoft co-founder Paul Allen). Our analysis shows that the Senegalese fishing fleet is dominated by trawlers, which account for 64.26% of the vessels.

Shrimpers represent 9.94%, while a significant portion (19.39%) were initially unclassified but are mostly trawlers upon further analysis. The foreign fleet operating in Senegal's EEZ consists mainly of trawlers (49.13%), longliners (17.77%), and seiners (14.63%). The most common flags for these foreign vessels are China (32.06%), Spain (16.72%), and Belize (5.92%), with the latter two being flags of convenience (FoCs).

Ownership, concerns, and other issues

The study shows that the Senegalese domestic fleet has notable international ties, with 5.13% of the vessels owned by Chinese companies. In Senegal, a total of 117 domestic and foreign vessels are related to Chinese interests. For example, the main domestic vessel owner in Senegal is China National Overseas Fishery CORP (CNFC), with 26 trawlers (4.17% of the national fleet) and 16 foreign longliners (5.17% of the foreign fleet operating in this EEZ). CNFC owns the largest Chinese DWF fleet in the world, with at least 257 vessels (Gutierrez et al., 2020). Of the CNFC DWF vessels, in 2020, 192 were flagged to China, with the rest flagged to Senegal (31), Mozambique (12), Mauritania (9), unknown (7), and Belize (2), among others (ibid.). CNFC is coined one of the 'top 10 companies owning vessels accused of forced labour' (Daniels et al., 2022: 27). CNFC, among other Chinese DWF companies, has been accused of under-declaring their fishing vessels' gross tonnage (GT) in Senegal, Guinea Bissau, and Guinea (Greenpeace, 2015).

Economic importance of fishing in Senegal

The fisheries sector in Senegal is a traditional and vital component of the national economy, contributing approximately 3.2% to the GDP and employing around 600,000 people, which is about 15% of the labour force (CSAP, 2016). The sector is characterised by a mix of artisanal, semi-industrial, and industrial fishing practices, with artisanal fishing accounting for 90% of the landings. With an annual catch rate of 450,000 metric tons (MT) per year, for the last five years, Senegal has been the second-largest fish producer in West Africa, behind Nigeria (530,000 MT) and closely followed by Ghana (344,000 MT). As a significant pillar of Senegal's economic and social development, the fisheries sector accounted for 10.2% of Senegal's exports in 2021. It is the leading export branch with over 250 billion CFA francs (XOF) in 2021 (Bousso, 2022).

In 2021, Senegal's total marine fisheries landings reached 462,002 tons, valued at XOF 227 billion. This represented a decline over the previous two years. Artisanal fisheries, which account for at least three-quarters of total fish production, generated XOF 139 billion in 2021, corresponding to 61% of the total. Artisanal fisheries consistently make up most of Senegal's catch (ibid.).

Exports and price dynamics

Senegal saw a significant increase in total fish exports from 2016 to 2021. The volume of fish exports increased by 46%, from 221,263 tons in 2016 to 322,283 tons in 2021 – though the highest volume of exports was recorded in 2020, at 352,856 tons. The value of these exports also saw a substantial increase of 52% during the same period (GLOBEFISH, 2023).

The approximate retail price of tuna ranges from $3.50 to $5.50 per kilogram, whereas the wholesale price is between $2.45 and $3.85 per kilogram. Meanwhile, mackerel has a retail price of $5.45 to $8.50 per kilogram, and the wholesale price ranges from $3.82 to $5.95 per kilogram (Selena Wamucii, 2023).

Impact estimation methodology

The methodology for estimating the economic impacts of firms involved in wrongdoing, irregularities, or unsustainable behaviour in the fisheries sector across the five case study countries – Ecuador, Peru, Ghana, Senegal, and the Philippines – represents a comprehensive approach to assessing the potential consequences of such activities. This multi-faceted evaluation, structured into three main chapters in the full report, delves into the specifics of tonnage conversion, payload calculation, price determination, and the consequent estimations of economic impact, GDP impacts, employment impacts, and poverty impacts.

1. **Tonnage conversion and payload calculation:** The methodology begins with a tonnage conversion formula to transition from gross tonnage (GT) to net tonnage (NT), reflecting the vessel's capacity utilised for fish storage. This step is critical for understanding the economic output and efficiency of the fishing sector. Payload, representing the quantity of fish carried, is calculated using the formula:
   Payload = NT−(NT×60%)
   This calculation is pivotal for assessing the volume of fish caught and its potential economic contribution.
2. **Price determination and economic impact estimation:** The average price per fish species aids in determining the financial value of the catch. The economic impact attributable to the fishing activities of these firms is then estimated by multiplying the payload by the fish price and a constant factor, offering insights into the financial significance of the fishing industry within each country's economy.
3. **GDP impacts:** The GDP contribution per ton of fish caught is calculated by first determining the total GDP contribution of the fisheries sector and then dividing this by the total catch in tons. This method facilitates a comparison of the economic efficiency and productivity of the fisheries sector across different countries, highlighting the variance in economic impact due to the activities of the examined firms.

4. **Employment and poverty impacts:** The analysis extends to evaluating the employment impacts, presenting the number of direct and indirect workers per ton of caught fish, disaggregated by country. This approach provides a granular view of the workforce involved in fishing and related activities, shedding light on the sector's employment significance. Furthermore, the text explores the relationship between GDP growth and poverty reduction, employing the growth elasticity of poverty (GEP) to estimate potential impacts on poverty rates in the case study countries. This methodology offers a nuanced understanding of how economic changes within the fisheries sector can influence broader socio-economic conditions, including employment and poverty levels.

Impact on Senegal's GDP of firms with a history of wrongdoing, irregularities, or unsustainable behaviour in the fisheries sector

The analysis on the impact of fishing activities in Senegal, focusing on tuna and mackerel catches by domestic and foreign fleets, reveals significant economic, employment, and socio-economic implications for the country. By examining the operational details of seiners, longliners, and trawlers, the study sheds light on the scale of fishing operations and their contributions to Senegal's GDP, employment landscape, and potential effects on poverty levels.

The aggregated payloads and subsequent economic valuations of tuna and mackerel catches illustrate the substantial monetary contributions of these fishing activities to the Senegalese economy. The data indicates a stark contrast in catch volumes and values between domestic and foreign fleets, with mackerel representing a more considerable portion of the domestic catch and tuna dominating the foreign catch. This disparity underscores the varied focus and capacity of local versus international fishing operations, with domestic efforts significantly leaning towards mackerel and foreign fleets capturing larger quantities of tuna.

The total economic impact of these catches amounts to over $48 million. This represents 13.17% of the fisheries sector GDP, while at the national scale their impact is estimated at 0.2% of national GDP, broken down to 0.05% direct impacts through fishing operations and a more substantial indirect contribution of 0.186% through other segments of the fisheries value chain. The results highlight the critical role of fishing in Senegal's economy, particularly within the fisheries sector. The analysis provides a detailed breakdown of this impact, factoring in the prices per ton for each fish species and the resultant valuations for domestic and foreign catches. Such economic valuations serve not only to quantify the direct contributions of fishing to the national GDP but also to underscore the potential for growth and development within this sector.

Impact on Senegal's employment of firms with a history of wrongdoing, irregularities, or unsustainable behaviour in the fisheries sector

The fisheries sector plays a significant role in providing employment opportunities in Senegal. According to the latest government statistics, fisheries employed 97,444 people in 2019, of which it was estimated that 65% were employed directly (CSAP, 2016). In terms of the impact of IUU activities on employment, for every ton of catch by vessels owned or operated by companies with blacklisted vessels, previously involved in wrongdoing, or involved in diverse unsustainable practices, there is an impact of 0.21 jobs.

This breakdown includes an impact of 0.14 fishers and 0.07 jobs in other related roles within the fisheries value chain. Given the aggregate catch data, this job-potential effect equates to 2,503 positions. Specifically, the sector sees an impact of 1,668 fisher jobs and 834 jobs in other related roles. The analysis emphasises the importance of fishing to employment in Senegal. The sector not only provides livelihoods for a significant number of individuals but also supports a wider network of roles that contribute to the nation's socio-economic fabric.

Impact on poverty in Senegal of firms with a history of wrongdoing, irregularities, or unsustainable behaviour in the fisheries sector

Beyond economic contributions and employment, the research delves into the socio-economic implications of fishing activities, particularly regarding poverty. These operations have the potential to impact an additional 35,569 individuals living below the poverty line. This estimation suggests that while fishing contributes significantly to GDP and employment, its effects on poverty levels are complex and warrant careful consideration in policy and management decisions.

Conclusions

Senegal's fishing fleet is heavily influenced by foreign interests, mainly Chinese, and is characterised by a high number of trawlers. The presence of foreign vessels and the involvement of some companies in unsustainable practices raise concerns about the impact on marine biodiversity and the livelihoods of local communities. There is a need for more robust management and sustainability practices to address these issues.

The IUU fishing activities targeting tuna and mackerel in Senegal present a multifaceted challenge. The significant economic valuation of these catches underscores the sector's potential as a driver of national GDP and as a source of livelihood for thousands. However, the implications for poverty and the sustainability concerns associated with IUU fishing practices necessitate a balanced approach to fisheries management.

Recommendations for policymakers

Management and sustainability practices

- Implement stricter regulations and monitoring systems to ensure sustainable fishing practices and prevent overfishing.
- Encourage the use of selective gear to reduce bycatch.

Legal and ethical concerns

- Enforce labour laws to prevent forced labour and other human rights abuses on fishing vessels.
- Ensure accurate reporting of vessel gross tonnage to avoid evasion of regulations.

Community engagement

Involve local communities in decision-making processes related to fishing practices and policies to ensure their livelihoods are considered and protected.

Environmental protection

- Strengthen the enforcement of environmental regulations to protect marine biodiversity. Promote research on the impact of fishing on ecosystems and develop conservation strategies.

International cooperation

- Collaborate with international bodies and other countries to address issues related to FoC and to manage shared fish stocks effectively.
- Engage in regional agreements to combat illegal, unreported, and unregulated (IUU) fishing.

Enhance transparency and accountability

- Require detailed disclosure of ownership and operational practices for both domestic and foreign fleets operating in the Senegalese EEZ to prevent illegal activities and ensure accountability.
- Foster collaboration between the government, fishing industry, and non-governmental organisations to share best practices, data, and strategies for sustainable fishing.
- Implement a public reporting system for fishing activities, sanctions, and compliance with sustainability standards to increase transparency and accountability in the fishing industry.

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