Fisheries Resources −A Brief Introduction of the Republic of Senegal

Modou Mbengue*

Inspection of Sea Products, Dakar Central Fish Market, Ministry of Marine Economy, Transportation and Fishery, Dakar, Senegal

Abstract Fish is a major source of protein for the Senegalese population. Fishing plays a dominant role in the Government's policy towards generating employment. It currently generates about 100,000 direct jobs (fishermen) for nationals, of which more than 90% are in small-scale fishing. The fishing industry also contributes to Government revenue through different agreements. In addition to associated dues, fishing agreements imply a series of economic, trade and technical counterparts. Under the latest fishing agreement concluded by Senegal and the European Union (1997-2001), direct financial compensation amounts to about CFAF 32 billion. Despite its economic and social importance, the sector has to face serious disequilibria both in resource exploitation and market supply: the coastal demersal (deep lying fish) stocks with high market value (mostly exported) are fully and even over-exploited, with a serious risk of local market supply shortages looming ahead as the fishing effort shifts from locally consumed species to export-oriented ones.

Key words : Artisanal fisheries, industrial fisheries, Senegal

Introduction

Senegal is located in the western part of Africa with a land area of 196,722 km^2 (Fig. 1) and an estimated population of 10,072,000 people. Its coastline is approximately 718 km in extent and the EEZ covers an area of 192,000 km^2. Due to exceptional natural conditions, Senegal and its neighbours are endowed with some of the richest fishing grounds in the world. As a result, the marine fish resources off the coast of Senegal play a role in the culture, lives and economy of the population as large as any of the other natural resources in the country. Senegalese fishers have been involved in marine fisheries for centuries and coastal communities throughout the country have developed a culture of fishing. Fishing and associated activities such as processing, marketing, services and other part-time activities together are estimated to provide more than 600,000 jobs in Senegal (accounting for 17% of the labour force, and 10% of the rural population). In addition to livelihoods, the fisheries in Senegal make

Fig. Map of Senegal.

an extremely significant contribution to food security, constituting some 70% of animal protein consumption in the country, as estimated annual per capita fish con-

* Corresponding author
Phone: +221-77-64997-12
E-mail: modou67m@yahoo.fr

sumption is 26 kg (well above the world average of 16 kg). At the level of the country's economy, between 1997 and 2002 the fisheries sector accounted for about 2.3% of the country's GDP and 12.5% of the primary sector's GDP (i.e. approximately FCFA 300 billion or US$ 714 million in gross production value generating an added value of about FCFA 200 billion or US$ 476 million)[1]. Fish products also account for some 32% of the country's exports by volume, and roughly 37% of the total export value. In summary, marine fisheries play a critical role in the economy in Senegal, in terms of contribution to Gross Domestic Product (GDP), foreign exchange, food security and livelihoods.

Structure of fisheries resources

Fishing forms a vital sector of the Senegalese economy, particularly because, with oilseeds, fish is the most important export item, bringing valuable foreign exchange to the country. About 52,000 artisanal fishermen work in this sector with perhaps three times as many people engaged in fish processing and marketing in the informal part of the fish economy (there are 5,000 fishermen operating in the industrial sector). While the small-scale fishing sub sector accounts for more than 60% of the landings destined for export markets (and processed by specialized export companies), its share in total fish output exceeds 75% (Table 1). Almost 85% of artisanal fishermen operate in three areas; namely - the Grande Côte (comprising Kayar and Saint-Louis), the Petite Côte (comprising Mbour and Joal), and the Cap Vert (corresponding to the Dakar area) which are precisely those covered by our study. It is interesting to note that the capital stock of the small-scale fishing sector has increased rapidly during the last decade: thus, the number of pirogues operating in the different sites of artisanal fishing has increased by as much as 42% between 1994 and 1997. Although smaller than the average, the expansion of the artisanal fishing fleet in the most important ports remains quite impressive: 33% in the Cap Vert area, 31% in the Grande Côte, and 8% in the Petite Côte [2,3].Given such a rapid increase of the fishing capital stock, it is not surprising that there has been growing pressure on fish resources, particularly on bottom-dwelling species living in coastal waters which are considered to be overexploited [1].

As for coastal pelagic species, biologists of the Centre de Recherche Océanographique de Dakar-Thiaroye (CRODT) believe that they are rapidly nearing optimum exploitation. Witness to this rising pressure is the adaptive tendency of small-scale fishermen to adopt mixed gears and to go to more distant fishing sites (a strategy that has been made possible by the introduction of so-called .pirogues glacières., that is, pirogues equipped with ice boxes made of expanded polystyrene in which fish can be stocked and preserved for several consecutive days), but also the increasing incidence of conflicts between fishermen's groups using different harvesting techniques and the growing tensions between artisanal and industrial operators. Public authorities are increasingly aware of the threat on fish resources as evidenced by the fact that the notion of .biological rest has been recently introduced in the fishing agreement struck with the European Community for the period 1997-2001.

The fact of the matter is that the artisanal fishing sector has undergone rapid transformation during the last decades, particularly under the impact of significant technical innovations, including the shift from cotton to nylon nets, the motorization of traditional pirogues (and their adjustment to permit the fixing of an outboard engine), the introduction of large purse seines capable of collecting large schools of pelagic fishes, the fitting of ice boxes to the pirogues designed for hook-and-line fishing, etc. As a result, the productivity of boats and fishing gears in the small-scale sector has increased enormously, compounding the effect of their sheer multiplication on fish landings.

The total fish production, capture fishery production and aquaculture production of Senegal are shown in Figures 2, 3 & 4, respectively [4].

Trends in the operating accounts of small-scale fishing units

The following is a brief description of the kinds of fishing units used by small scale fisheries in Senegal.

Fishing units

Many small-scale fishing gear targets coastal demersals. Besides, due to the species scarcity problems, blend-fishing gear has replaced standard ones in each unit. Blend-fishing combines mainly three types of fishing: angling, dormant net and pot fishing (ADNP).

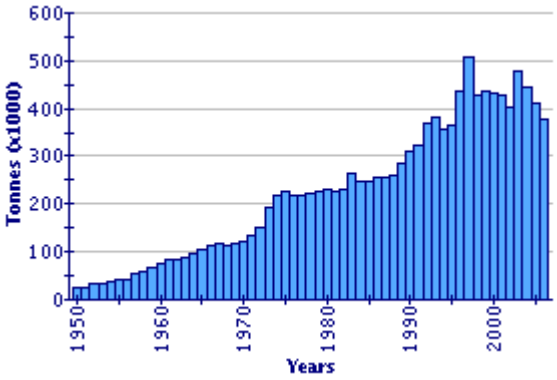

Fig. 2. Total fish production of Senegal (1950-2006).

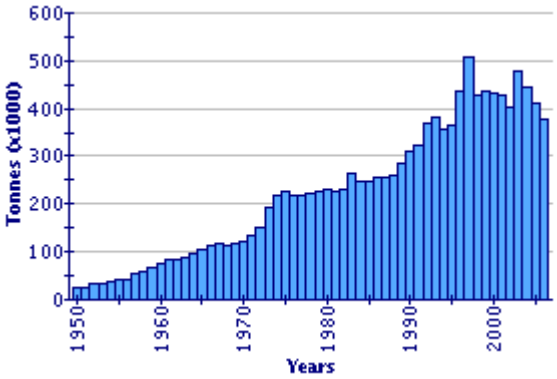

Fig. 3. Fish production from capture fishery (1950-2006).

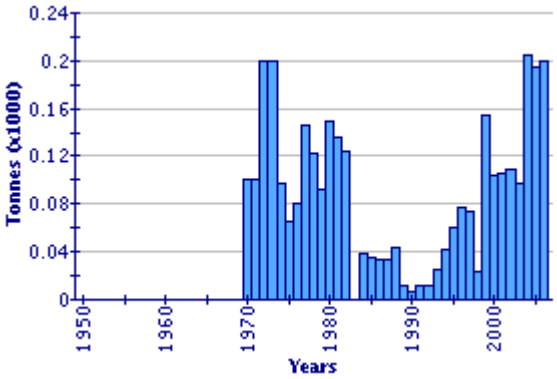

Fig. 4. Aquaculture production (1950-2006).

Purse seines

The FAO introduced purse seines in Senegal in 1972 in an effort to put at the disposal of small-scale fishermen, more efficient fishing gear to tap small coastal Pelagics [3].

Surrounding gill nets

Two types of nets are used depending on the hunted species. Big-stitch nets capture ethmaloses while the small-stitch net is more adapted to fishing flat sardinella. The ethmalose net is mainly used between June and October, a period when the hunted species is present in the fishing areas.

Icebox pirogue

The unit icebox pirogue can carry along several types of fishing lines at each tide: scad (*Decapterus sp, Trachurus sp*), wreck fish (*Epinephelus sp, Serranidae*) and sparidae (*Sparus caeruleostictus sp, Sparidae*) hand lines. The ground lines used for demersals fish from a anchored pirogue. Hook size depends on species size.

Trade

The main trade policies identified as contributing to the over-exploitation of resources are the following:

i) non-reciprocal advantages under the Lomé Agreements, authorizing Senegalese piscatorial products to enter the European market with the exemption of custom duties;

ii) an export subsidy of 15%, later raised to 25%, first applied to canned tuna and later extended to all piscatorial products;

iii) fishing agreements concluded with a number of foreign fleets.

Constraints

Despite the economic importance of Senegal's fishery resources and the marine ecosystems that support them, the sector has been facing major difficulties in recent years due to over fishing of the most valuable commercial resources and uncontrolled expansion of the number of fishers, boats and gear, as well as land-based fish processing and preservation facilities [5]. The sector has essentially faced the 'boom and bust' cycle common to many uncontrolled fisheries around the world, where rapid development and investment led to strong growth in catches and returns, as well as the number of fishers and fishing capacity. Then as the fisheries continued to grow in an uncontrolled environment beyond what the fish stocks and resource base could sustain, they started to contract, bringing down catch and growth rates.

Conclusions

Irrespective of the role played by external demand,

free access to resources implies that export-oriented fishing units were able to exploit the stocks of coastal demersal resources beyond its maximum sustainable yield. Small-scale fishing is much less specialized than industrial fishing, which increases the possibilities of rejections, should a quota system be introduced. The issue on the price of access to resources calls into question the fishing agreements concluded with foreign fleets, starting with those binding Senegal and the European Union. Many facilities for the acquisition of fishing units (reduced interest rates, reduced tax on motors and equipment, and subsidized pirogue fuel price) were instituted. While pelagic fishing units should always benefit from these measures in view of their deteriorating operating accounts and their contribution to the country's food security policy, maintaining them for coastal demersal fishing needs to be discussed. Concerning the new regulations, exports of endangered species as whole products might be banned or surtaxed. A freeze on global fishing (small-scale and industrial) effort on coastal demersals also seems to be desirable. As far as small-scale fishing units are concerned, licences might also be required.

Acknowledgement

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