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**Dynamic operation and resource development
fish in the Biosphere Reserve of the Saloum Delta
(RBDS)**

by

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Senegalese Institute
of
Agricultural Research

Studies and Documents

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and recovery

Fishery Resources

in Reserve

Delta Biosphere

Saloum (RBDS)

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Summary

The economy of the Biosphere Reserve of the Saloum Delta (RBDS) is highly dependent on the exploitation of renewable resources energies. Operating activities of marine resources are orchestrated by a schedule heavily dependent on climatic conditions. Calendar, which also influences the migration within the reserve and vis-à-vis the outside world. Configured to satisfy local consumption and the export of products to urban markets and foreign, operating systems were until recently relatively flexible. However, practices of production more intensive bio-mortgage today threaten the diversity of terrestrial and marine RBDS. Therefore, the reservation may no longer be considered a place of conservation, but rather as a place of exploitation of fisheries resources that offers little benefit to local producers because the tracks are mostly concentrated in the hands of outside operators.

Abstract

The economy of the Reserve of the Saloum Delta Biosphere (RBDS) strongly depends on the exploitation of the renewable resources. The activities of exploitation of marine resources are regulated by a timetable strongly dependent on climatic conditions. That calendar also influences the migratory movements within the reserve relative to outside. Configured to satisfy local consumption and the export of products to the urban or foreign markets, the production systems were until recently very flexible. However, more and more intensive practices of production of the mortgage and marine biodiversity of terrestrial and marine RBDS. Consequently, the RBDS can no longer be considered now as a place of nature conservation as a goal more natural resource production site offers very little benefit to local producers. The most of the commercial chains are dominated by foreign operators.

Introduction

The significance of market forces in the international work of marine activities is becoming increasingly visible in the Biosphere Reserve of the Saloum Delta (RBDS). The economy Market takes over the traditional systems of production and the fishing industry are mostly concentrated in the hands of outside operators, jeopardizing economic development, nomic and social RBDS.

The purpose of this article is to outline the characteristics of the former exploitation of fishery resources, its evolution and impacts societal and finally discuss the issue of governance the RBDS. More broadly, the study of the dynamics of ex-exploitation of renewable natural resources of the RBDS-s'ins described in a process of understanding the relationship that man has with a protected environment in West Africa.

Two main parts make up the article. The first part presents modes of exploitation of marine resources within the Reserve of the Saloum. Emphasis is placed on the seasonality of the operator tion, allowing to introduce the study of migration related to maritime activities. The second part deals with the process processing and marketing of fishery products.

The different sectors are identified and analyzed and the aspects gender equity and well-being of resident populations laid flat. A conclusion summarizes the main elements and places them in an optimal that of governance.

Exploitation of marine resources within the APCM

The exploitation of marine resources in the RBDS is a major economic activity. It includes various types of fisheries (pelagic, demersal and shrimp) and the collection of shellfish. Demersal resources are virtually exhausted (4000 tonnes in the year against only 80 700 tons born in 2000 (Dème et al., 2001), we note the increasing dominance important small pelagic (low value) in landings (80% of landings in 2002 (Dème, 2004) against 60% in 1988 (Bouso 1991)

Seasonality and organization of production activities

The value of knowledge work schedules is threefold. It first information on the organization of activities in time with one another, allowing then to highlight the ties that between them. It then documents the strategies of production units. It finally shows that the doors can be opened to the improvement of living conditions or the management of marine resources based on the notion of positive or negative interference.

Table 1 shows the schedules of major activities RBDS. Some activities are seasonal patterns or Annual, more or less marked. The main elements that condition-NEET seasonal activity are the availability of resources according to their life cycle (fruit, shrimp, shellfish, etc..) migration species (small pelagic fish, game) and rainfall that condition-NEET cultivation and harvesting (cultures, rice).

Concerning the organization of activities with one another and their relationship, the former exclusivity of farming during the rainy season is opposed diversity and multiple activities simultaneously the rest of the year. Activities food being clocked by the rains, the whole family unit is mobilized and used the elements residing outside the reserve. Fishermen Saloum enrolled during this period. These agricultural activities of the rainy season are the foundation of family underlying the organization of all family units in the RBDS (Sarr, 2002).

Fishing activities present the most diverse and are repaired, ties with the seasons (rainy season, dry season) and functional tion of the abundance of resources at certain times of the ann é e (Bonga or shrimp). Thus, if the rainy season is the season conducive to agricultural activities, it is expressed in terms of maritime more difficult sailing conditions and climatic conditions often Wind unsuitable for processing activities. There is therefore to intra-sectoral movement of workers between fishing and the activities agricultural ties. The first six months of the year (January-June) are constantly Cres fishing, while agriculture dominates the other six months. The exploitation of molluscs follows the same seasonal alternation and is strongly marked in Saloum. This reflects the fact that women, the main operators in the sector shellfish play a role very important in agricultural activities in the Saloum.

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The alternation of two main seasons (rainy season and season dry) regulates the exploitation of fishery resources in the Saloum (Figure 1). The rainy season (July-October), marked by a increase in temperature and precipitation, is the Season the shrimp. The dry season (November-June) characteristic of a lack of rainfall is the season the collection of shellfish and fish in Bonga. In season wet women, the main operators of the exploitation of molluscs, go to the fields which explains the abandonment of collection made difficult in any case by the increase in precipitation tions. It was at this season that the shrimp fishery is in full swing but this activity is, in some centers Fishing (Foundiougne), to continue throughout the year. The close time normally enacted annually by the governor of the region Fatick, is not always so or are not met (edema, 2004). Fishing is concentrated in the Bonga during the dry season, which is the best time to fish smoking.

Overall, the calendar of events show both a joint between activities and between maritime and land-maritime activities my land between them and each other. There also seems a third joint which is the market activities and food with each other. These combinations are all orchestrated by natural conditions, which are related to rainfall, migration of resources or simply the life cycle of re-natural sources. The dependence of populations towards re-natural sources is probably the most striking feature that emerges here. The nature of the pace of economic and social organization populations of RBDS.

Migratory movements of the actors and spatial representation fishing activities

Migration operators are related to levels of abundance of resources, business opportunities and climatic conditions questions. It should also distinguish between internal migration to the APCM carried out by local people, migration sub-regional (Table 2).

Internal migration to the APCM may be related to the concentration resources in a certain area. Thus, the climatic conditions questions trigger movements within the reserve, Like the rainy season which brings a portion of the population

Saloum agricultural activities to the detriment of the collection molluscs. The activities of shrimp concentrated in the seasonal sound of rain as well as pull trigger important song of regional migration. The dry season sees Revanche some villages on the island portion of Saloum, deserted by over 75% of the population, who goes to other sites more good fishing and closer to the possibility of disposing of products (UCN Senegal, 2001) (DEME, 2004)

The sub-regional movements are motivated primarily by at-related natural resources (including fisheries) and hence opportunities to work and gain. The ability to escape pressure Family also plays a significant role in the strategies migration because they have the chance to accumulate capital for its own account and not that of his family under extended (DEME, 2004). Business opportunities are also factors provoking introduction to real sectors of operation. The migrants may be either transformed or fishermen in this function of their expertise. Season the shrimp and season-to ethma lose, both commercially viable stocks of Saloum, also attract migrants from Gambia and Guinea Conakry, respectively.

The RBDS deficit would, however, the level of migration movements sub-regional territories, with significant movements of emigration about 75% (DEME, 2004; Dème et al., 2005), mainly

dry season, fishermen on the island portion of the reserve to other regions of Senegal, but also to neighboring countries (Guinea Bissau, Mauritania). However, the growing importance of phe- leads to transformation of the Bonga by Guineans since the end 1990s and consequently the opening of an outlet for this product has allowed some fishermen to find an occupation during the dry season and therefore reduced the importance of flow migration from the APCM.

Processing and marketing fish products

Chains increasingly outward-oriented

Streams from the exploitation of fisheries resources can be shown as a function of target species. Four sectors-primarily to be distinguished: that of the demersal, pelagic, and Sela- cians and molluscs. Figure 2 shows the estimated flow of these key sectors. It is intended, not to learn about exact quantities, but rather to document the routes taken by fishery resources of the reserve from catch to the marketing, through the transformation. Finally, it provides a synthetic vision of the business of fishery products- questions from the RBDS and thus constitutes the first of its kind.

The industry's largest by volume is the sector of pelagic transformed much of which is for markets African sub-region. This sector is crucial for procurement of the sub-region, especially at the pro- animal protein which is a main source. This sector is very dynamic because of the abundance of small pelagic fish in the region and by the ability to adapt to changing conditions tions operating (environmental, political, ...) which are shown by the players in the industry resulting in a important mobility Aunt of operations.

Another important sector is that of demersal, mainly sold in the state (fresh or frozen) to market Europe. The importance of this sector is more than the value of the pro- production volume that it generates. The prices on the mar- international markets for demersal species such quality are

that the majority of production from export to feed Western markets.

The fin market has experienced extraordinary growth in context of strong demand in the Asian market coupled with the devaluation of the CFA and the scarcity of the resource. What dynamic selachians bet fisheries in some areas of the Saloum as Missirah. The fins are dried for the Asian market—that in passing through the Gambia, which acts as a market bursting ment. Other products such as métorah and salty-dried Little is known about consumer Senegal and much of the production is exported to the African sub-region (Dème et al. 2005). Observed the disappearance of some species vulnerable (Ducrocq, 1999; Worms, 2002; Dème, 2004) is a sign before runner of the threat to this sector.

The molluscs are exported and little if any commercialization exists, it will be locally by-products transformed. This activity is essentially a sub-activity resistance and is of great importance as a source of protein for local people. Local supply is the fact that some of the pelagic fresh and processed that not pass through the domestic distribution channels and international and demersal second quality, unfit to markets West.

Women control channels

The traditional role of women in the fields of exploitation fisheries resources is the collection of molluscs, the fish processing and sometimes the marketing Lisati. This is mainly local, the shopping channels for domestic markets or international newspapers are the most often in the hands of male actors.

Fish processed and / or marketed by women are Most pelagic species of low commercial value. For molluscs questions, women involved in the whole chain, from collection to marketing and are therefore more or less master of supply. But here the viability of the operation of stocks, with the impact of a large collection of pressure from Foreign collectors, degradation of mangroves due to the cut

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Wood for smoking activities, construction or heating age
or siltation of some collection areas, which puts
endanger the sustainability of women's activities (Diadhiou et al., 2002).
The vulnerability of women's work involved in the activities
Operating fisheries is highlighted by the impact of
fresh markets and environmental degradation on their sup-
sion in raw materials. Few options available to them
to overcome this deficiency of raw materials. Women with low-
Wind easily migrate, like fishermen in the sub-region
to find a sufficient resource. Related to their homes, they
family obligations (childcare) such that only
young women without children and those with extended family may
care for children may migrate seasonally
or year to urban centers (SC Senegal, 2001). In cons-
point, they show on the earth plane of a dynamic which
gives a certain financial autonomy and thereby contributes to
reduce their vulnerability.

Table 3 shows the limits of influence and control of resident fish sources (channels) by the resident and accurate practice the line between resident and non-resident practice. The III courses are courses of consumption which in most cases are not subject to monetary exchange. In contrast, the-filiated res EEA are commercially important export sectors. This is for example the case of the shrimp industry, demersal, oysters Gambia and Guinea ethamaloses. It is clear from Table resident populations that do not have control of the process of marketing (and in many cases to that of the transition). The interference of foreigners in the process of transformation is visible to all fish products salted / dried. It is however hidden in many important fisheries economic importance (demersal elasmobranchs).

While many activities is the physical intervention of popu-resident populations, financing or control is subject to a external dependence. Traders exert pressure creates a phenomenon of "selling the fish until you have caught," is the case in the industry circuit Bonga Guinea. Executives of life and the interests of traders located in the centers city outside of the RBDS, the benefits generated by the Trade is invested outside the reserve. Overall, the situation hostage institutional is enhanced by the involvement of traders who wish to escape the economic and social world of the reserve. We can note that the process of recovery and commercial keting of fish products are closely linked as the market contributes to their specification. The general feature is a dominating low valuation and a lack of control of the process of commercialization by the resident populations of RBDS.

Conclusion

The fishery resources of the RBDS show alarming signs of exploitation of diamonds with the notable exception of certain stocks with large reproductive capacity (Bonga). The RBDS is far from a sanctuary protected by an invisible hand but as a place of exploitation of the resource. The simple fact is to build a reserve by no means guarantees its durability and does not in any way protect the resource, with the exception of the operation can be Industrial virtually impossible because of physical characteristics of the APCM (shallow, narrow channels).

Migration-related resource to the APCM are another example of the few cases that have populations of authorities and regulations. Foreign operators do not bother indeed feel no administrative constraints during the installation of basic fish processing and more often work in partnership with the local population (the case of Bonga). These uncontrolled migration threaten the sustainability of harvesting resources because the operators of these industries consider stocks as sources of short-term profit, using their capacity to migrate to other places for that the resource is exhausted.

Adding value is done by the maritime trade which does not benefit the resident population. The influence of commercial foreign manufacturers and the negative terms of trade leaves little up to the creation of economic surplus. The absence of channels controlled by the resident and the timidity of most people to engage in business transactions that come out of the borders of the RBDS explain this fact. More-faible is their propensity to process and market products of high commercial value. Thus, most of the added value of fishery products carried in the RBDS benefits the system external economic to the reserve. Moreover, this situation is worse by porous borders and lack of control by a part of the population, leaving the door open for a set of illegal and harmful to marine ecosystems.

Producers' incomes are low, it undermines the achievement of investment in production facilities or the improvement of living conditions in the RBDS. The reserve has how-

ing a positive cash transfer to the account of the exploitation
tion of fishery resources and activities of members of
resident families outside. In other words, the benefits RBDS
exploitation of resources beyond its limits: it is for the
less a paradox for a reserve that is supposed to pro-
duce excess biomass. It is therefore to find a
governance mechanism of distributive justice and more particularly
ment of social investment to set up to improve
lives of local residents.

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