

West Africa Report

Threats to Senegal's fishing sector: A case study from the Ziguinchor region

Barthélemy Blédé, Pascaline Compaoré and André Diouf

Summary

Fishing is of key socio-economic importance to the Senegalese economy, especially in the Ziguinchor region. However, the sector faces several challenges, including illegal fishing, insufficient infrastructure and weak human and material resources – particularly in the regional fisheries services. Senegal has learnt from experience that allowing local communities and professionals to manage sites where fish is unloaded seems to pay off, although the sector needs more initiatives of this kind. The major outstanding challenges are building fishing ports, and adopting or strengthening measures to counter the effects of dwindling fish species.

SENEGAL'S ATLANTIC COASTLINE is 718km long, with a natural continental shelf¹ of about 100km. Three major rivers² flow through the country, which has a favourable climate³ for fishing. These natural advantages contribute to making Senegal the second-largest fish-producing West African country, with an annual catch in the vicinity of 450 000 tonnes. Nigeria's catch is 530 000 tonnes, Ghana's 344 000 tonnes.⁴

Fishing contributes to food security for the Senegalese population, producing 47% of the required protein intake,⁵ and fisheries play a critical role in the social and economic life of the nation, providing jobs for an estimated 600 000 Senegalese (17% of the Senegalese labour force⁶ and 20% of that active in the sector in West Africa).⁷ Some communities are almost totally dependent on fishing as a source of income.

Yet this sector faces various constraints. In addition to all types of illegal fishing, there are difficulties associated with infrastructure, management, access to credit, monitoring, evaluation and environment. The natural phenomenon of coastal erosion also disrupts fishing.

This report presents the findings of field research carried out between 10 and 19 June 2015 in the Ziguinchor region, in the south of the country. It stresses the importance of

fishing activities to the region, analyses constraints and makes recommendations.

Ziguinchor, a region conducive to fishing

Casamance comprises three administrative regions, Kolda, Sédhiou and Ziguinchor. The Ziguinchor region, where the study was carried out, is composed of the following departments: Oussouye, Bignona and Ziguinchor.

Ziguinchor is naturally suited to fishing activities. The Casamance River flows for 300km through the region and has numerous branches (*bolongs*, in the local Mandingo language), which merge into the vast mangrove forest where shellfish, and especially oysters, can be harvested. The region also benefits from an 85km coastline.

In addition, it has a port in the city of Ziguinchor and several sites where fish can be offloaded, including Boudody, Elinkine, Cap Skirring and Kafountine. Elinkine and Boudody are sites on the river, whereas Kafountine and Cap Skirring are located on the coast.

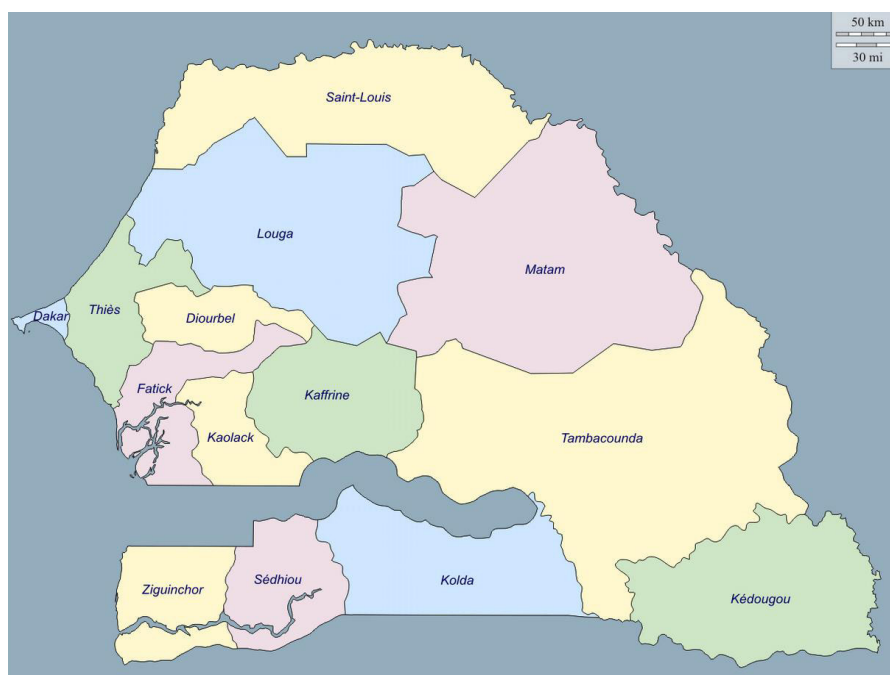
The river, the bolongs, the coastal front and the mangrove forest make the Ziguinchor region a major zone for fishing and for harvesting shellfish.

From subsistence to commerce

Despite these natural advantages, the indigenous population initially fished only for subsistence. Their major activity was farming.

Fishing for profit began to develop as fishermen gradually began to arrive from other parts of the country, particularly the Thioubalos, Niominkas, Lébous, fishermen from Guet Ndar and Gandiol. Fishermen coming from other West African countries like Ghana and Mali would later start up their own fishing activities in the region.

Figure 1: Map of Senegal



Source: www.solidaritesenegal.com/images/CASAMANCE/HistoireGeo/C.senegaladm.jpg
 Accessed on 02/10/2015

17%

THE PERCENTAGE OF THE
 POPULATION WORKING
 IN SENEGAL'S FISHERIES
 INDUSTRY

The rebellion in the Casamance region – ongoing since 1982 – resulted in the indigenous population gradually becoming professional fishermen. In fact, as a result of the armed conflict, the people of the Casamance region abandoned their villages and their fields to seek refuge in areas they considered safer, some of them becoming fishermen to survive. Fishing was no longer a simple subsistence activity, it became an important source of income. The scale of these activities has turned the Ziguinchor region into the third-largest in Senegal in terms of numbers of fishermen, coming after Saint-Louis and Fatick.⁸

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Scale of fishing activities in Ziguinchor

In 2014 the region's fishermen landed more than 53 000 tonnes⁹ of fish products (12% of national production). This volume came from 1 690 monthly canoe trips out to sea, along the river or in the bolongs. Of these boats, 583 had an outboard motor and 1 107 were rowboats. Of the 400 species of fish, crustaceans and mollusks to be found¹⁰ in Senegal 140 were caught. Small coastal pelagic fish such as Bonga shad and sardinella, the main species caught, are of relatively low market value. However, there are also high-value, so-called 'noble species' on the market. These are deep-sea fish (Sompat grunt and barracuda, for example), crustaceans (pink shrimp for the most part) and mollusks (such as volutes and cuttlefish). Sharks and rays are also highly appreciated in the region.

Landed catch is distributed between artisanal processing, local consumption, wholesale and industrial fish processing.

Artisanal processing is the key activity, using 66% of the catch and taking the form of smoking and drying.

Ostensibly the simplest of the traditional techniques, smoking is done in artisanal ovens, using species like Bonga shad, sardinella, and catfish, destined, primarily, for export to West African countries, particularly Guinea and Burkina Faso.

Figure 2: *Bolong* and the mangrove forest in Casamance



Source: www.lejecos.com/Casamance-la-relance-de-la-riziculture-de-mangrove-est-un-grand-defi_a1418.html
Accessed on 02/10/2015

Table 1: Classification by weight of the 10 main species landed at Ziguinchor in 2014

Landed catch	Weight (kg)	Unit cost CFA/kg	Total value (CFA)
Madeiran sardinella	16 716 100	82	1 370 720 200
Bonga shad	8 035 285	134	1 076 728 190
Sompat grunt	4 329 735	731	3 165 036 285
Catfish	3 829 255	385	1 474 263 175
Round sardinella	2 439 075	138	336 592 350
Volute (Gastropod)	1 915 075	346	662 615 950
Common smooth-hound <i>Mustelus Mustelus</i> (shark)	1 330 780	475	632 120 500
Pink shrimp (crustacean)	1 325 371	1725	2 286 264 975
Senegalese tongue sole	1 108 150	678	751 325 700
Guitarfish	1 058 270	547	578 873 690

Source: 2014 Statistics, Ziguinchor Regional Fisheries and Monitoring Services

Table 2: Classification based on value of the 10 main species landed at Ziguinchor in 2014

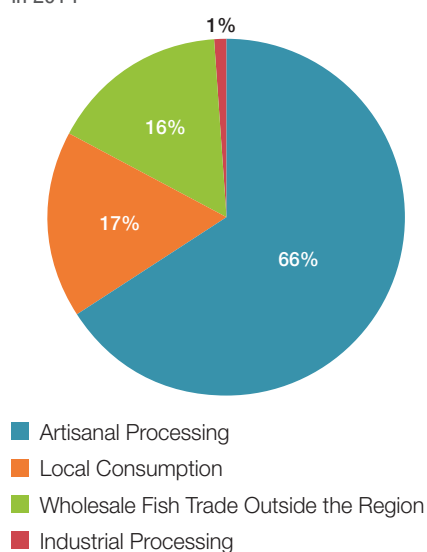
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Catfish	3 829 255	385	1 474 263 175
Madeiran sardinella	16 716 100	82	1 370 720 200
Barracuda (<i>bécune guinéenne</i>)	957 836	1 162	1 113 005 432
Bonga shad	8 035 285	134	1 076 728 190
Senegalese tonguesole	1 108 150	678	751 325 700
Volute (Gastropod)	1 915 075	346	662 615 950
Cassava croaker	870 435	733	638 028 855
Common smooth-hound <i>Mustelus Mustelus</i> (shark)	1 330 780	475	632 120 500

Source: 2014 Statistics, Ziguinchor Regional Fisheries and Monitoring Services

Drying is more complicated. For example, volute must be extracted from the shell, boiled, salted and then dried on open-air drying racks. Dried volute would mainly be exported to Asian countries, but it is also intended for local consumption. Sharks and other fish, such as guitarfish, are cut up, salted and dried before being sent to Ghana.

The largest clients for the wholesale fish trade are Kolda, Dakar, Thiès and Tambacounda. The seafood export company IKAGEL's fish processing plant, located in Kafountine, buys some of the fresh produce. This factory, with its main plant at Mballing (Mbour, 70 km to the south of Dakar), targets species such as shrimp, grouper or barracuda, which are favoured by the European market.

Figure 3: Distribution of fish caught in Ziguinchor in 2014



Source: 2014 Statistics, Ziguinchor Regional Fisheries and Monitoring Services

Challenges affecting the fisheries sector

Illegal fishing

Use of prohibited equipment

Nearly all fishing in the Ziguinchor region is done using monofilament nylon nets. Made from thin nylon mesh, these nets are prohibited by Article 66 of the Fisheries Code, which states: 'import, sale, purchase, ownership and use of sheeting material and gillnets woven from nylon monofilaments or multimonomofilaments are prohibited, unless a special waiver is granted'. Monofilament net is not environmentally friendly because it takes from 30 to 40 years to degrade and the tightness of the mesh prevents immature fish from wriggling through it. Those who use it claim the nets bring in a larger catch.

In Cap Skirring, for example, monofilament nets are made or repaired next to the quay, a few metres away from the offices of the fisheries agents, who claim they can do nothing about the large number of fishermen who use them because they have no alternative solutions to offer. Most of the Ziguinchor regional fishing professionals share this view. They all blame

Table 3: Destinations for artisanally processed produce from Ziguinchor, 2014

Destination	Total weight, in kg	Percentage (%)
Consumption in the Ziguinchor region (Bignona, Oussouye, Ziguinchor)	1 168 697	10,32
Transported to other parts of Casamance	1 366 630	12,07
Kolda	1 264 460	
Sédhiou	102 170	
Transported to other regions in Senegal	1 897 876	16,76
Exports	6 235 874	55,07
Burkina Faso	1 457 268	
The Gambia	303 590	
Ghana	991 399	
Guinea Bissau	92 520	
Mali	244 850	
Stock	652 580	5,76
Overall Total	11 321 657	100

Source: 2014 Statistics, Ziguinchor Regional Fisheries and Monitoring Services

the state, which, they say, simply issues prohibitions without offering any other options. Cotton nets, which disintegrate after only six to 12 months, are expensive and are more difficult to maintain and to pull up because they absorb far more water.

Excessive amounts of by-catch

Cap Skirring fisheries sector professionals complain that foreign deep-water rose shrimp industrial fishing vessels catch a variety of species, but only keep the pink shrimp. Species in which they are not interested (by-catch) are thrown back into the water but, for the most part, are lifeless. A boat that in a single catch can load 5 tonnes of fish is reported to keep only 200kg of pink shrimp.¹¹ 'This is, perhaps, unfortunate but it does not contravene any rules,' says a spokesperson for the Fisheries Protection and Surveillance Directorate (FPSD), adding that, for food security reasons, reviews are underway internationally to determine to what extent it can be made mandatory for vessels to land all the fish they catch.

An expert at the Maritime Fisheries Directorate (MFD), however, does not appear to agree. He believes that vessels licenced to catch shrimp that do not bring at least 10% of their catch back to port should lose their licence. Not to do so is considered

'cheating', because shrimp trawlers are authorised to use smaller-skein fishing nets than other vessels. It is, of course, possible that because shrimp trawlers do not want to be accused of 'cheating' they throw large quantities of fish back into the water.

Unlicenced fishing

All commercial fishing operations must apply for permission (licence or permits) in exchange for payment of a fee authorising the activity. The amount varies, depending on whether they are fishing with gillnets, by canoe, or from an industrial fishing boat and whether they are Senegalese or foreign nationals.

The cost of a permit for a canoe longer than 13m is 25 000CFA for Senegalese, while foreigners must pay 300 000CFA, a difference of 91%.¹² This encourages the use of fraudulent fishing permits, foreigners being tempted to use a Senegalese national's identity to obtain one.

What is more, Senegalese fishermen are sometimes arrested in the waters of Guinea Bissau for not carrying a licence. An agreement between Senegal and Guinea Bissau authorises Senegalese fishermen to fish in neighbouring waters, but they must carry a licence issued by the Guinea Bissau authorities. Requests all come to the Ziguinchor Fisheries Services officers, who must issue the licences for their compatriots. Despite this arrangement, Senegalese fishermen are alleged to enter Guinea Bissau waters without permission.

Senegalese fishermen are sometimes arrested in the waters of Guinea Bissau for not carrying a licence

Fishermen point out that the reason is bureaucratic delays and that files reach the Guinea Bissau administration late. The regional fisheries service, on the other hand, blames the delays on the fact that fishermen do not hand in their requests by the set deadline and some of them get fake licences issued in Guinea Bissau.

Fishing for immature fish

According to Article 127 of the Senegalese Fisheries Code, 'catching, holding, offloading, selling and marketing species with a weight or size lower than the authorized minima' is a serious offence. Fishing for immature fish not only endangers species reproduction but also reduces fishermen's earnings.¹³ Despite this prohibition, however, undersized fish are caught daily in Senegal, especially in the Ziguinchor region, both in water reservoirs and at sea. The sector is controlled by women processors and is interested mainly in small pelagic fish of the sardinella family that are in high demand in some West

African countries. Burkina Faso is the prime destination for these immature fish, with people from that country periodically setting up in the region to smoke and export the fish, which are also popular in Côte d'Ivoire and in Ghana. From a trading perspective, these are fish with a low commercial value.

Funding

Professional fishermen in the Ziguinchor region find it very hard to provide the guarantees required to benefit from external funding. Their main source of wealth is cattle, which, essentially, belong to the community, so individuals may not use them as guarantees. Quarrels would break out amongst families if goods were to be seized from a debtor who was unable to pay. This explains why fishing is, to a certain extent, controlled by foreigners, particularly Ghanaians, who fund local fishermen.

Infrastructure constraints

Absence of ports

A port is the principal type of infrastructure for fishing activities, a place to berth shipping vessels and offload the fish. It is also a logistical platform for the wholesale fishing trade, processing, storing and transporting fisheries products as well as making and repairing fishing equipment such as canoes and nets.

Regional fisheries authorities are understaffed and often lack the means to check and monitor all canoes

The Ziguinchor region is equipped with a port and with a 360m-long quay, 280m of which is reserved for trading ships and 80m for passenger transport vessels.¹⁴ Canoes are not allowed access and have a site set aside for them at Boudody. However, since Boudody is too shallow for canoes to remain afloat, the larger ones are allowed to berth along with the trading ships.

Fishermen from Kafountine, Cap Skirring, and Elinkine are not fortunate enough to benefit from a trading port despite the fact that large canoes bring back huge quantities of fish daily to Kafountine. 'Here, it is profitable to fish all year round. As you can observe, we fish daily and are not dependent on the tides.¹⁵ Despite this state of affairs, we do not have a port,' said a leader of the Local Council of Artisanal Fisheries (LCAF) in Bignona, the department to which Kafountine belongs.

Unsuitable sorting halls

The state of Senegal has equipped the main offloading sites with halls designed to receive, sort and sell produce to wholesale fish traders, but the halls are not always suitable. In Kafountine, for example, the hall is too small for the quantities of

fish offloaded. Part of the catch is spread out on tarpaulins as a result. This is a problem that should be solved when the modern hall, currently under construction and funded by the Regional West African Fisheries Project, is completed.

Deforestation

Apart from the 25 aluminium fish-drying racks offered by Spanish Cooperation and installed at Elinkine, all the racks we were able to see in the Ziguinchor region were made of wood. Wood is also used to smoke fish and boil volutes to extract the slime, and canoes are largely made of wood. All these factors pose a threat to Senegal's forests. However, an aluminium drying rack and modern ovens project is underway in Kafountine, thanks to a partnership with an economic interest group made up of the Kafountine Women's Union and UNWOMEN.

Problems with monitoring, evaluation and control

The fisheries sector in the Ziguinchor region benefits from the proximity of a Senegalese naval base located at Elinkine, with stations at Pointe Saint-Georges and at Diogué. The canoers pass through checkpoints at the base, where the naval officers seem more interested in whether or not there are weapons or drugs hidden aboard than in checking fishing equipment and the type of fish caught.

Furthermore, it is alleged that artisanal fishermen sell their produce without permission to industrial fishing vessels on the high seas, some of which do not make the requisite entries in their fishing logs.¹⁶ The maritime authorities do not agree with these allegations, claiming to trust observers who board the vessels.

Another problem is that the regional fisheries authorities are understaffed and often lack the means to check and monitor all canoes. In Cap Skirring there are only two officers and they have no form of transport whatsoever. Their control method for canoes with outboard motors is to issue sea-going permits authorising them to access subsidised fuel.¹⁷ Yet they barely have any control over the rowboats, which are not necessarily featured in the statistics reflecting the number of canoes actively fishing in Ziguinchor or in the rest of Senegal. This may distort the figures of the fishing fleet.

Fishermen from Katakalousse, Boudiediete, Cap Bolong and Bouyouye (the district of Cap Skirring), rowing their canoes, are not even aware that there are fisheries service officials based at Cap Skirring. One of the officers reported that he had to spend a whole night in one locality to raise the fishermen's awareness about an issue that concerned them. Never having met him before, they found it difficult to understand why he had suddenly appeared.

The sea is eating away at the shore

Coastal erosion is another problem in the Ziguinchor region. An example is Diogué Island in the Bignona department, where the broken walls of houses and coconut trees torn out by the roots are jumbled up on the beach. Foreigners, mainly Ghanaians who live on the island, have houses almost sitting in the water, whereas the local people have chosen to move to the centre of the island to live.

Sustainable fishing activities

Participatory management

Artisanal fishermen, wholesale fish farmers, processors and other professionals in the fisheries sector are organised into economic interest groups (EIGs). The various groups set up at each offloading site then come together to make up an inter-professional EIG to manage their activities jointly. Their presidents coordinate activities at the location with the help of a bureau on which nearly all the professional groups are represented. A local artisanal fisheries council (LAFC) monitors the EIG's activities and is chaired by the prefect of the department. The secretary is the head of the departmental fisheries service.¹⁸

All site facilities, including premises for the EIG, are made available by the state. The EIG levies fees that it must share with the municipality, based on a sliding scale that varies from location to location. At Cap Skirring, for example, the distribution is as follows: a 30% payment for the mayor's office, 20% for the EIG, 40% for a fund set aside for investments and 10% for training. At Boudody, on the other hand, the distribution is made before operating costs are deducted. The mayor's offices must, in return, collect the rubbish and ensure that sites receive street lighting, which does not always happen, according to people interviewed.

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In addition, each inter-professional EIG has its own specific issues. Boudody, with its under-equipped laboratory, has problems carrying out microbiological assays. These tests are supposed to be done every three months but are often done up to six months apart.

Fumigating the embarkations is also problematic and the EIG has to contract this activity out to private entities. Other problems are specific to particular sites. The Elinkine site has no electricity and is landlocked and it is difficult to transport products from there to the areas of consumption, while Cap Skirring's ice-manufacturing plant has been closed for several years, forcing wholesale fish manufacturers to get their ice from Ziguinchor.

The major concerns at Kafountine are the inadequate size of the sorting hall and the lack of drainage channels to evacuate waste water. The Kavountine EIG also deplors the absence of patrols in its maritime waters.

The IKAGEL fish processing plant is also facing constraints. Fish are smoked next

450 000
TONNES

THE ANNUAL CATCH IN
SENEGAL, MAKING IT THE

second
LARGEST FISH-PRODUCING
COUNTRY IN WEST AFRICA

Important dates

26 December 1982: Start of the Casamance rebellion

4 November 2004: Five marine protected areas are established at Abéné, Joal, Kayar, Saint Louis and Bamboung

31 July 2006: The National Agency of Aquaculture in Senegal is created

1 June 2010: For the first time, a local and community heritage area is established in the Ziguinchor region

8 October 2010: Local artisanal fisheries councils are created

25 April 2014: A fisheries agreement is signed between the European Union and Senegal

13 July 2015: New Act Code of Sea Fishing

to the plant, making it even more difficult to carry out maintenance, since ventilation ducts must be kept clean. IKAGEL also has problems transporting its product to the main factory. The Gambian customs authorities prevent refrigerated lorries from crossing their territory because they might be carrying weapons. This forces drivers to make a lengthy detour through Tambacounda, extending transport time by almost 40 hours compared to the 20 hours it would take if they could pass through The Gambia.

Abéné

The Ziguinchor region benefits from a 119 sq m protected marine area (PMA) at Abéné in the department of Bignona. The area was established by decree in 2004¹⁹ within the framework of a national policy to combat a scarcity of fisheries resources. The aim is the 'conservation of marine and coastal biodiversity (including sea birds), improved fishing yields, enhanced socio-economic gain from the sea for the coastal population, and greater mitigation of the effects of climate change'.²⁰

There is a total fishing ban in the marine area for six to seven months during the rainy season and when the area is open, only line-fishing and the use of cast-nets are permitted. Fishing methods likely to impoverish the water, like beach seine, purse seine, drift net and encircling gillnets are prohibited.

The PMA staff at Abéné (six, with just one technical officer), work with the fisheries services to ensure bio-ecological monitoring of the species, notably sardinella, sole and mullet. They also monitor marine turtles and birds. To promote reproduction they place spawning areas created from artificial reefs – made out of shells – at the bottom of the sea.

In the protected area officials work with the locals, who are more knowledgeable about the terrain. They also benefit from the expertise of the regional network of protected marine zones and the World Wildlife Fund.

PMA Abéné's major challenge is that it is located in the department of Bignona, which remains the most dangerous area of Casamance. Although security has improved considerably, civilians who have been affected by armed conflict fear the military. As a result, the PMA officials, who are normally required to wear uniforms and bear weapons to work, are forced to wear plain clothes and go unarmed.

Controversy over local and community heritage areas

The indigenes are allowed to set up local and community heritage areas (LCHAs) with objectives identical to those of the protected marine areas.

To establish an LCHA, a village, or group of villages, must be authorised by the commune and obtain permission from the departmental council, the departmental fisheries services and the water and forestry division, as well as from neighbouring localities. There are three LCHAs in the region, namely:

- Kawawana (abbreviation of a Djola word which literally means 'our shared inheritance, which we shall protect') of Mangagoulack, made up of eight villages²¹
- Kapak Olal ('this is coming to save us'), made up of 24 villages in the Mlomp commune
- Bliss Kassa (or small Kassa), made up of the island villages of Diogué, Hitou, Haere, Niomoune and Bakassouk²².

66%

THE PERCENTAGE OF PRODUCTS UNLOADED USED FOR ARTISANAL PROCESSING

The names of the LCHAs reveal why they were really created. Indigenous people are very attached to traditional values. Some of them worship forests or watering holes and cannot tolerate these spaces being sullied.

As a result, some of the bolongs are totally closed to fishing and others are reserved only for fishermen of local origin. Foreign fishermen – including Senegalese coming from outside the region – are allowed only in the river. Fishing methods and equipment that are not environmentally friendly are prohibited, wherever the fishing areas may be.

Some fishermen in the Ziguinchor region criticise this community policy because they see the LCHA as a means of preventing non-indigenous fishermen from working. They believe the LCHA members do not always destroy the unauthorised nets they confiscate, but use them instead. The regional fisheries services are also accused of ‘complicity’ in what is seen as discrimination.

Disagreements amongst LCHA supporters and opponents can assume alarming proportions. Inhabitants of Kadjinor village, outraged about the bad behaviour of foreign fishermen, are alleged to have confiscated all the fishing motors and equipment at an offloading site and stored them in a sacred forest. The offenders had to pay fines to the village community to get their possessions back. Such conflicts should draw the attention of the government to addressing issues of the legal status of the LCHAs. This is all the more important since, were the Casamance case to contribute to curtailing fishing losses, it could be replicated in other regions throughout Senegal.

Aquaculture

According to a representative of the Ziguinchor regional fisheries service, the lack of interest of professional fisheries in aquaculture can be attributed to the fact that fish from a farm would be more expensive than fish caught by fishing activities.²³ The higher price of farmed fish also has to cover salary overheads, fertilizer and the time it takes for fingerlings to reach maturity. For example, a fish farm operator will not agree to sell catfish at 385CFA per kg (the average price on the market), unlike the bolong fisherman, who have much lower overheads. The law of the market means farmed fish does not have many takers or has to be sold at a loss.

Aquaculture will attract professionals only if it receives state support. The Senegalese government seems to have understood this and, in 2006, it established a national aquaculture agency. The Sédhiou region was selected as a fish farm zone, with the creation of 25 farms. The success of this project could have positive ramifications for the whole of Casamance.

Recommendations

- 1 Fishing activities in the Ziguinchor region are so important that fishing ports need to be built at Kafountine, Cap Skirring and Elinkine. The Ziguinchor port should be developed so that fishing vessels can berth. Ports stimulate activity, make it possible to monitor vessels from the quay and will do away with the dangers fishermen and dockers face when offloading cargo.
- 2 Senegal should strengthen its fisheries administrative services with more field staff and the requisite logistics. The operational staff, who currently number a maximum of two officers per site, are unable to cover the length and breadth of the large fishing zones.
- 3 Initiating policy to break down the walls of distrust between fisheries administrators and canoers, over whom the state barely has any control, is highly desirable. The Senegalese authorities could, for example, do away with fishing permit for rowboats and, in return, require registration. Such a measure would make it easier to manage the smaller boats and get more precise statistics about the fishing fleet.
- 4 The state should adopt more measures to encourage biological rest and species reproduction. This implies continuing to create protected marine areas on the one hand and elucidating the legal status of local and community heritage areas (LCHA) on the other. The state could then, whenever necessary, extend the LCHA policy to other regions of the country.
- 5 There is a need to further promote state policy for participatory fisheries management through the creation of local artisanal fisheries councils (LAFCs). The LAFCs should ensure rigorous monitoring of funds allocated to maintenance and building facilities (reserve funds) as well as to training.
- 6 Aquaculture, which can be considered as an alternative to dwindling fisheries resources, requires further support from the state through subsidies or leveraging donor resources.
- 7 Other West African coastal states could draw on this participatory management policy, which enables artisanal fisheries professionals to take charge of themselves.

Conclusion

Nature has endowed the Ziguinchor region with an abundance of fish. This natural advantage has transformed fishing into a major socio-economic activity in a region that still bears the brunt of the Casamance rebellion.

However, the sector faces major challenges, amongst which are illegal, undeclared and unregulated fishing, inadequate port facilities, funding access constraints, deforestation and coastal erosion.

Several initiatives have been adopted to counter these, the most important being participatory fisheries management and the creation of protected marine areas. Setting up local and community heritage areas may also contribute to curbing the erosion of resources if they are granted clear legal status so they can prevent conflicts between fishermen from within and outside of the locality.

Notes

- 1 www.un.org/depts/los/clcs_new/submissions_files/preliminary/sen2009informationpreliminaire.pdf
- 2 Rivers Senegal, Gambia and Casamance.
- 3 A seasonal hot wind blows off the coast, creating a phenomenon known as 'upwelling', which is propitious to the proliferation of marine life. Cold waters rise to the sea surface carrying nutritional elements on which the fish feed.
- 4 www.ictsd.org/bridges-news/passerelles/news/la-p%C3%A4chet-les-produits-halieu-tiques-en-afrique-de-l%E2%80%99ouest-un-march%C3%A9
- 5 Average fish consumption in Senegal amounts to 26kg per capita, higher than the global average of 19kg per capita, according to FAO statistics from 2014. There are an estimated 120 fishing boats and 22 000 canoes in the Senegalese fishing fleet.
- 6 www.memoireonline.com/01/14/8653/Contribution--la-mise-en-place-d-un-dispositif-de-gestion-concertee-de-l-aire-marine-protegee-d.html
- 7 www.ictsd.org/bridges-news/passerelles/news/la-p%C3%A4chet-les-produits-halieu-tiques-en-afrique-de-l%E2%80%99ouest-un-march%C3%A9
- 8 Saint-Louis, Fatick and Ziguinchor make up 19.6%, 15.6% and 15.3% respectively of the population working in fisheries and aquaculture, www.ansd.sn/ressources/RGPHAE-2013/ressources/doc/pdf/2.pdf
- 9 2014 Statistics, Ziguinchor Regional Fisheries and Monitoring Services.
- 10 www.cbd.int/doc/world/sn/sn-nbsap-powpa-fr.pdf
- 11 Data gathered on 12 June 2015 at Ziguinchor.
- 12 A line-fishing licence costs 5 000CFA for nationals and 100 000CFA for foreigners; national fishermen in canoes measuring 1 to 13m pay a fee of 15 000 CFA and foreigners pay 200 000 CFA.
- 13 Mature fish weigh more and bring in more money.
- 14 Three passenger transport boats, namely *Aline Sitoé Diatta*, *Aguène* and *Diambogne* ply the Dakar-Ziguinchor crossing at least twice a week.
- 15 Rising tide – which in this context means the duration of a fishing expedition – usually lasts more than one day (3 to 7 days on average). However, at Kafountine, fish are so plentiful during this time that fishing boats stay at sea for just a few hours.
- 16 They are said to fish illegally or exceed the quotas granted by their licences.

- 17 Fishermen receive a state subsidy for fuel for their canoes. The fuel is sold by petrol stations located at the disembarkation sites.
- 18 The state gives these installations to local communities, who, in turn, hand the management and operations over to professionals organised within a local inter-professional association, http://old.icsf.net/icsf2006/uploads/publications/monograph/pdf/french/issue_44/chapter236.pdf
- 19 According to the motivations note for Decree n° 2004-1408 of 4 November 2004 setting up protected marine areas, 'promoting protected marine areas constitutes a definite advantage for conservation of the structure, operations and diversity of the ecosystem: reconstruction where degraded, improved yield from fishing, and social and economic benefits for local communities'. The other functional PMA are those of Joal, 110km to the south east of Dakar; Kayar, about 58 km to the north of Dakar; Saint-Louis, at the mouth of the Senegal River about 264km from Dakar; Bamboung in the Sine-Saloum estuary, 130 km to the south-east of Dakar, and finally Sangomar in the Saloum Delta. A protected marine area is being established in the Niamone district.
- 20 Objectives written on nameplate indicating the location of offices for the protected marine area.
- 21 S Sambou, 'Kawawana: Aire du patrimoine communautaire de Mangagoulak, Casamance (Sénégal)', <http://aires-protegees-aird.cirad.fr/PDF/CHATELAIN.PDF>
- 22 www.ideecasamance.net/uploads/1436343202_APAC.pdf
- 23 Information gathered in Ziguinchor on 11 October 2015.

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About the authors

Barthélemy Blédé joined the ISS in May 2014 as a senior researcher in the Conflict Management and Peacebuilding Division in the Dakar office. Before joining the ISS, Blédé was chief project officer for the implementation of the International Ship and Port Facility Security Code in the Port of Abidjan. He also occupied several positions in the Ivorian maritime administration. He has degrees from the World Maritime University in Malmö, Sweden; the School of Administrators of Maritime Affairs in Bordeaux, France; and the University of Abidjan.

André Diouf has been an intern in the Conflict Management and Peacebuilding Division at ISS Dakar since February 2015. He holds a master's degree in public law from Gaston Berger University, Saint-Louis, Senegal.

Pascaline Compaoré has been a junior fellow in the Conflict Prevention and Risk Analysis Division at ISS Dakar since May 2015. She holds a master's degree in public international law from the Centre for Studies and Research on General International Law and Human Rights in Ouagadougou, Burkina Faso.

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ISS Pretoria

Block C, Brooklyn Court
361 Veale Street
New Muckleneuk
Pretoria, South Africa
Tel: +27 12 346 9500
Fax: +27 12 460 0998
pretoria@issafrica.org

ISS Addis Ababa

5th Floor, Get House
Building, Africa Avenue
Addis Ababa, Ethiopia
Tel: +251 11 515 6320
Fax: +251 11 515 6449
addisababa@issafrica.org

ISS Dakar

4th Floor, Immeuble Atryum
Route de Ouakam
Dakar, Senegal
Tel: +221 33 860 3304/42
Fax: +221 33 860 3343
dakar@issafrica.org

ISS Nairobi

Braeside Gardens,
off Muthangari Road
Lavington, Nairobi, Kenya
Tel: +254 20 266 7208
Fax: +254 20 266 7198
nairobi@issafrica.org

www.issafrica.org

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