

## West African fisheries at a deadlock or why migration is not the solution anymore

### Introduction

The fisheries sector in West African countries is of paramount importance as a critical source of economic, social, environmental and cultural value for West Africa's growing population of almost 300 million people: fisheries can represent up to 15% of national GDP and up to 30% of export revenues, employs around 7 million and provides up to 50% of total animal protein intake of the region's population while sustaining local livelihoods for coastal communities (OECD, 2008). More than 70% of the fish production in the region comes from artisanal fishers, Senegalese and Ghanaian fishers being the most active groups along the regional coastline, from Mauritania to Sierra Leone. The predominance of these migratory fisheries in the 7 members States of the Sub-Regional Fishery Commission is made possible through a generalized practice of long-distance fishing migrations (Haakonsen, 1991).

Yet by 2000, signs indicating the regional depletion of the main fish stocks had become more pronounced, while the region serves growing global demand on the one hand and tries to develop an economically viable fisheries sector at home on the second hand. This begs the question as to how long would fish resources be able to sustain intensive small-scale fishing and especially activities of migratory Senegalese fishers and others? The limited attempts to date by national authorities to control this phenomenon (including, for instance, the limitation of fishing licenses given to foreign fishers), are undermined by both fishers circumventing these controls – and the limited enforcement capability of the authorities over such large marine areas. As a result, while migrants continue to operate furtively and far from capitals, this phenomenon of fisher migration, which has long remained unknown or ignored, has gained interests among national policymakers from West African countries. But isn't it too late for undertaking action?

This article aims to provide a review of the evolution of migratory processes by small-scale fishers along the coasts of West Africa over the past and more especially over the last three decades. The paper also intends to give some further evidence on the need for strong action to take place in fisheries management, while migration – migrations of Senegalese fishers in the first instance -has led West African waters to a generalized depletion of fish stocks. The first section of the paper documents the development of the artisanal fisheries sector over the past and why fishing migrations have thrived since the 1970's. . In the second part we link the development of fisheries to fisher migrational trends and how migrations have modified to adapt to the overexploitation of fish stocks. The third part presents the migration trends and gives further information on Senegalese migrants' strategies. The fourth part exposes the reasons why West African fisheries have reached an ecological and social deadlock. The article concludes by first providing the vision from authors on the future of migrations and the alternatives for migrant fishers and second suggesting some tracks for actions from policymakers towards the recognition of the importance of fishing migrations, the role of regional cooperation and the integration of migration issues within conservation projects. The choice was made in this paper to focus on the Senegalese fishers. These are, along with Ghanaian fishers, the most important in terms of both the magnitude involved, and the diversity of same. It is estimated that over 15 000 fishers (30% of the total national labour force in the sector) have left their homes and sailed into foreign waters.

## Research and method

The data provided in this paper come from both an extensive literature review on the subject of Senegalese migratory fishers in West Africa and field research conducted during the period 2007-2009 in Senegal but along the coast of West Africa as well, from Mauritania to Sierra Leone. The review of literature followed two tracks: the demographic literature that deals with population move over time, be they fishers or not and living on the coast or in the hinterland and the literature on the fisheries sector in Senegal and in the sub-region, which raises the question of migratory fishing as one of the fishing strategies adopted. The demographic literature on migrating fishermen is very poor: migrant fishers do not fall into the major categories of interests in demographic studies, such as rural-urban migration and trans-continental migrations (Randall, 2005). The fishery literature on fishermen migration in West Africa is of same level: impacts of migrant fishers on the marine environment (and vice-versa) have been neglected there, while it retains consideration in other regions of the World (Aburto, Thiel et al., 2009; Bremner and Perez, 2002; Cassels, 2006; Kramer et al., 2002). Only social sciences has shown interest in migrations of West African fishers in the 1970's and 1980's with a number of key publications on sociological dimensions of fishermen seasonality moves (Binet, 1973; Chauveau, 1986; Jorion, 1988; Nguyen Van Chi-Bonnardel, 1980). The sociological attention dropped significantly in the 1990's, despite two majors events on fishermen migration<sup>1</sup>. The Sustainable livelihood Fishery Program, that embraced 28 West African countries, revived early 2000 the attention on fishermen migration by considering it as one of the strategies that fishing communities often use in order to secure their livelihoods (Njock and Westlund, 2010). More recently, the thematic of migration has gained a new interest with climate change concerns. Been approached from the point of view of forced migration, environmental refugees and the governance challenges inherent to that (Warner, 2010), it makes a conceptual link between environment degradation and economic behaviour such as the abandon of fishery to migrate to Europe (Sall, 2007). Thus, there is currently an urgent need to update knowledge on migrating fishers in order to gather interest from national decision-makers and international donors and improve policy coherence in development and environmental conservation in the West Africa region.

### CARTE de localisation ???

The field research in the destination countries was conducted based on a double investigation. First, a collaborative work with national fisheries research centres in Senegal and in the six countries of the study led to the filling-in of standard templates for each migratory move. The templates enabled to gain an extensive background on migrations from the origin sites in Senegal to the countries of destination in the six other countries. Information gained in templates revolved around: migrant ethnic group, recent history of migration and trends, details on fishing production (i.e. targeted species, fishing boat, technique, annual catch per boat, mean value of catch), details on value chain (landing site, final country of destination, processing), organisational aspects of migrations (financing of production means, organization among production units, supply of food and material when at sea, hiring of crew, etc.), institutional aspects (access rights, licences, etc.), nature of relations between local and migrant fishers, etc. Second, research revolved around semi-directive interviews in main sites of departure for Senegalese migrant fishers (i.e. Saint-Louis, Gandiole, Dakar, the Petite Côte and Casamance). Interviews were conducted with various stakeholders (fishers, local representatives, fishmongers and fish processors) that has also enabled to shed light on the evolution of the value chain over the past three decades. Semi-directive interviews were also conducted in destination countries where the fishing operations are conducted. Interviews were carried out with representatives of fishers, both local and migrant, in fishing camps where Senegalese fishers

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<sup>1</sup> Two major workshops have been organized in early 1990: a regional workshop in Accra (Ghana) in November 1990, precisely on the migration of small-scale fishers in West African region and host by FAO (Haakonsen and Diaw, 1991) and a seminar organized by the Norwegian Cooperation in Bergen (Norway) in 1993 on the small-scale fisheries in West Africa and perspectives from the social sciences (Chauveau et al., 2000).

have been spotted over the past three decades. These interviews were conducted all along the coast in main sites in Mauritania, the Gambia, Guinea-Bissau and Guinea. Importantly, field research has aimed to select only migratory moves for which data was collected at both their point of departure –which are in most cases where the landings take place - and the area of destination. This has allowed to cross-check collected information and verify the accuracy of data provided as part of interviews with fishing operators in the one hand and as part of national research data provided by national research centres in the second hand. The development of migratory fishing until the thrive of the 1970's

As far as the 16<sup>th</sup> century, sailors were reported to go at sea onboard canoes in order to fish, but also for trade or military purposes (Chauveau, 1986). With the adoption of sail at the beginning of the 17th century, African fisherman have fished sometimes far from their home shore following the migratory movements of fish as they move to spawn in certain areas.

At the end of the 19<sup>th</sup> century, migration of Senegalese fishers extended across the whole sub-region, from Mauritania to Sierra Leone (Chauveau, 1991; Gruvel, 1908). At this time, many West African countries relied on the export of primary products (Arabic gum and palm trees products, peanuts, rubber production, coffee and cocoa) supplemented by an 'informal' economy which saw trade between small holders in rural areas and the urban centres located on the Atlantic coast<sup>2</sup>. As the informal economy grew, small-scale fisheries also benefited and gradually switched from subsistence fishing based on in-kind transactions into an artisanal activity for commercial purposes (Nguyen Van Chi-Bonnardel, 1980). New outlets for exports also acted as a catalytic factor and migration increased in search of higher valued species (such as grouper, sole, meagre, etc.) with European processing and export industries in the 1940s and 1950s essentially reliant upon small-scale migrant Senegalese fishers for their supply. Thanks to technological progress, the range of migrant fishers (most notably the Ghanaians and Senegalese) has grown since the 1950s, with many only periodically returning to their villages of origin. This was possible as, in neighbouring countries such as Guinea-Bissau, Sierra Leone and Liberia, fisheries were still rudimentarily developed and resources were much more plentiful. The major 'push' factor to the development of fisheries in Senegal has been the repeated droughts experienced by farmers during the 1970s (Tricart, 1993). These droughts caused substantial rural flight, and marked the end of cash crop farming as a driver of the Senegalese economy. The fisheries sector was the most welcoming economic sector for these expelled rural populations for three reasons. These droughts thus caused a sharp inflow into the sector, with the fisher population multiplying 3 to 4 times within a decade.

The massive thrive of the sector and subsequent adoption of fishing migration as the main strategy was enabled by three main conditions. First, national development programmes and donor support provided canoes and fishing gears at low cost to new entrants. Programmes dating from the 1950s supported fleet motorisation, and by the 1970s, more than 90 per cent of the fleet was motorised (Sal and Morand, 2008). Second, this motorization allowed both new and established fishers to quickly access new fishing grounds and, coupled with the development of new fishing techniques such as the drifting gillnets or the use of onboard ice box, this enabled fishers to increase their productivity. Third, the expansion of export markets following the Yaoundé (1963) and Lomé (1965) Conventions, which offered preferential access to European markets for primary products [including fish] originating in the 47 ACP countries, saw fishers migrate in pursuit of high value species, the task of catching low value species being progressively delegated to non-motorized canoes and subsistence fishing for the local markets. Senegal became one of the main exporters of raw and processed fish products to Europe - through both European processing industries located in West Africa and the export of raw material to national markets such as Rungis in

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<sup>2</sup> For further information on the history of navigation and fisheries in West Africa from the 15<sup>th</sup> century, see Chauveau (1986).

Paris and the Puerto de Toledo market in Madrid. When fishing migrations help balancing the depletion of fish stocks

The 1980s mark a turning point in the development of the fisheries sector and related fishing migrations. Historically, migrant fishing had occurred upon a local seasonal cycle, punctuated by a return to the home village located in one of the main three departure regions of the country (Saint Louis in the north of Senegal, the Dakar peninsula and the *Petite Côte* south of Dakar, and from the Siné-Saloum delta). Migrants tended to return to their homes during the rice planting and harvest seasons, subsequently undertaking what Cormier-Salem (Cormier-Salem, 1995, 2000) call 'route' fishing – the route being punctuated with stops in coastal cities where catches are landed.

By the 1980s however, the main commercial stocks were showing signs of depletion under the continuous pressure of migrant fishers, not only in the Senegalese EEZ but also in adjacent foreign waters. Long-distance industrial foreign fleets operating under fisheries access agreements also saw catches decline by between 20 to 40% between 1996 and 2007 (cf table 1 below). What was true for West Africa was even worse for Senegal, with grouper stocks experiencing an 80% drop in population in the decade to 2000, as fishing exploitation in the region went far beyond the biological threshold (Dahou and Deme, 2002).

**[Table 1: Evolution of catches and exploitation levels of main commercial species [35] ]**

In the context of growing resource scarcity, Senegalese migrant fishers had no other choice but to extend their migration area and exploit new stocks (Bakhayokho and Kébé, 1991). This option was possible due to:

- The very high prices for high-value species on the export market (Kébé, 1993);
- Unexploited fishing zones (as in the case of the Bijagos Archipelago in Guinea-Bissau, or the isles of Tristao and Alcatras in Guinea where fishing was largely still for subsistence purposes); and
- The lack of controls and regulation over such fishing, despite the creation of EEZs after the third United Nations Conference of the Law of the Sea (1983), when formal access to foreign EEZs was then subject to licenses (as opposed to formerly when local arrangements could be made with traditional local authorities).

Progressively, a new form of migration emerged. The seasonal character of migration faded, as did journeys to the home villages during the rainy season. Now at sea all year long, migrant fishers forsake a permanent home for year-long 'temporary' habitation close to their current fishing grounds. Mostly composed of very young men, these migrants are motivated by the desire for monetary gain, a desire which is strong enough to keep them living in bad conditions and far from their home almost all year (Odotei, 1991; Overa, 1991). In other words, the migration scenario causes them to suspend the tradition of regularly returning home with revenues for their families.

This change from seasonal part-time movement when fishing was practiced as a part-time activity to long-term migration when fishing is a full-time job is of particular importance in the history of fishing in West Africa. It corresponds to the moment when fishing migration became forced migrations. For Jorion (1988), there is a difference between seasonal movement and migration *per se*. For him, "becoming a full-time fisherman (when one has been a part-time one) is never a voluntary choice. It is something one has been forced into doing by adverse circumstances. One may (...) consider it as a 'universal) sociological law that *no one becomes a full-time maritime fisherman other than under duress.*"

## The modern visage of fishing migrations: multiform and efficient

Two<sup>3</sup> organisational changes have contributed to the permanent establishment of fishers in foreign EEZs. The first relates to the development of fishing camps far from economic routes and urban centres – sometimes located in mangrove zones or on small isolated islands. The second relies on the movement of canoes between fishing grounds and landing sites in Senegal.

In the first instance, the provision of fuel and ice is no longer organized from the home landing sites in Senegal but directly at the new landing sites that have been established in the host countries. Some of these sites have been built with the help of international co-operation projects in areas close to important fishing zones (such as on the isle of Canhabaque in the Bijagos Archipelago, Guinea-Bissau). In most cases, these landing sites are also permanent camps where fishers may settle down. Equipped with several units for processing (smoking and drying) of low-value essentially small pelagic species, camps are in a sense economic enclaves linked with the migrants' origin country -operating continuous back-and-forth transportation of fish in canoes (which can ship a maximum of 30 tons per trip). The return canoe trip imports fuel, food, and fishing gears into the camp.

The second form of migration is less visible since fishers never disembark from their canoes. Yet, it is of major economic importance, responsible for 60% of fish export volumes, some 80,000 tonnes annually, to the EU (Binet and Failler, 2011). Trips last a maximum of 10 days (the maximum time for conservation of fish in ice), and is undertaken jointly by two similar canoes with the same stocking capacity, same speed, same speed and same number of crew. In the case of ports set on the *Petite Côte* (M'bour, and Joal) toward the Bijagos Archipelago, the canoes take two days to reach the fishing grounds, spend six days setting and hauling nets, before returning to the home landing sites in Senegal with more than six tons of *thiofs* (groupers), red snappers, sea breams in the hold. While this form of migration is similar to that developed in the 1970s - when fishers headed back to Senegal every ten days - it is very much a novelty for those whose homes are in coastal villages such as Ziguinchor, Joal, M'bour, Soumbédioune, and St. Louis.

Accompanying these developments, there have also been changes in the targeting of certain species. For instance, while shark fishing had been practiced for decades in West Africa, the activity intensified greatly in the 1990s driven by the demands of the Asian market where shark fins are sold at 350 Euros per kilogram. The localised expansion of shark fishing was, however, limited by the physiological limits of selacian stocks (which are characterized by a long life cycle and a very limited renewing of spawning stock biomass), and saw Senegalese shark fishers turn to in Gambian, Bissau-Guinean, Guinean and Leonese waters in order to sustain production levels.

From an economic perspective, research estimates suggest almost 100 000 tonnes annually were harvested by Senegalese migrants in foreign EEZs – compared to about 400 000 tonnes that are harvested domestically (Binet and Failler, 2011). From a spatial perspective too, these new forms of migration are now not just limited to Senegalese fishers but are omnipresent in the whole sub-region (see Map 1 below and Table 2 at the end of article). In the case of Wolof fishers, for example, from the suburbs of Guet N'dar (identified by the code GD on the map) and Gandiole (coded G on the map) in the region of Saint Louis, these migrations extend towards:

- Mauritania from the Saint-Louis region by Wolof fishers (see flow coded GD1 on the map 1);

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<sup>3</sup> A third form of migrant fishing, where (tens of) canoes are subcontracted to catch fish on behalf of industrial vessels has emerged since the mid-1990s. This type is not considered here as there is little information available on the phenomenon, although a Korean vessel was recently captured in Guinea-Bissau - along with thirty Senegalese canoes that were fishing for her.

- The Petite Côte, the Gambia and Casamance from Guet N'dar and Gandiole in the region of Saint Louis (GD2, G1) ;
- The Bijagos Archipelago, south Guinea-Bissau and north of Guinea from the Petite Côte (GD3, G2); and
- Guinea and Sierra Leone from Guinea-Bissau (GD4, G3).

Lébou fishers originating from the region of Dakar migrate southwards as follows:

- Towards the Petite Côte from the Dakar peninsula (Lé1) where they set permanent habitation
- Further south to the Gambia and Casamance (Lé2);
- To the Bijagos Archipelago, south Guinea-Bissau and north of Guinea directly from the Dakar peninsula and from the Petite Côte (Lé3); and
- To Guinea, Sierra Leone and further south to Libéria directly from the Dakar peninsula and from the Petite Côte (Lé4).

The Nyominka fishers originating from the Saloum delta (Ny on the map) migrate to the *Petite Côte* (Ny2) where they can find outlets for their production. They also migrate southward to:

- The Gambia and Casamance (Ny1) from the delta of Saloum and Petite Côte;
- Guinea-Bissau and Guinea (Ny3) from Casamance; and
- Guinea and further south to Sierra Leone and Liberia from the Bijagos Archipelago (Ny5).

Also, albeit to a lesser extent, the Diola fishers from Casamance (coded as Di on the map and table) migrate to the south to Guinea Bissau (Di1) and also to the Gambia (Di2).

[ **Figure 1: Map of Senegalese migration dynamics in 2008**]

### **Fishing migrations at an ecological and social deadlock**

As we have earlier noted, until the 1980's, fishers migrated in order to follow the trajectories of migratory species (essentially small pelagic species), or to focus on areas where fish were concentrated (spawning aggregation areas for instance). Migrants simply redeployed their fishing effort from one species to another, thereby ensuring a sound distribution of fishing effort in space and time. This strategy was modified a decade later as extended migration became a means to compensate for the lack of resources in their traditional fishing zones.

Most of the catches by these migrant fleets are neither known, nor accounted for, in national statistics as landings are not carried out in the country from whence the migrants are originated, and/or landing sites are too remote to be covered by national fisheries survey (Laloë, 2007). Where catches are monitored, the fishing location is not noted – and catches are automatically treated as being domestic catches. Consequently, while statistical data in the area where the catch occurs is/are understated, national statistics in the migrant's home countries is skewed by this artificial increase in production accruing in foreign EEZs. This not only gives misleading catch data (vis-à-vis catch origins), but also makes it very

difficult to provide accurate scientific advice on the status of stocks - and hence inhibits the development of effective management plans.

Since the establishment of national EEZs, nations of migrant fishers have been obliged to access foreign fishing grounds through the conclusion of fisheries agreements. These agreements generally revolve around the total number of canoes allowed to fish in foreign EEZs, but levels of total allowable catch or limitations on the harvesting of certain species are not specified. Additionally, restricted maritime control capacity and widespread corruption has led the number of migrants' canoes to largely exceed the total authorized number. In parallel, illegal fishing by migrants in Marine Protected Areas (MPA) is commonplace, being particularly damaging for the marine environment since it is concentrated in ecologically significant areas. Be it in Biosphere Reserves (such as in the Bijagos Archipelago, or to a lesser extent in the Park of Banc d'Arguin) or in a MPA in the process of being implemented (e.g. Tristao and Alcatras MPA in Guinea), migrant fishers activities totally undermine biodiversity protection and marine ecosystem conservation. As a result, the 'fishers' migrations' issue is very much a challenge for both the regulatory framework for fisheries management as well as the conservation of marine ecosystems in MPA.

Furthermore, the concomitance of environmental degradation and migration has proved to create potential for violent conflicts [32]. As activities of migrant fishers are increasingly conducted in traditional fishing zones of (foreign) local communities, this decreases their catches and can in turn force them to leave their historical fishing ground (Failler et al., 2009). Consequently, in spite of the contribution of migrant fishers to the economic and social development of the local communities where migrants are installed (e.g. creation of jobs, sources of revenues, exchanges between local and migrant communities, etc.), there are increasingly conflicts between local and migrant populations, conflicts which can lead to a rejection of migrants, and their expulsion from the host villages. In terms of rebutting controls imposed on their fishing activities or resolving the conflicts that may arise with local populations, migrant populations often have no rights. It is therefore necessary for migrant fisherman to first legitimate its presence in foreign waters in order to benefits from rights in these countries.

### **The future of migrations: catch the last fish or flee to Europe?**

The drought of the 1970s provoked a massive rural flight which greatly inflated the total number of small-scale fishers in West Africa, and Senegal in particular. Migratory fishers from the region of Saint Louis, Dakar, and/or the Petite Côte took advantage of the abundant resources in neighbouring foreign fishing zones, and were aided in these endeavours by both international co-operation programmes, national development strategies, and the opening of new export outlets. Over the two last decades, fisher migrations have escalated and the number of migrants has exploded. Fishing zones have progressively become more remote, and further from the migrants' origins. The seasonality of migration has been replaced by a search for new fishing grounds following the collapse of fish stocks in Senegal. Landings which are the results of transnational migrations, while already equivalent to a quarter of total domestic production are increasing in proportion.

One can wonder about the future of fisheries in the region if nothing is done to counterbalance this phenomenon. The migrant fishers will have only two alternatives to go on fishing: first, migrate into evermore remote areas in search of fish and second, intensify their fishing activities in already overexploited zones, using more efficient – and destructive – techniques or turning towards new species. If the first alternative will force them to even more sailing, sometimes leading to a life spent onboard canoes, the second alternative is no better: increasing operational costs due to the increasing efforts to catch scarcer and smaller fish and more illegal fishing conducted in protected areas or using banned techniques.

Often, some fishers have already adopted a third alternative and turned towards illegal migrations to Europe. Migrations via maritime routes have largely increased since the closing of Spanish landlocks in Morocco: hundreds of fishing boats leave Senegal or Mauritania to the destination of Canarias islands. Fishers not only organize this illegal transport but also take part to these migrations and stay in the Canarias. Senegalese government has taken benefits in the short term from this in getting European funds to establish rural development programmes involving young migrants who had been resent from Europe to Senegal (Dahou, 2008).

## Potential tracks to follow

The ecological and social deadlock experienced by West African fisheries should be urgently taken care of and the migration issue addressed. Regional co-operation in research project appears to an essential primary step stone for the definition of the migration dynamics and its rapid evolution in the context of resources depletion. Hence, research national institutes should cooperate and share data in order to precisely quantify the number of migrants, volumes of catches crossing borders and the proportion of foreign catches in the total “domestic” landings.

Further, rapid action should be undertaken by national decision-makers in order to limit the impact of fishing migration in ecologically sensitive areas, on already threatened species (i.e. sharks, rays, demersal fish, etc.) and on accidental catches (turtles, cetaceans, etc.). One of the solution is to strengthen regional cooperation in fisheries management through the empowerment of regional fisheries management bodies such as the Sub-Regional Commission for Fisheries –which does not enjoy any legal bindings towards national authorities in order to enforce its decisions.

Biodiversity conservation bodies have also a role to play with regards to the issue of fisheries migrations. Marine conservation projects currently benefit from substantial sources of funding originating from foundations, international organizations and bilateral donors’ funding. These projects most often deal with emblematic biodiversity and local communities within the limits of the defined MPA, while migrant fishers in the neighbourhood of these areas are potentially the primary threat to this emblematic biodiversity and the functioning of marine ecosystems in general. Hence, fisheries migrations should not only be addressed within fisheries management policies, and more generally national policies, but also as part of marine conservation strategies in regional biodiversity projects.

## Acknowledgements

This article presents some of the findings of a project entitled « Strengthening of regional capabilities for the management of West African fisheries » (RECARGAO) conducted by IUCN West Africa and the Sub-Regional Commission for Fisheries (SRCF) as part to the Regional Programme for Conservation of the Coastal and Marine Zone in West Africa (PRCM). The authors have also benefited from the support of the European programme of co-operation in international research ECOST (Ecosystems, Societies, Consilience, Precautionary principle: development of an assessment method of the societal cost for best fishing practices and efficient public policies). The present article does not reflect the views of IUCN or the European Commission but only those of the authors.

The map of migrations presented in this article was prepared by Vincent Turmine from CEMARE, University of Portsmouth, Portsmouth, UK.



## References

Aburto, J., Thiel, M., Stotz, W., 2009. Allocation of effort in artisanal fisheries: The importance of migration and temporary fishing camps. *Ocean & Coastal Management* 52(12): 646-654.

Bakhayokho, M., Kébé, M., 1991. Réactions des pêcheurs face aux variations d'abondance et de disponibilité des ressources: approche méthodologique, in : Durand, J.R., Lemalle, J., Weber, J., (eds) *La Recherche Face à la Pêche Artisanale*, Symposium International, France, Paris, ORSTOM, 1991, t. II : 943-955.

Binet, J., 1973. Les populations côtières d'Afrique de l'Ouest. *Ethnologie Régionale* I.

Binet, T., Failler, P., 2011. Rapport préliminaire, Quantification des phénomènes migratoires des pêcheurs artisans en Afrique de l'Ouest, rapport UICN, Dakar, Sénégal, (forthcoming).

Bremner, J., Perez, J., 2002. A case study of human migration and the sea cucumber crisis in the Galapagos islands, *AMBIO: A Journal of the Human Environment*: Vol. 31, No. 4, pp. 306-310

Cassels, S., 2006. When are Migrants "Good" or "Bad" for the Environment? Panel Contribution to the PERN Cyberseminar on Rural Household Micro-Demographics, Livelihoods, and the Environment, April 2006.

Chauveau, J.P., 1983. Bibliographie historique du littoral sénégalais et de la pêche maritime (milieu du XV<sup>ème</sup>-début du XX<sup>ème</sup> siècle), Thiaroye, CRODT/ISRA, « document scientifique » 92, pp. 72.

Chauveau, J.P., 1991. Géographie historique des migrations de pêche dans la zone COPACE (fin XIX<sup>ème</sup> siècle – années 1980), in : Haakonsen, J.M., Diaw, C., (eds), *Migrations des Pêcheurs en Afrique de l'Ouest*. DIPA, Cotonou, FAO, DANIDA, Norway, pp.13-39.

Chauveau, J.P., 1986. Une histoire maritime africaine est-elle possible? *Historiographie et histoire de la navigation et de la pêche africaine à la Côte Occidentale depuis le 15<sup>e</sup> siècle*. Cahiers d'Etudes Africaines, (101/102) : 173- 236, 1986.

Chauveau, J.P., Jul-Larsen, E., Chaboud, C., 2000. Les Pêches Piroguières en Afrique de l'Ouest: Pouvoirs, Mobilités, Marchés, CMI - IRD – Karthala.

Cormier-Salem, M.C., 1995. Paysans-pêcheurs du terroir et marins-pêcheurs du parcours. Les géographes et l'espace aquatique. *L'Espace Géographique*(1): 46-59.

Cormier-Salem, M.C., 2000. Appropriation des ressources, enjeu foncier et espace halieutique sur le littoral ouest-africain, in : Chauveau, J.P., Jul-Larsen, E., Chaboud, C., 2000. *Les Pêches Piroguières en Afrique de l'Ouest: Pouvoirs, Mobilités, Marchés*, CMI - IRD – Karthala, pp. 205-229.

Dahou, K., Deme, M., 2002. Accords de Pêche UE-Sénégal et Commerce International: respect des réglementations internationales, gestion durable des ressources et sécurité alimentaire. Dakar: Enda.

Dahou, T., 2008. L'"itinérance" des Sereer Niominka. De l'international au local?», in Diop Momar-Coumba (ed.), *Le Sénégal des migrations*, Paris, Karthala ONU habitat et Crepos, p. 321-342.

- Failler, P., Gascuel, D., 2008. Over-exploitation in West Africa's richest zones, African report, no. 12, Aug-Sept issue, p. 28.
- Failler, P., van de Walle, G., Deme, M., Diop, A., Balbé, D., Dia, A.D., Bakalakiba, A., 2009. Les aires protégées estuariennes, côtières et marines (APECM) en Afrique de l'Ouest : des réservoirs de ressources aquatiques en sursis, Revue Africaine des Affaires Maritimes et des Transports, Juillet 2009, N°1, pp. 43-50.
- Gravel, A., 1908. Les pêcheries des côtes du Sénégal et des rivières du sud, paris, Challamel.
- Haakonsen, J. M., 1991. The Role of migrating fishermen in West Africa: what we know and what we still need to learn, in : Durand, J.R., Lemalle, J., Weber, J., (eds) La Recherche Face à la Pêche Artisanale, Symposium International, France, Paris, ORSTOM, 1991, t. II, pp. 709-715.
- Haakonsen, J.M., Diaw, C., 1991. Migrations des Pêcheurs en Afrique de l'Ouest. DIPA, Cotonou, FAO, DANIDA, Norway, 1991, p. 344.
- Jorion, P., 1988. Going out or staying home: seasonal movements and migration strategies among Xwla and Anlo-Ewe fishermen. Maritime Anthropological Studies 1(2): 129-155.
- Kébé, M., 1993. Principales Mutations de la Pêche Maritime Sénégalaise, in : Barry-Gérard, M., Diouf, T., Fonteneau, A., (eds), L'évaluation des Ressources Exploitable par la Pêche Artisanale Sénégalaise. Dakar, ORSTOM. pp. 43-58.
- Kramer, R.A., Simanjuntak, S.M.H., Liese, C. 2002. Migration and fishing in Indonesian coastal villages. AMBIO: A Journal of the Human Environment: Vol. 31, No. 4, pp. 367-372, 2002
- Laloë, F., 2007. Modelling sustainability: from applied to involved modeling, Social Science Information 46(1): 87-107.
- Nguyen Van Chi – Bonnardel, R., 1980. L'essor de l'économie de pêche artisanale et ses conséquences sur le littoral sénégalais. Cahiers d'études africaines. Vol. 20 N°79. . pp. 255-304.
- Njock, J.C., L. Westlund, L., 2010. Migration, resource management and global change: Experiences from fishing communities in West and Central Africa. Marine Policy 34(4): 752-760.
- Odotei, I., 1991. Migrations des pêcheurs Fante, in : Haakonsen, J.M., Diaw, C., (eds), Migrations des Pêcheurs en Afrique de l'Ouest. DIPA, Cotonou, FAO, DANIDA, Norway, pp.182-194.
- OECD, 2008. Fishing for Coherence in West Africa: Policy Coherence in the Fisheries Sector in Seven West African Countries. OECD, Paris, France, 11 march 2008, p. 123.
- Overa, R., 2000. Institutions, mobility and resilience in the Fante migratory fisheries of West Africa. Population, Consumption and Environment Initiative (PCE) Programme on Global Security and Sustainability, The MacArthur Foundation. Bergen, Norway, Chr. Michelsen Institute: 38.
- Randall, S., 2005. Review of literature on fishing migration in West Africa - from a demographic perspective. Sustainable Fisheries Livelihoods Programme, FAO and DFID, p.40.
- Sall, A., 2007. Loss of Bio-Diversity: Representation and Valuation Processes of Fishing Communities." Social Science Information 46(1): 153-187.

Sall, A., P. Morand, P., 2008. Pêche artisanale et émigration des jeunes africains par voie piroguière. *Politique Africaine* 109.

Suhrke, A., 1992. Environmental degradation, migration and conflict. Paper presented at the Brookings Institutions, Washington, D.C., May 1992.

Tricart, J., 1993. À propos des changements de climat récents en Afrique de l'Ouest. *Journal des africanistes*, tome 63 fascicule 1. pp. 73-81.

Warner, K., 2010. Global environmental change and migration: Governance challenges. *Global Environmental Change* 20(3): 402-413.

**[Table 2: Details of main Senegalese fishers' migrations and evolution over the period 1988-2008 ]**