

**FISH RESOURCES DEPLETION AND FISH ACCESS CONSTRAINTS:
FISHING COMMUNITIES'S PERCEPTIONS AND REACTIONS IN WEST AFRICA
The Senegalese case study**

by

Aliou SALL, Fishery socio-anthropologist, senior researcher
Phone : +221 556 91 83 E-mail : badousall2005@yahoo.fr

Contractor Ecost- Isra / Crodt Project

and

Moustapha DEME, Fishery economist
Phone : +221 632 50 27 E-mail : moustapha.deme@gmail.com

**Centre de Recherches Océanographiques de Dakar-Thiaroye
B.P. 2241, CRODT, Senegal**

August, 2006

1. Context of Senegalese fisheries: brief reminder for the purpose of this paper

Fishery is a multipurpose activity strongly deep rooted in Senegalese society. Too, it's integrated both in Senegalese economy. Through years, given its dynamism, the small scale fisheries have integrated smoothly the international markets. The importance and higher roles played by the small scale fisheries can be appreciated with ease at the following levels. First of all, it plays a strategic role in ensuring durable growth of the national economy by contributing notably to reduction of balance of payments deficit and unemployment and by enhancing State budget. Secondly, given the important place of fish in the Senegalese population's culinary tradition, fish and sea food contribute to the satisfaction of the necessary animal protein needs, both for urban and rural areas. Thus, it's one of the major components of the government's food security policy as it contributes largely to the satisfaction of the populations' proteins needs.

Despite this importance, the sustainability of the sector is questioned. The resources wealth is being harmed since couple of years with combination of the three following factors. First of all, we assist to an increasing of fish demand from foreign markets in particular for noble species. Secondly, the devaluation of the local money from the earlier 90's engendered an increasing fishing effort on demersal species; the incitative macro monetary policy induced some fishermen's movement from pelagic to ground fish fisheries, given the price offered by the international markets. It won't be useless to remind that most of the foreign market oriented "filières" in the Senegalese small scale fisheries are dynamised by international markets with the cephalopod and shark fisheries that are the best illustrations. Finally, the hard conditions and rural zones combined to the mechanisation by the introduction of out board motors participated to the increasing of fishers. In addition to the mechanisation, the increasing of the fishing population was supported and facilitated by the introduction of new technologies leading to new fishing techniques that require more muscular force (purse seiners for example) than traditional fishing knowledge; compared to others fishing practices, such as hook and line. The combination of all these factors can't ensure the sustainability of resources. For example, given figures from Crodt investigations, coastal high value demersal stocks, targeted by fishermen for foreign markets have got their status worsen: from fully to over-exploited. Beside, demersal stocks, the profitability of fishing units targeting costal pelagic species – such as sardinella – is more and more questioned; despite the good wealth of these stocks given scientists statements on this particular potential.

The materials used for the elaboration of this short paper are as following (see references):

a - The working paper – not yet published - coming from an informal exercise undertaken by Aliou SALL on behalf CREDETIP (a Senegalese Ngo) in 2005. This exercise initiated jointly with this Ngo and a couple of fishing villages of Guet N'dar, M'Bour and Yoff consisted – within participatory approach – in capitalising the local knowledge fishing communities amassed through their trajectory concerning; part of these outcomes are valued for the purpose of this paper;

b – Primary data that are the outcomes of investigations, interviews in the framework of CRODT, undertaken by Moustapha DEME;

c – Part of the basic information collected by Aliou SALL within the field work undertaken for the preparation of the paper on “values” to be published in SAGE.

The first point (section 2 as below) of this paper will treat the main reasons to build up community based indicators for resources depletion assessment. The section will relate to how both stakeholders and communities in a broader sense value this process. The third will focus on perspectives for better dialogue between fishing communities and research towards efficient fisheries management. The paper will not integrate aspects relating to “values” attributed to marine entity by fishing communities and questions related to the cultural dimension of “fishing” as a way of life – as scheduled – before IFFET meeting for the following reasons. First, e-poster presented in last IFFET meeting emphasized on issues related to fish stock depletion. Secondly, an article on the specific issue of “values” is already in the process for publication through SAGE- SSI, under Serge Collet’s supervision.

2. Deficit of dialogue between scientists and stakeholders, lack of trust in the way of conducting research and its utility: A need for communities based fish stocks depletion assessment.

Fishing communities generally speaking – and stakeholders in particular – build up their own way to assess fish stocks depletion. There are reasons behind their will to build up their own valuation method such as: **a** – The complexity of the demarche undertaken by conventional research centres; **b** – The difficulties faced by scientists to give answers – on time – stakeholders’ concerns concerning either the changes in species size, the seasonality, etc...and **c** – the important gap between scientists’ statements and the reality on the field.

Based on that, stakeholders – through the valuation of their rich exposure and experience – have construct gradually self made method for fish stocks degradation. In addition to the main reasons – as mentioned above – for those qualitative indicators, a couple of additional factors justify this from stakeholders’ point of view such as: **a** – The fact that these community based loose of bio – diversity valuation indicators are understandable world wide speaking whatever is the level of education of who’s using them: highly educated scientists, grass root stakeholders and even people other coming from outside fishery such as people whose unique linkage with the sea is the use to consume fish and / or sea food.; **b** – The valuation processes and the construction of the required methodology don’t induce financial costs , compared to the higher transactions costs engendered by conventional research approach and **c** – despite the informal

and qualitative sides of such indicators compared to methods used by highly educated scientists with this well known “ quantitative methods culture”, the indicators used by fishing communities and stakeholders are tools that enable them to overcome a certain “confession of powerlessness” they used to adopt while sharing and talking with scientists. In fact, by using their own approach – based largely on their social capital: ethno/ scientific knowledge – they feel armed enough by using tools they master; the well founding of their arguments can’t be questioned by any scientists, whatever is the level of education and skinless of this later; **d** – the will to establish their own indicators contribute to a better visibility of those communities. In fact, despite the important literature regarding the role and the place of small scale fisheries at social and economic levels in countries having fishing tradition, fishing communities haven’t yet recovered enough the power they have in principle. Too, the social status they should have is not yet attributed. It’s amazing to realise that- despite the contribution of this sector to the national economy: more than 70% of per year landings, more than 60% of contribution to the total volume exported per year – fish workers are used to be considered “jobless” when having a look on their identity card.

3. Fish stocks depletion and fish access constraints: Stakeholders’ perceptions and reactions

In this section, it will be quite difficult to have two separate sub- paragraphs talking respectively about perceptions and reactions. This is related to the main reason as followed: the stakeholders’ reactions are at the same time part of signals and /or behaviours, used as qualitative indicators for assessing the wealth of fish stocks. These signals represent in many cases the reactions in terms of strategies adopted and developed in order to contain the fisheries resources degradation.

The first actors to be concerned by this process and thus, who felt the need the assess and react (to) it are the stakeholders involved directly on harvesting activities (fisher) and other related activities such as processing (processors whose main part are women) and markets (fish mongers among whom a huge number of women involved in micro –fish marketing). In addition these activities, stakeholders apply these qualitative indicators on fishing community itself – globally speaking –and even on the broader Senegalese population; which approach – as we’ll see later – is relevant in a country where “ consuming fish is part of the culinary tradition”.

3.1. Harvesters

For this group, the most important indicators of fish stocks degradation – with the negative impact on the bio – diversity wealth – are expressed at the following levels:

The important changes in the catches structures within years. To illustrate these phenomena they used to refer to two main “filières” such as the demersal fish and the shark fisheries. Concerning the first one, filières that were supposed to be formally specialised (one specie) for foreign markets have become gradually multi – species fisheries. In this context, fishermen that formally targeted sea - bream combine it with other types of fish both for local and international markets. This trend is deeply supported by the attitude and capacity of fishermen to develop strategy of polyvalence – use of mixed gears – based on a rich social capital.

The increase in fishing effort is another indicator of the bad wealth of resources. The length of purse seine - considered a non selective gear – has been increased; they're from 300 to 1000 meters long.

The quantities of juvenile are getting more and more important in catches whatever is the species, either demersal or pelagic.

By catches that used formally to be composed of very low value species are becoming gradually the main sources of incomes for many fishermen, in particular for gill nets, beach seines and purse seine users. It's the case of numerous fishermen for whom sharks and rays that supposed to be by- catch, have become their main sources of incomes.

Fishermen's attitude to offend the fishing law by using prohibited gear is a signal, strong enough, to appreciate the pressure induce by the access constraints.

The profitability of fishing operations is gradually questioned with the increasing of fishing with the fuel costs that represent the most important part of the budget leading. This issue is a common concerned for all the fishermen whatever are the size and the type of the fishing unit that is used.

One of the social costs engendered by this crisis in fisheries is the higher level of risks taken by fishermen to access to resources. The best demonstration of this is the periodical arrestment of Senegalese fishermen entering illegally in the marine waters of Mauritania and Guinee Bissau. This kind of conflicts used to happen but the depletion of resources has led gradually the Senegalese too much dependant of these two countries' resources. They are permanently threatened to death and loses of fishing equipment as they are facing on a daily basis the firing of the Mauritanian navy. Senegalese fishermen are dealing with the same problems as well as in Guinea and Bissau Guinea. The gradual and higher dependency of Senegalese fishermen on marine resources under foreign states' jurisdiction has got a certain extension that impact negatively on our fishing legislation and policies. This is the stronger argument used by fishermen who till, don't accept the fee access for small scale fisheries; which is part of the component of the Senegalese new fisheries Code. Professionals stated that most of the big fish landed by box ice canoes are caught out of the Senegalese waters jurisdiction. From small scale fishermen's point of view– in particular those still targeting the demersal species – the increasing number of licences signed these past years with neighbour (Cap-Vert, Gambia, Guinea Bissau, Mauritania) has a double signification: the rarefaction of resources they're used to rely on in waters under Senegalese jurisdiction on one hand and a well founded reason to not pay access fees as demanded by the new Senegalese fisheries Code.

The wealthy conditions have got worsen, as the consequence of resources rarefaction. Fishermen working on board of the “*bateaux ramasseurs*”, owned generally by Koreans, operating at high seas for 45 days fishing trips. The working conditions are inhuman in those industrial fleet as far as accommodation, food, safety, are concerned. With the extension of the fishing tide – number of days spent at sea – and the reduction of resting time between two trips – their living conditions is quite harmed.

The minimal size of fish caught must be higher than the size for first sexual maturity. At this stage, the fish has a role to play for the eco- system: it contributes to the growth of the resource before being caught. The pelagic are concerned such as the “*sardinella aurita*”. This specie is consumed locally in Senegal, and at the level of the sub-region. It's too caught to supply fish plants for fish oil or fish meals productions.

In addition to all these harvesters' reaction to face access constraints through fishing effort increasing, these later have developed other strategies such as: **a** – The reduction of the financial capital – a de capitalisation process - by investing on smaller fishing units (case of purse seine smaller crafts and only one instead of two) ; **b** – The limitation of fuel consumption whatever is the result of the fishing trip; fuel consumption is organised, based on access constraints. The available volume of fuel is divided into two parts: one for the fish trip and once consumed, the second is used to come back whatever in the catch. **c** – In order to face the increasing cost of fuel and its impact on the fishing unit budget heading, the fishermen have adopted a couple of decisions and strategies. First, the crafts are getting more and more autonomous at sea given the extension of fish ground operations. The wooden made ice boxes, used exclusively on board of ice box pirogue is gradually adapted in other types of fishing units such as sharks fishing crafts. It is not useless to remind that the ice box canoe was the first type of craft supplying fish plants, operating far from the coastal lines with almost 7 up to 10 days trip. In other terms, the long “fishing” tide are replacing the former and shorter ones, being at the same time applied and gradually generalised on other species, in addition of the highly value species for which it was introduced more or less 15 years ago; secondly, most of fishing unit owners doesn't accept any longer to take in charge crew members: lodging and feeding the crew even in bad fishing seasons .**d** - An intensive fishing effort report from traditionally targeted species to high value species such cephalopods for a certain period and finally ;**e**– As briefly mentioned earlier, the fishing calendar no longer enable to fishermen enough time to rest; the dead annual season is gradually replaced by a full annual fishing season; this is supported by polyvalent fishing practices;

As a consequence of the combination of three factors – the rarefaction of resources, the increasing of assets costs in a sector where everything is imported beside manpower – the local solidarity net works (even at village level) are affected. The community based safety at sea informal network has got gradually broken off. The crisis faced by certain member's non longer enable them to respect the principles of reciprocal solidarity. Many associations are affected by the hard socio- economic- conditions in fishing villages. The functioning of these networks are quite harmed by loose of income induced by the non profitability of the large number of fishing units.

3.2. Fish traders

Fish traders used to be distinguished into three groups: one for locations, another one for rural zones and the third one for foreign markets. There is another group composed of women that market fish at very micro- level, with small quantities. This way to categorise fishmongers have been questioned by the rarefaction of products. Formally each of these groups used to be specialised in one circuit (either urban markets, or rural zone, or international markets) and on one or two products. As a result of the resources depletion we notice the new trends and behaviours as below:

We assist to a certain mixing up between local and foreign markets whenever the opportunity is offered. In fact, part of fish traders who were formally specialised in foreign markets, are mixing up “European products” and “African products”. These later – among whom some have been supplying foreign markets for couple of years – are gradually concentrating their efforts on local markets, moving from high value species to species consumed locally such as coastal pelagic.

Concerning women involved traditionally in micro level fish marketing, the mutation is quite very strong. On one hand, they no longer rely on fresh fish marketing. Depending on availability, they can be invested periodically in the processing sector when pelagic landings are very important and prices very low. On the other hand, women in fishing communities are diversifying incomes through activities such as: second hand cloth, shoes or cosmetic items in landing areas. The resources rarefaction impacts differently on women, who are traditionally the main actors of micro level fish marketing and artisanal fish processing sectors. In location like Joal, M’Bour and the Casamance region, they’re facing a strong competition for access to raw material with economic operators like Ghanaian and Burkina. These two groups involved in the processing of sharks, rays and sardinella have set up well organised structures and networks in order to ensure a permanent access to fish. The rarefaction fish stocks depletion has induced conflicts between local women – formally involved in micro level fish market and processing – on one hand and other operators from Ecowas countries such as Ghanaians and Burkina be.

Fish traders, traditionally specialised in supplying foreign markets use a couple of signals and events to appreciate the resources crisis. Most of the fish plants are in bankruptcy because of the constraints they’re facing in their attempts to ensure a permanent fish supplying. The industry is threatened by difficult access to raw materials in a context of resource overexploitation.

Fish stocks rarefaction impacts strongly on formal contracts and informally institutionalised arrangements between plants owners on one hand and fish suppliers on the other hand (fish mongers). We assist to the breaking of long term contract between fishmongers and fish plants owners. Former fish supplying exclusive rights given to certain fish mongers by plants owner are gradually replaced by short term contracts. This is not automatically linked to the confidence relationships breaking off; it's rather related to the increasing of "hazard moral" fish plants owner are facing in their will to access in a regular base to raw material. This is a serious constraint in a context of an international fish market where "supplying foreign markets on a regular base is the main condition to maintain customers, based abroad". In this new situation, the relationships between suppliers and fish plants owners have evolving from deep relationships – including in some cases extra professional relations with reciprocal solidarity – to anonymous relationships.

3.3. Fish women processors

The processing sector is affected by the resources bad wealth. The main indicators raised by women involved in this specific activity are as follow:

The important and the increasing part of waste and altered products (rejected by fish plants for international hygienic and quality norms) in the structure of the whole volume processed: salted and dried or smoked. In many processing areas – in particular the sites of Thierry that is one of the most dynamic processing areas – women are depending daily speaking and largely on wastes coming from the industrial fisheries harbour: disqualified products by exporters for norms reasons or remaining from fish plants specialised in filet. This situation is seriously impacting on the working and social conditions of women involved. The hygienic conditions in these sites have got worsen, causing public health problems. In addition, the supplying of processing sites from wastes has led to the air pollution inside the sites themselves and the neighbourhood.

As mentioned earlier, with regards to the rarefaction of resources, we assist to the following process "a gradual feminisation of poverty in small scale fisheries". In fact, the presence of new operators – composed mainly of men – in the processing sector has led to competition between these later and the women. For example, in La Petite Côte, traders from Golf of Benin states have gradually integrated the fisheries. If at the beginning they were supplies through middle women, nowadays, they have succeeded in controlling part of the "filière" through the following strategy: investment in the phase of harvesting, access to land for habitat and / or production units establishment, etc... This induced a certain loose of social power that women

used to have and preserve; whose power has been built up and preserve by their main and predominant role as the one to have in charge - traditionally - the marketing of the family fishing units. The loose of this social power – that has a certain consequence on their social status – in the result of the combination of certain factors: important mutations in the ownership structure, impacts of macro economic policies, etc.

There is apparently a mimetism between women involved in micro level fish marketing and those in the processing sector. In fact, we can notice two new behaviours and practices. First of all, the processors are becoming polyvalent mixing up several species; this depends on availability. Secondly, they can move from processing to micro level fresh fish marketing, depending on opportunities that are offered. Finally, we assist to their will to diversify their sources of incomes through small business such as: cloth and cosmetic items selling.

Beyond people involved directly and indirectly in the fisheries, the rarefaction of fish is felt and valued by the Senegalese population, generally speaking. In a country where fish is occupying an important place in culinary habits, the lack of fish is automatically felt by people. For people external to fishing communities, the two genuine indicators used to appreciate the fish access constraint are: **a-** The decreasing of both the quantity and the quality of fish consumed daily in a Senegalese household. **b-**The adoption of new species in local fish and sea food consumption, considered a few years ago as non proper for human consumption. This is the case of: fresh octopus, ballista and salted dried sharks and rays for certain communities.

4. Perspectives for a better management towards sustainable fisheries at social, environmental and economic levels

4.1. Breaking off the gap between scientists and stakeholders.

Contrary at what someone can imagine there is a gap between scientists and stakeholders. Despite efforts made in certain countries – where the political environment enables – in term of establishing linkages between the research centres on one hand and the communities, serious misunderstandings remain at the following levels:

First of all, there are still doubts on the utility of research. The well founding of conducting research is questioned with regards to reasons (from communities' point of view) by those who are supposed to concerned at first stage. This lack of confidence in scientists is more serious in fisheries compared to agriculture.

Secondly, the stage of knowledge regarding fisheries is generally over estimated. Scientists – may be forgetting that we are in the sector less controllable than agriculture or aquaculture – make statements and projections regarding fish stocks with high risks. The experience in Octopus is quite enough to confirm how difficult it is for marine biologists to master the situation.

And finally, the fishing communities are part of societies where Tradition and Religion are still two poles of expression of Power. These two poles contribute to political governance as far as the State is not the only form of expression of Power. This is the main reason behind the generalisation of use of prohibited and none eco –friendly fishing gears in Senegalese marine waters.

Given these specific realities proper to our societies, a real dialogue without convenience must take place between the research and fishing communities in order at a first stage to:

- Confront the conventional and ethno-scientific knowledge regarding the fisheries generally speaking and the resources in its dynamism in particular. Without “romantising” the fishing communities, we notice that the community based representation of marine entity impacts a lot on fishing practices.
- Appreciate without complex the real state of these two different “knowledge” in order to take in account the limits both side.
- Finally, evolving gradually from an approach giving priority to national and sub-regional for a to community approach.

4.2. Promoting transparency in fisheries Public management and governance.

In most of West African countries, a none informed observer may be astonished by a contradiction in fisheries management policies. In fact in countries like Senegal – for example – despite the eco friendly fisheries Code and Legislation, our fishermen are famous because of their use to offend Law. The case of drift net that is officially prohibited is used at the level of the coastal line. In addition to that, the State did ratify a couple of Legislations and Treaties consisting in promoting a better fisheries management (we can mention the COFI and the Jo’ Burg declaration) ; but it looks there are some “none expressed” constraints for the Public decisions makers to implement those instruments and tools. We assist to a multiplication of seminars, fora and colloquiums that participate to a delay of a deep, transparent and franc

debate towards concrete solutions. In this situation, the actors involved in fisheries management policies, including environmental NGOs have moral responsibilities and have to promote “more transparency” in fisheries governance by:

- Searching the main reasons behind the non implementation of fisheries Legislations and Laws;
- Stimulating coordination between State global fisheries policies on one hand and other international, continental and sub-regional treaties, policies and legislations.

4.3. Evolving from “Production oriented” policies to long term programmes in the benefit of fish and sea food better valuation.

The programmes implemented in the small scale fisheries are mainly oriented to production. Even the different initiatives that are undertaken to regulate access to resources do not question the production. The fisheries are nowadays in a situation of saturation: the increasing number of fishers, the different innovations applied to the pirogue have achieved certain limits, etc...

The priority should be to reverse the trend by:

- Setting up a transparent and efficient regulation access in the small scale fisheries;
- Reviewing the real well founding of Fisheries Licences Agreements by diversifying the sources of required resources for the functioning of fisheries administrations and related fisheries centres;
- Giving priority to “ how to give more value” by investing in processing units; the habit to rely the exportation of raw material is not efficient at environmental and economic level.

5. CONCLUSION

Due to the combination of factors - increasing of fishers’ number and of the fish demand at international level – the fish stocks depletion has become recognised even by stakeholders from self made qualitative indicators. Despite this recognition, they develop new strategies in order to ensure an access to resources. These new strategies are not at all sustainable given the social and economic costs engendered. In addition to that, the status of fish stocks can’t support any longer the fishing effort with regard to the huge number of fishermen.

The Public policies aiming to regulate access are not successful, giving the fact there are offenders. There is apparently a big gap between stakeholders on one hand and the decisions makers and the scientists on the other hands. The misunderstanding comes mainly from different ways of representing himself the resources. In this context a real dialogue must be promoted and supported between fishing communities, scientists and Public decisions makers. Too, the public fisheries administrations should evolve from”production” oriented approach to “better valuing fish products”.

BIBLIOGRAPHY

CREDETIP (Fisheries intermediate technologies research and development, Senegalese NGO)

Signals and qualitative indicators of fish stocks depletion and loose of bio –diversity from fishworker’s perspective and representations. Report: informal sharing with fishing communities. March, 2005, 13 pages.

SALL Aliou

Working paper 1 and working paper 2: Secondary data collected from surveys on the issue of “Fishing communities’ valuation processes of loose of bio –diversity” in the following fishing villages : Guet Ndar, Joal, Hann, M’ Bour, Yoff and Soumbedioune, from May to June 2006.

SALL Aliou

Shark fisheries description in Senegal: Expansion analyses and glossary of actors involved at harvesting, processing and marketing levels. PRCM – FIBA. August, 2005, 46 pages including tables and maps.