

CASE STUDY OF SMALL PELAGIC FISH RESOURCES IN NORTHWEST AFRICA (by Birane Samb)

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Note: Some sections of this paper contain summaries from the reports of the FAO working group on the assessment of small pelagic fish off Northwest Africa and the Workshop on the management of shared small pelagic fishery resources in Northwest Africa organized by FAO and the Nansen Programme.

Résumé:

Les eaux marines de la région nord ouest africaine sont très productives en raison d'un upwelling actif. Le secteur de la pêche joue un rôle prépondérant dans l'économie des différents pays. En dépit de leur faible valeur marchande, les poissons pélagiques côtiers sont les espèces dominantes dans les captures et constituent les ressources les plus abondantes et les mieux partagées. Leur exploitation concerne aussi bien le secteur industriel que le secteur artisanal.

Ces espèces font l'objet d'évaluations régulières et les mesures d'aménagement préconisées indiquent un suivi strict de l'effort dans les pêcheries de chinchards et de maquereaux. Un taux de capture à ne pas dépasser a été défini pour les sardinelles.

Les influences respectives de la pêche et des fluctuations de l'environnement sur l'abondance de ces stocks ne sont pas bien comprises. En effet, l'abondance des stocks pélagiques reste tributaire des conditions hydroclimatiques et ces stocks nécessitent par conséquent une gestion qui tienne compte de leur instabilité.

Les pays consentent actuellement un effort dans le sens de mieux régler la pêche. Mais faute de moyens et de coopération plus poussée, le respect des mesures édictées ne donne pas encore pleine satisfaction. Des initiatives récentes sont prises pour sensibiliser sur la nécessité d'un aménagement concerté de ces stocks partagés.

Abstract:

The marine waters off Northwest Africa are very productive because of the active upwelling that takes place at different intensities along the

coast and which supports important fish resources (among which the small pelagics are the most abundant). The fishery sector plays an important role in the economies of the different countries of the region. Despite their relatively low commercial value, the pelagic fish are dominating the catches and is important to both the industrial and artisanal sectors.

Several assessment studies of these resources have been carried out, and the management recommendations given calls for a control of effort in the mackerel and horse mackerel fisheries, whereas a catch level not to be exceeded has been defined for sardinella.

The pelagic stock abundance is highly sensitive to changes in hydro-climatic conditions; however the influence of fishing and environmental factors on the abundance of these stocks is not well understood and hence requires a management that takes this into account.

The countries of the region have agreed to put into place measures to better control their fisheries. However, due to a lack of funding and insufficient regional cooperation on this issue, the measures are not yet satisfactory. Recently, there have been some initiatives to promote better management of shared stocks.

INTRODUCTION

The coastal countries of the northern part of the Eastern-Central Atlantic region (from Morocco to Guinea, including the Cape Verde islands) constitute a geographical entity with a population of about 50 million inhabitants, most of whom live in the coastal area. The Exclusive Economic Zone (EEZ) of the region covers about 2 475 000 km².

The waters of the sub-region can be divided into three zones: the northern zone comprising Morocco, Mauritania, Senegal and the Gambia that is characterized by a well-defined upwelling rich in nutrients; the Guinea-Bissau to Guinea zone that is influenced by numerous estuarine contributions; and the island zone of Cape Verde with a reduced continental shelf and very little upwelling.

The existence of favourable hydrological conditions, notably the Canary and Guinea currents, allow the development of a rich marine fauna that are exploited by national vessels as well as by vessels from outside the region.

This document describes some of the pelagic resources, the respective fisheries and some of the management measures that are in place in the northern zone mentioned above. It also describes recent initiatives concerning management of shared stocks, and attempts to present a perspective of how a concerted effort can be made for the management of the coastal pelagic stocks in this area.

BACKGROUND

For most of the countries in Northwest Africa, fish is the only source of animal protein for the majority of the population. The fish consumption of about 20 kg/year/inhabitant surpasses the average for the rest of Africa, which is 8.2 kg/year/inhabitant.

The fishery sector employs thousands of people, and contributes on average to more than 4.3 percent of the GDP of these countries. In Mauritania the fishery sector contributes to about 12 percent of the GDP. The sector also contributes to the countries' earnings through the various fishing arrangements, agreements and licenses. The fishing agreements provide the states with financial compensations and other support measures, such as institutional support and training of nationals. However, it can be noted that the basic principle of these agreements, that is "to exploit the surplus production that the national fleets are not utilizing" does not relate well to the observed decline and even collapse of certain fish stocks and with the inaccuracy of the scientific data in some countries which were used to quantify these quotas (IUCN, 1999).

The important marine resources of the sub-region, notably the small pelagics that can constitute in weight close to 70 percent of the total landings of these countries were for many years exploited mainly by foreign vessels but with significant catches taken by the traditional Senegalese pirogue fishery. With the ratification of the Convention of the Law of the Sea and the extension of the EEZ to 200 miles, the possibility for the coastal states to exploit these resources increased. The coastal states quickly became aware that the revenue drawn from the exploitation could only last if the resources were rationally exploited. They also recognized that fisheries management is a complex problem that poses difficulties at different levels (conceptual, political, social and administrative) because of the various biological, technological, socio-economic, environmental and institutional aspects that must be considered and integrated simultaneously. Conscious of this problem, and in particular of the difficulty to reconcile the conservation of biodiversity, the respective environmental conventions and the exploitation of resources with the aim to improve the economic situation, the authorities of the different countries have tried to define national strategies for the management of the fishery resources and biodiversity. However it must be admitted that the measurements taken up to today regarding stock management have not prevented the decline of some stocks and the possible degradation of the ecosystems and problems of overcapacity, which continue to feed the polemics over the fishing agreements and which is a cause of concern for the fishery sector as a whole.

The aim of this case study is to examine the possibilities for the setting up of a concerted effort at the sub-regional level to ensure the effective cooperative management of the shared small pelagic resources. While

a cooperative management system is currently not in place for the sustainable exploitation of shared stocks in this sub-region there is increasing cooperation in the region in various management related functions including stock assessment, monitoring, control and surveillance and access agreements with third countries.

DESCRIPTION OF RESOURCES

The small pelagic fishes constitute the bulk (tonnage) of all fish landings and are the most important marine resources in the waters of the coastal countries within the study area (SAMB, B and B. C. Dioh, 1996). Due to their migratory nature, the small pelagics are shared by all these countries. Annual averages of several years indicate that the small pelagics can reach 70 percent of the declared catches.

The small pelagic resources comprise the following families: clupeidae, carangidae, engraulidae and scombridae.

The Clupeidae consists mainly of the sardinellas (*Sardinella aurita* and *Sardinella maderensis*) and the sardine (*Sardina pilchardus*) that are found in abundance in West Africa. *Sardinella aurita* (round sardinella) is concentrated in areas of cold water whereas *Sardinella maderensis* (flat sardinella) prefers lower salinity areas, often close to the river mouth. Two other species worth mentioning are the West African ilisha (*Ilisha africana*) and the bonga shad (*Ethmalosa fimbriata*) that live in estuaries and coastal zones

Two of the most important species belonging to the group Carangidae are *Trachurus trachurus* and *Trachurus trecae* that live mainly between 25 °S and 19° N. Species of *Trachurus* form very dense schools that can be fished using a trawl with a big vertical opening down to 200 meters depth. The false scad (*Caranx rhonchus*) is distributed from Guinea to Dahla as northern boundary with important catches between April to July.

The group Engraulidae is represented by different species of which the most common is the anchovy (*Engraulis encrasicolus*).

The chub mackerel (*Scomber japonicus*), which belong to the family Scombridae, is found along the entire West African coast.

Some of the secondary species caught in the coastal pelagic fisheries include: the Bigeye grunt (*Brachydeuterus auritus*), the Atlantic bumper (*Chloroscombrus chrysurus*), and the hairtails (*Trichiurus lepturus*). The sompat grunt (*Pomadasys jubelini*) shows strong abundance especially in the transition season and remains a target for fisheries.

DESCRIPTION OF FISHERIES

The artisanal and industrial fisheries exploit the small pelagic resources. The artisanal fishing is carried with motorized and non motorized canoes using different types of fishing gears. The industrial fishing involves the use of trawlers and purse seiners. Some of these are foreign vessels operating through fishing agreements.

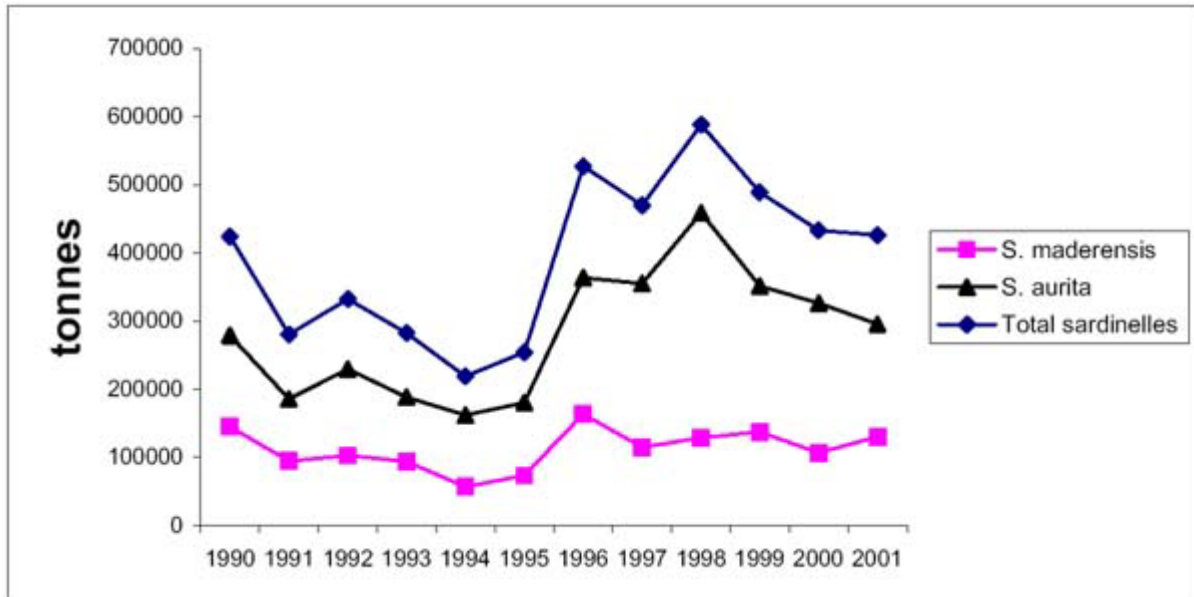
Among the exploited pelagic stocks, the sardinellas and horse mackerel are shared by Morocco, Mauritania, Senegal and Gambia. The presence of the sardine is especially localized in Morocco and in Mauritania. Therefore only the sardinellas and horse mackerel will be studied within the scope of this document.

The reference documentation for this chapter include the reports of the FAO working group on the assessment of small pelagic fish off Northwest Africa (FAO, 2001; FAO 2002a), working documents prepared for the Workshop on the management of shared small pelagic fishery resources in Northwest Africa held in Banjul, the Gambia 30 April-3 May 2002 (FAO, 2002b; FAO, 2002c; FAO, 2002d; FAO, 2002e) and FAO Fisheries Report 636 (Caramelo *et al.*, 2001).

Sardinella

The two species of sardinella are generally caught together. The round sardinella is normally targeted by the different fisheries due to its higher commercial value and because of its higher abundance in this sub-region. Figure 1 presents the evolution of the total catches of sardinella in the whole zone between 1990 and 2001. From the figure it can be seen that the trends of the two species are fairly similar. The largest catch of round sardinella registered was in 1998 with nearly 450 000 tonnes caught. Since then there has been a steady decrease in the landings of this species whereas the catch of the flat sardinella show an increasing trend in the same period. The catches of *Sardinella aurita* and *Sardinella maderensis* in 2001 were about 300 000 tonnes and 130 000 tonnes respectively (FAO, 2002c).

Figure 1: Catches of sardinella in Northwest Africa (from FAO, 2002c, unpublished)



The fisheries

In Senegal sardinella is caught by both the artisanal and the industrial fishery. The largest landings are by the artisanal fishery, which is constantly developing. This is carried out in motorised canoes with diverse fishing gear such as purse-seine, gillnets and beach seine. The industrial fleet is made up of small purse seiners or small tonnage sardine boats "sardiniers Dakarais" and powerful foreign vessels. The number of "sardiniers Dakarais" has been in continual decline for a number of years. In 2001 and 2002, only five were still fishing. During the eighties and nineties, large tonnage purse seiners and Russian trawlers fished in the Senegalese EEZ. The purse seiners disappeared in 1994 and the pelagic trawlers in June 1999 with the stop of the fishery agreement [why have they disappeared?], hence today the Senegalese industrial fishery is made up entirely of "sardiniers Dakarais".

Sardinellas in Mauritania are caught mostly by pelagic vessels from the European Union and in particular from the Netherlands. In 1999 the number of EU vessels were 13 (FAO, 2001). The fleet grew by two large vessels in 2000 and in 2001 another vessel arrived resulting in a substantial increase in the fishing effort of this fleet.

In the area between Dakhla and Cape Blanc the fishery became important at the beginning of the nineties. It is mainly carried out by pelagic trawlers chartered by Moroccan professionals and those vessels operating under the fishing agreement between Morocco and the Russian Federation. During the last five years (1997-2001) the fleet has declined from 35 to 22 fishing vessels. The highest yields of sardinella by this fleet were between the months of July and October in the area between Cape Barbas (22°N) and Cape Blanc (19°40'N). During 2000 and 2001, only the chartered trawlers operated in this

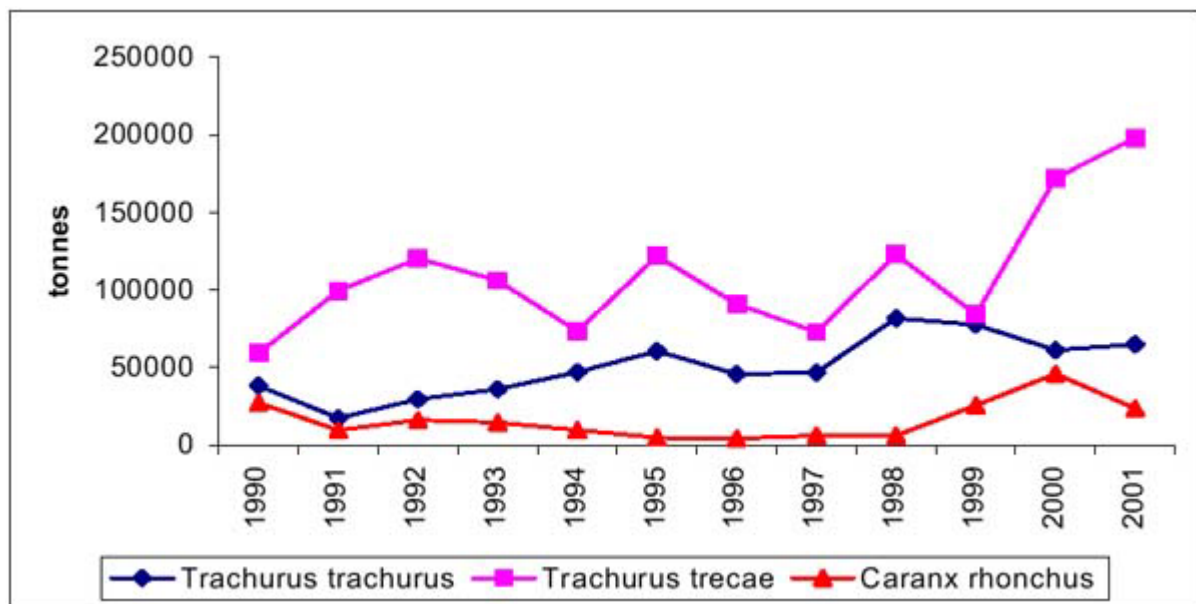
zone. The Russian fleet stopped fishing at the end of 1999 following the expiry of the fishing agreement.

In the Gambia, small pelagic fish, including sardinellas have not been targeted by the artisanal and industrial fleets since 1991. Consequently landings are very low.

Horse mackerel

The evolution of catches of the three species of horse mackerel between 1990 and 2001 is shown in figure 2. The total catches of these species in the sub-region were about 290 000 tonnes in 2001. The total catches seem stable over the time period, with some fluctuations. The Cunene horse mackerel (*Trachurus trecae*) is the most important species in the landings in this time period, with a catch in 2001 of close to 200 000 tonnes. The catches of this species fluctuate in most of the time period, showing an increasing trend from 1999-2001. The catches of the Atlantic horse mackerel (*Trachurus trachurus*) show a slight increasing trend up to 1998, followed by a decrease in recent year. The catches of *Caranx rhonchus* are fairly stable for most of the period, with an increase from 1998-2000.

Figure 2: Catches of horse mackerel off Northwest Africa 1990-2001 (from FAO, 2002d, unpublished)



The fisheries

In Mauritania, the fleets are composed of long range trawlers, which follow the concentrations of fish and process the catch (freezing, canning, fish-meal). These fleets are made up of vessels from Eastern Europe that have been in the zone for four decades, and more recently

of European Union vessels. The national industrial fleet is not very developed (FAO, 2002d).

In Senegal, horse mackerel does not constitute a significant part of the catch. Over the last few years the largest catches have been recorded by Russian vessels operating offshore (FAO, 2001).

In the Moroccan Northern zone, the Atlantic horse mackerel (*Trachurus trachurus*) is fished by a national fleet composed of purse seiners and coastal trawlers. The purse seiners target mainly sardine, whereas the trawlers target mainly cephalopods and demersal species (FAO, 2001).

In the area between Dakhla and Cape Blanc horse mackerel is exploited by the pelagic trawlers described above in the chapter on sardinella.

The European Union trawlers are from the Netherlands and Ireland and targets sardinella mainly.

Management recommendations

The second meeting of the FAO Working Group on the assessment of small pelagic fish off Northwest Africa that met in Banjul, The Gambia in April 2002 formulated the following management recommendations for sardinella and horse mackerel (from FAO, 2002a):

For the sardinellas, the working group recommends to maintain the level of catches at 500 000 tons for the two species combined in the total area. It should be noted that the total catches in the region is below the recommended 500 000 tons for the last three years, despite a substantial increase in fishing effort of the EU industrial fleet in Mauritania.

The annual catches of the different species of horse mackerel have fluctuated strongly over time, but all species show an increasing trend from 1990 to 2001. The CPUE data, calculated for vessels that targeted horse mackerel, show a declining trend. Moreover, the acoustic estimates of R/V Dr. Fridtjof Nansen show a decreasing trend for both species of *Trachurus*. This decline is partly compensated by the increase in biomass of false scad.

Considering the many uncertainties in the assessment of these stocks, a precautionary approach should be taken in management of the stocks. For this reason, the WG recommends a restriction of fishing effort to the current level.

PRESENT STATUS OF MANAGEMENT

At present the assessment of the small pelagic resources are made at the sub-regional level through the FAO Working Group on the

assessment of small pelagic fish off Northwest Africa. This excellent cooperation between scientists of the sub-region is the first stage for a concerted management of these resources.

Management measures are however adopted at the national level and one country's measures do not always correspond to management schemes applied in the neighbouring countries.

Management measures adopted by each of the member countries are summarized below.

Facing signs of over-exploitation of most fisheries resources of the Moroccan EEZ, management measures have been formulated and put into place. Below are the management measures applied: (i) freezing of fishing effort to the present level by an embargo on investments; (ii) control of foreign effort with respect to fishing agreements; (iii) restriction/banning of fishing within the 3, 6, 12 and 15 nautical miles contours depending on fishery; (iv) the setting up of a catch monitoring system by placing scientific observers onboard foreign vessels and the setting up of a Commission to control landing size of octopuses; (v) the strengthening of surveillance systems by the acquisition of planes and the possible utilization of satellites; and (vi) the introduction of a closed season in 1989 ("repos biologique") in certain fisheries, extended in 1992 to all fisheries.

In Mauritania, the management of fisheries is currently based on regulation of fishing effort, the delineation of fishing zones and closing of the fisheries (enacted every year). For example, in line with the recommendation of CEECAF, fishing effort has been reduced by 40 percent in the fishery of mackerels and horse mackerel. Fishery research has been intensified, particularly research on the small pelagics exploited by the artisanal fleet. Since the 1st of January 1995, access to resources by the artisanal fisheries is subjected to the remittance of symbolic royalties ("territorial right") by canoe and by year.

For the industrial fishery in Mauritania, the adopted management measures comprise the following: (i) the banning of imports of nets having a stretched mesh size of less than 70 mm; (ii) the revision of the fisheries legislation in conformity with the United Nations Convention on the Law of the Sea that entered into force November 16, 1994; (iii) the launching, since September 1994, of an international "call for sale" of licenses for the pelagic fishery; and (iv) for MCS, the creation of the "Delegation of the surveillance and control at sea" which is a civilian and autonomous entity, in replacement of the existing ministerial structure.

Gambia has adopted and put into place the following management measures: (i) delineation of fishing zones for artisanal and industrial fishing activities. Access to the area within 7 and 12 miles of the coast

is restricted for vessels above 250 GRT (ii) A MCS unit has been created and patrolling/policing is carried out by the Gambian Navy. Two patrol boats are being used, complemented by a plane provided under the Luxembourg development project (Project symbol)

In Senegal, the access to the fisheries has been limited by the means of a system that varies according to the resource being exploited. The global fishing effort now increases more slowly than in the past and a close monitoring of the artisanal fishing effort has been suggested. Access of industrial fishing vessels to the coastal zone exploited by canoes has been restricted. It has been recommended to limit the fishing effort to the level observed in 1992. A concerted approach for fisheries management, calling on contributions from research and professionals (industrial, fisher-artisans, etc.) has been formulated and its implementation is done through the advice of local and regional management "councils".^[57]

From the above review, it is clear that the management measures in place in the four countries are based mainly on zonation, minimum size with respect to certain species, mesh-size regulations, protection of certain species, licensing systems and the fisheries closures. In general, the legislations in force prohibit some types of fishing, forbids fishing for marine mammals and the use of explosives, poisonous substances and the use of electric discharges as a fishing method. The obligation to embark observers and to declare catches is a general measure in all countries. Surveillance projects working in close collaboration with a regional project based in the Gambia are in place.

The different legislations in place bear witness of the countries' commitment to the conservation and sustainable exploitation of their fisheries resources. However, it is at present appropriate to proceed to develop a mechanism for the concerted management of shared stocks.

NEED FOR COOPERATIVE MANAGEMENT

The countries of the sub-region aspire to a sustainable development in terms of creation of national wealth and social progress, conservation of the resources and the long-term sustainability of its exploitation. Recognizing that each country alone cannot solve the problems related to the management and sustainable development of the shared resources, the first initiatives to cooperation and coordination were started by some countries in the mid 1970's. The first meetings between the fisheries administrations in the region aimed at, among others, the harmonization of policies as regards fishing activities in the sub-region, the adoption of a common strategy towards international processes, the encouragement of the creation of common fisheries associations and the establishment of fishing agreements between certain countries of the region (SAMB, B. and H.O. EJIWEN, 1997). It was these concerted efforts that led to the creation of the Sub-Regional

Fisheries Commission (SRFC). Under the auspices of this Organization the member states have agreed on the following conventions:

- Convention for the determination of access conditions and exploitation of resources off the coasts of the Member States of the SRFC (1993)

This convention determines the access conditions applicable to all vessels operating in the ZEEs of the member countries. The application of the convention is at present only partial, but nevertheless constitutes an important element for the development of a common fishing policy for the sub-region. It also gives perspectives to operators so that they are submitted to the same legal rules in all member states.

- Convention on the sub-regional cooperation regarding the exercise of hot pursuit (1993)

This convention establishes principles of cooperation between "the state pursuing" and "the state sheltering" regarding the inspection of fishing vessels in infringement and establishes criteria for the distribution of expenses concurred during operations. The convention makes a distinction between vessels carrying the flag of SRFC Member States and vessels of other flag states.

- Protocol on the coordination of surveillance activities

The protocol foresees a certain number of cooperative activities in surveillance for the countries of the sub-region: Joint operations, exchange of information, improvement of communications, training etc.

Despite the cooperative effort described above, no agreement oriented specifically towards shared stocks exists as of today. It is only from 2001, that the possibility of establishing some sort of a joint management mechanism for the shared stocks has been explored by the countries of the sub-region. To this effect, workshops have been organized by various organizations encouraged by the WWF (Kees, L. *et al.*, 2002) and recently a Workshop organized by FAO and the Nansen Programme (FAO, 2002b).

The importance of collaboration to ensure sustainable management of shared stocks is a major topic in international fishery policy and the Law of the Sea. It constitutes the "raison d'être" for the 1995 United Nations Fish Stocks Agreement relating to highly migratory and straddling stocks. In the same way, the need for a shared authority is the fundamental principle of the Sub-Regional Fisheries Commission. Unfortunately, this principle is not currently reflected in the access agreements to the fishing zones of the region. In contrary, agreements are negotiated individually by the countries and the cumulative effects on the shared stocks are not taken adequately into account. One of the

important points to note here is perhaps the absence of regional cooperation as regards access control of foreign fleets.

OPTIONS FOR A COOPERATIVE MANAGEMENT REGIME

Issues related to the management of shared stocks were examined at a Workshop held in Banjul, The Gambia in April/May 2002. The Workshop was organized by FAO with the support of the Nansen Programme (FAO, 2002b). Scientists, administrators and lawyers working in the fisheries sector participated in this workshop.

Papers describing experiences from the North Sea were presented as well as documents analyzing the situation of fisheries and management organizations of the sub-region. The Workshop also proposed some options for the concerted management of the small pelagic fish stocks.

One of the background documents prepared for the above workshop (Owen, 2002) proposed, after an in-depth analysis, the following two options (from Owen, 2002):

The first is for the four States (Morocco, Mauritania, Gambia and Senegal) in question to form an arrangement among themselves. The justification for this would be that (a) it would allow focus on the unit of principal interest to the Fridtjof Nansen Programme for Northwest Africa and (b) it would allow negotiation between the four States from first principles. It need not be a treaty; on the contrary a MOU or joint statement among the States might be more appropriate.

Its chief disadvantage is that it would ignore the significant cooperation arrangements already in place. Further, it would potentially need to be integrated with any existing bilateral arrangements existing between any of the four States in question (e.g. the arrangements between The Gambia/Senegal, Mauritania/Senegal, Morocco/Senegal, and Morocco/Mauritania).

The second broad option would instead be to use any of the existing arrangements. However, use of such arrangements would require (as appropriate):

(a) accession to the African Atlantic Convention by The Gambia and Mauritania coupled with an amendment of the existing system of consultative mechanisms and introduction of a sub-regional approach; or

(b) a means of linking Morocco into the activities of the SRFC coupled with an amendment of the existing system of consultative mechanisms; or

(c) strengthening of the position of CECAF coupled with introduction of a sub-regional approach.

The Workshop participants did not favour the idea of creating a new organization, and noted the difficulties of determining a total TAC on an annual basis and its distribution/allocation among the countries. It was recognized that the examples given from the North Sea are the results of decades of cooperation and that the countries of Northwest Africa are in the process of capacity building. For reasons of simplicity and because the degree of complexity of management measures is likely to be progressive, it was felt that a new organization was not needed at the current time. Rather the country representatives participating in the high level management group should have the appropriate qualifications as well as the authority to endorse, or appropriately amend, the management options recommended by the scientific working group. A scientist and a representative of the fishing industry should also attend the management group as part of the country delegation. partnership with the Nansen Programme.

The following recommendations indicated in annexe were formulated to support in medium term the process of establishing a functional mechanism for cooperation later to be adopted (from FAO, 2002b).

CONCLUSIONS

The above presentation of the current situation of the exploitation and management of the coastal pelagic stocks off Northwest Africa reveals the need for co-operation in the management of these resources. Although a process has been initiated to establish a mechanism of cooperation in the region, at present no complete mechanism facilitating the countries' work towards joint management of the shared resources is in place.

Facing an increasing pressure on the resources, the coastal countries will have to commit themselves to develop an even more active co-operation than today. Taking as a starting point examples from existing arrangements and agreements on cooperation from other parts of the world, actions such as the establishment of a catch quota system for industrial fisheries and a control of effort for artisanal fisheries (number of units and/or number of trips) could constitute a first stage. However, it is important to note that it will be necessary to continue the support to the scientific co-operation already in place and to intensify the degree of collaboration of the fishery administrations.

REFERENCES

Caramelo, A.M, Lamboeuf, M and Tandstad, M. (eds.). 2001. Report of the Workshop to plan the 1999 R/V Dr. Fridtjof Nansen survey in the northern CECAF area and the standardization of acoustic surveys in the region. Casablanca. Morocco, 18-22 October 1999. FAO Fisheries Report. No. 636. Rome, FAO: 62p.

FAO. 2001. Report of the FAO Working Group on the assessment of small pelagic fish off Northwest Africa. Nouadhibou, Mauritania, 24-31 March 2001. FAO Fisheries Report. No. 657. Rome, FAO: 133p.

FAO, 2002a. Report of the FAO Working Group on the assessment of small pelagic fish off Northwest Africa. Banjul, The Gambia, 5-12 April 2002. FAO Fisheries Report. No. 686. Rome, FAO. 2002.

FAO, 2002b. Report of the Workshop on the management of shared small pelagic fishery resources in Northwest Africa. Banjul, the Gambia, 30 April-3 May 2002. FAO Fisheries Report No. 675. Rome, FAO: 35 p.

FAOa, 2002c. Case study: Sardinella in Northwest Africa. Working paper presented at the Workshop on the management of shared small pelagic fishery resources in Northwest Africa. Banjul, the Gambia, 30 April-3 May 2002: 13p (bi)

FAOb, 2002d. Case study: The horse mackerels in Northwest Africa. Working paper presented at the Workshop on the management of shared small pelagic fishery resources in Northwest Africa. Banjul, the Gambia, 30 April-3 May 2002: 13p (bi)

FAOc, 2002e. Small pelagic fisheries in the Northwest Africa. Workshop on the Management of Shared Small Pelagic Resources Banjul, the Gambia 30 April - 3 May 2002.

Kees, L., P.S. Diouf, P.S. K. Sané. 2002. Compte rendu de l'atelier: l'accès aux zones de pêche en Afrique de l'Ouest. 221p.

Owen, D. 2002. Legal and institutional aspects of management arrangements for shared stocks with reference to small pelagics in Northwest Africa. FAO Fisheries Report. *In press*.

SAMB, B et B. C. Dioh, 1996- Maîtrise Concertée de la Connaissance de la Valorisation et de la Gestion des Ressources dans les pays de la Commission Sous Régionale des Pêches (CSRП). Document technique de la CSRП.

SAMB, B. et M. H.O. EJIWEN, 1997. Document de compte rendu de la table ronde de la Commission Sous Régionale des Pêches. 18 au 20 Mars 1997 Praia Cap Vert.

UICN, 1999. La pêche en Afrique de l'Ouest: accords de pêche et perspectives. 35p.

ANNEX

Recommendations of the meeting Banjul, April 2002.

1. The work of the current FAO Working Group on the Assessment of Small Pelagics in Northwest Africa should be furthered and strengthened in order to maintain a high level of resource assessment studies in the coming years and the long-term future. Fisheries biologists should continue to exchange information, meet at least once a year to examine the state of the stocks and provide advice to fisheries administrations on management measures. Joint surveys should be conducted by scientists of the national research institutions in the region using national research vessels.
2. The FAO Working Group on the Assessment of Small Pelagics in Northwest Africa should consider inviting scientists from outside the region to participate in the Working Group.
3. Fisheries Scientific Institutions should identify research priorities and seek national budgetary allocations to sustain long-term research.
4. A precautionary approach towards the management of small pelagic stocks should be adopted to maintain a sustainable spawning stock. The basis for setting the total allowable catch (TAC) and fishing capacity for the next year should not exceed the average annual catch during the past five years in order to ensure a sustainable and rational exploitation of the small pelagics.
5. Countries should develop national management plans in support of a future joint regional management system.
6. An appropriate regional management system should be established around a scientific working group or committee and a management meeting proposing a scheme for a consultation mechanism between the coastal states sharing small pelagic stocks in North West Africa.
7. FAO should prepare the draft text of the proposed scheme and the next Steering Committee of the Nansen Programme should discuss the possibility of the Programme providing support to the countries concerned in holding a meeting to finalize and adopt the scheme as an international instrument.
8. Considering the need for active and competent personnel to effectively conduct the activities envisaged for sustainable management of small pelagics, it was suggested that a draft outline of a plan of accompanying measures, such as capacity building, be formulated by Mauritania on behalf of the participants in the FAO Working Group in collaboration with Norway and submitted to the next Steering Committee of the Nansen Programme.
9. While the scheme goes through the formal stages, it was recommended that participants sensitize their respective Governments on the need for funds to continue the activities which are currently

undertaken by the FAO Working Group on Assessment of Small Pelagic Stocks in Northwest Africa after the present funding ends.