



Policy Implementation and Fisheries Resource Management: Lessons from Senegal

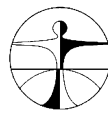


Fisheries and the Environment

Policy Implementation and Fisheries Resource Management: Lessons from Senegal



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Note

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The Senegalese study was presented and reviewed at an international meetings in March, 2002 convened by UNEP where it was the subject of numerous discussions between governments, international organizations, non-governmental organizations, experts and policy-makers, and subsequently revised.

At UNEP, the project was initiated by Hussein Abaza. The study was coordinated and revised by Anja von Moltke, assisted by Colin McKee. Susan Broomfield translated the original report from French and Désirée Leon provided administrative support.

United Nations Environment programme

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between environment and financial performance and the potential role of the financial services sector in promoting sustainable development.

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Preface

Fish is the primary source of protein for some 950 million people worldwide and represents an important part of the diet of many more. Fisheries are a source of employment for about 200 million people directly depending on ocean fishing for their livelihoods. In 2000, about 37 percent of the world fish production entered international trade with just over half of all fishery exports deriving from developing countries. For some of the latter, fishery exports represent a major source of foreign exchange earnings (FAO, 2002).¹

In recent years, after four decades of steadily expanding catches, there have been important declines in fish stocks, especially of the species favoured for human consumption such as cod, haddock and plaice. Whilst for the two decades following 1950 fisheries production increased by about 6 per cent per year, trebling from 18 to 56 million tonnes, the average rate of increase declined to 2 per cent between 1970 and 1980 and has fallen to almost zero in the 1990s (WT/CTE/W/167).²

Major ecological, economic and social damage is already evident. In particular, declining catches have resulted in a loss of more than 100,000 jobs in the last few years among the world's 15 to 21 million fishers, and the cost of fish in some local marketplaces has risen dramatically, placing fish out of reach for many low-income consumers (Weber, 1994).³

¹ FAO (2002), *The State of World Fisheries and Aquaculture (SOFIA)*, FAO Fisheries Department, Rome.

² WT/CTE/W/167 (2000), *Environmental Benefits of removing Trade Restrictions and Distortions: the Fisheries Sector*, Note by the Secretariat, WTO Committee on Trade and Environment, 16 October 2000.

³ Weber Peter, *Net Loss: Fish, Jobs and the Marine Environment*, World-watch; 1994.

Overfishing of the world's marine resources is the main cause of the decline of fisheries productivity. According to the Food and Agriculture organization (FAO), 50 per cent of all fishery resources are already fully utilized, 25 per cent are still potentially exploitable and the remaining 25 per cent are in severe danger of depletion and require major interventions to restore sustainable yields.

Widespread overfishing is generally recognized as a growing threat to the sustainable management of the world's fisheries. In major fishing states, investments in increased capacity (vessels, equipment and labour force) have brought fishing efforts to levels significantly exceeding the reproductive capacity of the fishing grounds. Excessive government support policies and especially subsidies to the fishing industry are suspected by many experts of having a direct causal relationship with recent trends in overfishing.

However, opinions still differ as to the relative importance of fishing subsidies as a factor affecting the stability of fish stocks. More work is required to address the linkages between fishing subsidies and the durability of fish stocks to guide progress towards a potential reform of fishery policies worldwide. Policy reforms should integrate environmental, social, economic, and trade objectives to ensure long-term sustainability of entire fishery ecosystems while minimizing any negative social and economic impacts on segments of the population relying on fishing for employment or food. In particular, more empirical studies at the country-level are needed to define and categorize current forms of government support and to assess their environmental, social and economic impact.

To help meet the need for additional study, UNEP supported this study on the implementation of a set of conservation measures to promote the sustainable management of the Senegalese fisheries sector. The project draws on the experience and lessons learned from a first UNEP Senegal Country Study on "Integrated Assessment of Trade Liberalization and Trade-Related Policies: A Country Study on Fisheries Sector in Senegal". With the endorsement of local fishermen,

industry representatives and government officials, the proposals being put forth in the present study to (i) restrict access through the establishment of fees, fishing zones and the involvement of local councils, and (ii) improve the enforcement of existing regulations indicate a strong commitment to achieving a sustainable management of fisheries. Furthermore, meeting these challenges at the local level is a first and important step towards achieving the goals set forth by government leaders at the World Summit on Sustainable Development to maintain or restore depleted stocks to levels capable of producing the maximum sustainable yield by 2015.

Abbreviations and Acronyms

ACP	Africa, Caribbean and Pacific countries
CEP	Cellule d'Etude et de Planification
CFAF	CFA franc, the basic monetary unit of UEMOA
CNPS	Collectif National des Pêcheurs du Sénégal
CREDETIP	Centre de Recherche pour le Développement des Technologies Intermédiaires de Pêche
CRODT	Centre de Recherches Océanographiques de Dakar Thiaroye
DCE	Direction du Commerce Extérieur
DE	Direction de l'Environnement
DID	Direction des Impôts et Domaines
DPCA	Direction de la Pêche Continentale et de l'Aquaculture
DPM (ex DOPM)	Direction de la Pêche Maritime
DPN	Direction des Parcs Nationaux
DPSP	Direction de la Protection et de la Surveillance des Pêches
EEZ	Exclusive Economic Zone
ENDA DIAPOL	NGO Enda Tiers Monde Prospectives et Dialogues Politiques
EU	European Union
FENAGIE	Fédération Nationale des GIE de Pêche
FENAMS	Fédération Nationale des Mareyeurs du Sénégal
GAIPES	Groupement des Armateurs et Industriels de la Pêche au Sénégal
GIE	Groupement d'Intérêt Economique
ICCAT	The International Commission for the Conservation of Atlantic Tunas
ICS	Industries Chimiques du Sénégal
ISE	Institut des Sciences de l'Environnement
ISRA	Institut Sénégalais de Recherches Agricoles
MEF	Ministère de l'Economie et des Finances
MP	Ministère de la Pêche
MPA	Marine Protected Area
NGO	Non governmental organization
OSP	organization Socio-Professionnelle
UEMOA	Union Economique et Monétaire de l'Afrique de l'Ouest
UNAGIEMS	Union Nationale des GIE de Mareyeurs du Sénégal
UNEP	United Nations Environment programmeme
WTO	World Trade Organization
WWF	Worldwide Fund for Nature

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Executive Summary

Fishing plays an important role in the Senegalese economy and society. Indeed, it is a multipurpose activity that contributes towards reducing the balance of payments deficit, reducing unemployment and satisfying the protein needs of the population.

Despite its importance, the fishing sector is facing serious socio-economic disequilibria, which has led to overfishing and the use of harmful methods of production. This, in turn, has resulted in the shortage of supplies to local markets and a reduction in protein intake for populations dependent on fishing. Furthermore, the strong tendency to export Senegalese piscatorial products has led to a shift in focus of the fishing effort from locally consumed species (pelagic) to export oriented ones (demersal), since the latter have a higher added value.

This situation has led to overfishing of the coastal demersal species and created tensions in relation to the prices of locally consumed species. In addition, overfishing induces impoverishment of a majority of the population since fishing constitutes one of the first sources of employment in Senegal.

This is the social and economic context in which UNEP intervened, in collaboration with Enda Diapol and the CRODT/USRA (Centre de Recherches Océanographiques de Dakar-Thiaroye) and the Ministry of Fisheries, to carry out a country study on “Integrated Assessment of Trade Liberalization and Trade-Related Policies: A Country Study on the Fisheries Sector in Senegal”, and to reconcile the need for external competitiveness with trade liberalization, the sustainable management of resources and the satisfaction of the dietary requirements of the Senegalese population. The results and recommendations of this study have been published and disseminated in the field among fisherman stakeholders.

The objective of this project is to formulate an action plan that would contribute to a better preservation and promotion of the Senegalese piscatorial resources. The two measures represented in the action plan of this project are a complimentary research on the regulation of resource access for small-scale fishing and the establishment of a “discussion forum” on fishing regulations.

Part I of this report explains the methodology that lies behind these two work themes. The approach is essentially based on the participation of the greatest possible number of actors in the consultations, and involved the organization of meetings not only during the preparatory phase but also during implementation and before the diffusion of the results.

Part II presents the research on the regulation of resource access for small-scale fishing. The research is carried out in different stages, including organizing debates and taking into account the general perception of stakeholders on the regulation of fishing and their proposals for a possible regulation of resource access. These proposals are mainly concerned with putting in place a system based on concessions for resource access rights, an appropriate framework for the management of concessions by its recipient, consideration of the actors concerned, the territorial boundaries of the concession and the payment of resource access rights. The proposals are also supplemented by other conditions and attendant measures recommended by the stakeholders. As far as proposals relative to the payment of resource access rights are concerned, the accent was placed on the criteria for determining the cost of resource access rights and the appropriate steps for ensuring that the system functions well.

Part III of the report presents the discussion forum on Senegalese fishing regulations. Representatives at these discussions reported on the non-application of the regulations, the use of unauthorized devices used in maritime waters under Senegalese jurisdiction, the minimum landing sizes and the fishing zones. The non-application of regulations relates especially to the use of banned devices (presented in this part) and the

capture of species at unauthorized sizes. Proposals for the revision of the regulation to make it more in keeping with a better preservation of piscatorial resources were also presented.

One of the principal objectives of this project was to achieve a greater involvement of stakeholders, locally elected persons, the local administration and the judiciary powers in the implementation of a system of concessions for resource access rights. In order to do this it was necessary to fix criteria pertaining to the profession of “fisherman” and to determine the amount and mode of payment of resource access rights for small-scale fishing. Other measures relative to the regulation of access to the resource for small-scale fishing boats were also revised.

However, before a concession system can be put in place it will be necessary to solve the current crises in the Senegalese fishing sector in order to fight against the degradation of the marine space caused by industrial fishing and factories.

The recommendations set out for improvements in the application of the regulation of fishing in Senegal concern small-scale fishing as much as they do industrial fishing. The recommendations made in relation to small-scale fishing are aimed at making sanctions against offenders more coercive. More exemplary sanctions need be applied to this effect. Furthermore, activities relating to training and sensitization are strongly recommended by the discussion forum to render the bans already included in the regulation regarding certain fishing devices more operational. In addition, commercial measures are recommended in order to ban the sale and use of monofilament nets and to extend this regulation throughout the sub-region.

For industrial fishing, the main recommendation involves placing an observer at the disposal of each vessel and ensuring these observers are autonomous and independent vis-à-vis the vessel. The discussion forum also recommended extending the coastal area forbidden to trawlers.

As far as the minimum landing sizes are concerned, a scrupulous adjustment of the regulation is recommended to bring it in line with the reports set out by the research missions. It is also hoped that the new regulation regarding small-scale fishing will gradually lead to a reduction in the quotas established in the fishing agreements.

Introduction

In Senegal, fishing is an activity that is highly integrated into the rest of the economy and society, and even more so since the droughts and agricultural crises of the 1970s. In addition, fish has become an important source of protein for the Senegalese population due to the decline in other sources of vegetable and animal proteins. The Senegalese government regards fishing as a particularly important sector since it has contributed to reduce unemployment and helped to level out the balance of payments. Piscatorial products now rank first among Senegalese exports whereas previously the predominant exports were groundnut and phosphates. Fishing also contributes indirectly to the country's revenue through international fishing agreements.

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However, the fishing sector currently finds itself confronted with important challenges, both in terms of production and market supply. These disequilibria originate from a number of factors. Firstly, most of the piscatorial stocks of high commercial value have been overfished and are now threatened with extinction. Secondly, the use of increasingly harmful fishing techniques and disrespect of maritime regulations have led to serious degradation of Senegal's marine ecosystem, thus compromising the survival of many communities dependent on fishing for their livelihood.

The crisis in the fishing sector is also the consequence of a commercial policy that is decidedly externally focused; insufficient control of fishing licenses and direct or indirect subsidies have generated a detrimental increase in the production and trade of piscatorial products.

UNEP (United Nations Environment programme), Enda Diapol and CRODT/ISRA (Centre de Recherches Océanographiques de Dakar-Thiaroye) have already carried out a study on "Integrated Assessment of Trade Liberalization and Trade-Related Policies: A Country Study on the Fisheries Sector in Senegal". UNEP's primary objective is to sensitize fisherman stakeholders on the linkages between the environment, trade and the sustainable management of resources. This study was completed in 2001 and allowed for a more precise identification of the crisis factors and to take stock of the fishing sector in Senegal in the context of international trade liberalization. The study also made it possible to seek palliative measures to the crisis situation and reconcile the need for external competitiveness with trade liberalization, the sustainable management of resources and meeting the dietary needs of the population. The results and recommendations of this study have already been published and disseminated in the field among stakeholders (small-scale fishermen, fish wholesalers and women transformers).

Anxious to ensure this initial assessment was followed up, UNEP later intervened in the discussion forum in which all the actors of the fishing sector were involved, including all the stakeholders. This is how, in the context of the implementation of a global strategy, a Pilot

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Committee was set up, bringing together all the actors concerned. This committee included representatives from the fishing, trade and environmental ministries, professional fishing organizations (FENAGIE, CNPS and GAIPES) and research institutions (CRODT/ISRA, ISE and the University of Dakar). The output was a country study, the results of which translate the situation exposed hereafter.

The serious disequilibria with which the Senegalese fishing sector is confronted stems in part from a trade policy that focuses on the export of piscatorial products of high added value, which has rendered demersal fishing (focused on exports) markedly more profitable than pelagic fishing (focused on the internal market). These successive changes in the fishing efforts complicate the supply to local markets, threaten food security and could result in exposure to the risk of biological rupture of coastal demersal species. In addition, this situation has engendered a crisis in the transformation/conditioning sector because of the growing shortage of resources. This obviously compromises future Senegalese fish exports. The situation is aggravated by the existence of certain ill-adapted fishing agreements in relation to WTO (World Trade organization) norms and these further accentuate the tendency towards extraversion of the sector. Furthermore, insufficient valorization of piscatorial products constitutes one of the weak points of the fishing sector in Senegal already under social pressure because of the struggle for access to the resource.

The results of the “Integrated Assessment of Trade Liberalization and Trade-Related Policies: A Country Study on the Fisheries Sector in Senegal” led to the formulation of recommendations, some of which resemble conservation measures and others valorization measures. The objective is to ensure the sustainable management of Senegalese fisheries through the conservation of the resources and the valorization of piscatorial products. One of the first measures recommended in achieving this goal was to integrate a reduction in the production of coastal demersal species into current fishing agreements and supportive measures for current catches, and to enforce current regulations, especially those concerning the size of fishing net meshes and marketable species.

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New regulations have also been promoted to (i) ban or surcharge the export of currently threatened species, (ii) reduce the fishing effort of coastal demersals, (iii) respect the principle of freezing the number of licenses and (iv) base fees on the value of the species unloaded rather than on gross gauge tonnage. The institution of licenses for small-scale fishing units and a revision of the amount charged for resource access in the frame of fishing agreements (disguised subsidies) is also envisaged.

In order to better valorize piscatorial products it was recommended to favour internal discussions in view of a participatory planning of the fishing zones and to encourage the establishment of a connection with the structures responsible for studying the conservation and marketing of resources (CRODT and OEPS). The measures to be taken included the improvement of the infrastructure of the fisheries sector, in particular in terms of storage, roads and access to credit for investment in new technologies. Furthermore, it was considered desirable to favour the penetration into new markets for transformed products.

This is the context in which the three aforementioned partner institutions conducted the project for the implementation of measures for the sustainable management of piscatorial products in Senegal, and activities were undertaken to initiate the implementation of this second phase of the project. First, a meeting of the programme's Pilot Committee was held on 20 September 2002, bringing together the different Ministries of Fisheries, Environment and Trade as well as other actors concerned. The objective of this meeting was to determine the contours of the programme in conformity with the national action plan for fisheries. This also involved (i) defining a workplan and an intervention strategy that would include a revision of the recommendations that came out of the case study in order to identify those that were applicable, (ii) identifying an action-planning method and applying the chosen actions and finally (iii) determining those responsible for the application of each measure, which actors to involve and the human and financial resources that would be needed. Also, at this meeting activities had to be planned and expected results ascertained.

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Secondly, a workshop to validate the measures for the sustainable management and conservation of piscatorial products was held on 27 September 2003, bringing together all the concerned actors. The workshop brought together about 50 participants from the Senegalese fisheries sector. Two central work themes were presented to the participants in the form of talks, followed by the proposed plan of action to achieve the fixed goals. This second phase of the planning is due to stretch over a period of nine months. Two stages are planned in this framework. First a phase involving the implementation of the action plan that came out of the validation workshop and second the organization of a meeting between UNEP, the Ministry of Fisheries, Enda and other institutions for a final evaluation aimed at validating the results of the project, the level of results achieved in the application of the chosen economic instruments and the constraints encountered during implementation.

The present report is thus composed of three parts. The first part concerns the methodology used to implement the sustainable management of piscatorial resources. The second part presents the results of the complementary research on the regulation of resource access for small-scale fishing. And the third part concerns the organization of discussion forum on fishing regulations in Senegal and the recommendations that resulted from the implementation of the programme.

1

Methodology used for the Implementation of Measures for the Sustainable Management and Conservation of Piscatorial Resources in Senegal

In commissioning the case study concerning the Senegalese fishing sector, “Integrated Assessment of Trade Liberalization and Trade-Related Policies: A Country Study on the Fisheries Sector in Senegal”, UNEP had several objectives in mind. It was not just a question of promoting the coordination and cooperation between national organiza-

tions involved in fishing activities, but also achieving a consensus among national actors on the approaches that would allow a sustainable management of fisheries. It was also necessary to incite awareness among private sector decision-makers on the application of strategic recommendations, in particular the economic instruments that serve to promote a sustainable management of the fisheries.

It was also necessary to ensure the constraints and difficulties that may be faced in adapting the economic instruments to the situation were understood, and identify all the means for obtaining satisfactory results. To achieve this, a very precise method had to be adopted.

The methodology used can be broken down into two principal work themes, namely the research on the conditions and means for ensuring a regulation of resource access for small-scale fishing and the establishment of discussion forum aimed at ensuring an effective application of the regulations for maritime fishing in Senegal.

1.1 Methodology used to determine the conditions and means for ensuring the regulation of resource access for small-scale fishing

Gathering the actors perceptions, proposals and contributions required adopting a participatory approach to avoid conflicts between the different communities working within a same port and collect contributions that would be reliable and represent the point of view of the stakeholders. Consequently, efforts were deployed to ensure a high level of involvement of the stakeholder, irrespective of whether they were affiliated to professional organizations.

1.1.1 The choice of fishing centres and resource persons

The choice of fishing centres to be visited and working hours was made in a way that would ensure sufficiently representative audiences. Because of the interest of the actors on the regulation of resource access, Enda Diapol's initial ambition was to involve all the disembarkation

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sites for small-scale fishing in Senegal. However, because of the limited means available, meetings with fishermen had to be limited to the principal small-scale fishing sites of the Senegalese coastal region, but with the participation each time of actors from the secondary sites.

The decentralized services of the local fisheries administration were called upon for the identification of resource persons. The local representatives of national and local organizations were also contacted directly. In total, this research activity concerned about 30 fishing centres, affecting over 500 stakeholders of which about 90 per cent are fishermen (see Annex I - participants by site).

1.1.2 Organization of meetings by site

At each site, the resource persons, mostly professionals, organized meetings by fixing the date, time and place of the meeting and informing and mobilising the participants.

After the opening of each meeting by the person responsible for the decentralised fishing service (regional inspector or head of sector) in conformity with the participatory approach methodology, the research team coordinators made an introductory presentation, highlighting the current situation of the sector with a reminder of the results of the study carried out during the first phase of the project. A diagnostic of the constraints and difficulties within the different segments of the fisheries sector was followed by a presentation of the possible solutions and recommendations complemented by the definition of the various forms of access rights concessions during the discussion forum.

1.2 Methodology used for the discussion forum on the regulation of small-scale maritime fishing

The participation of all categories of actors concerned by the sector was particularly sought-after, and it is in this perspective that various actors were brought together, notably the different ministries and national leaderships (Ministry of Fisheries, Fisheries Management, Fish-

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eries Surveillance, Internal Trade, Taxes and Estates, Environmental Management as well as the Study and Planning Unit), the relative professional organizations (FENAGIE, CNPS, GAIPES, SPIDS, CNP) and the Non-Governmental Organizations involved in this initiative (OCEANIUM, WWF, CREDETIP, ENDA, ADPES).

With regard to the difficulties linked to the use of different modes of fishing, three work themes were retained, namely fishing devices, mesh and catch sizes and the demarcation of fishing zones. Each work theme was the subject of a two-day meeting in which all the categories of actors mentioned above participated. After the moderator's presentation, the participants carried out an exhaustive review of the laws and regulations relative to each theme before drawing up recommendations. At the end of each meeting, the moderator exposed all the recommendations and submitted them to the consensual approval of the participants. For each work theme a reporter was designated to make a report that had to be handed to the moderator at the end of the work meeting. The participants then organized a last validation meeting of the discussion forum report. However, the final validation of the results can only be done at the national dissemination workshop planned for this purpose.

2

Search for a Regulation Adapted to Resource Access for Small-Scale Fishing

2.1 How to regulate resource access for small-scale fishing

Nowadays, the problem of access to piscatorial resources has been made a priority of the Ministry of Fisheries in the context of its policy of ensuring the sustainability of the production of Senegalese marine resources. Indeed, the piscatorial resources constitute a national heritage that belongs to all the Senegalese. Consequently, since the State represents all the owners, it is also responsible for its management.

In view of this the Ministry of Fisheries put in place a work group to propose a concession system for resource access, under the coordination of the CEP (Study and Planning Unit) and with the participation of all the concerned structures and organizations. These meetings were organized by Enda Diapol in collaboration with the stakeholders and were aimed at not only widening the debate and gathering the perceptions of the actors, but also taking note of their proposals on the themes under discussion. In order to regulate resource access for small-scale fishing, answers to several questions had to be found, such as how to reduce the pressure caused by over-fishing and put a stop to the decline of resources, who would have access to the resource, what would be the criteria defining that right, and should there be a charge for access to the resource. Furthermore, it was necessary to determine if a concession made by the State to the local communities was still relevant for proper resource access regulation. If so, under what conditions and which local authority would be responsible for this concession. After this introductory presentation the person acting as President opened the debate session.

The shared responsibility of all the concerned actors is indisputable. However, the point here is not to situate responsibilities but rather propose solutions and explicate the advantages and disadvantages of each one in order to get the sector back on its feet and ensure its sustainability through discussions with all the actors of the fisheries sector. So, first the general perception of the actors in relation to the current state of the regulation of small-scale fishing was analysed, then the proposals made in relation to concessions and the payment of access rights were studied.

2.2 General perception of stakeholders on the regulation of the small-scale fishing sector

Everyone welcomed the innovative approach that consisted in conferring with all the actors, especially the stakeholders who thus felt valued. According to the small-scale fishermen, the absence of consultation has been the principal cause of failure in the application of

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fishing regulations in the past. The approach also allowed the stakeholders to become aware of the consequences of their actions. As a result they committed to gradually abandoning all the harmful fishing practices that have been preventing sustainable management, in order to preserve not only their activity but also the future of subsequent generations.

Contrary to a widespread notion, the stakeholders are not fundamentally against the regulation of resource access and the cessation of the free access regime. The putting in place of regulation instruments such as the obligation for small-scale fishermen to hold a license, permit or fishing authorization is in no way a taboo subject. This globally positive perception of the small-scale fishermen allowed them to advance concrete proposals for establishing regulatory measures. Most of the stakeholders favour the creation of some sort of internal organization aimed at regulating resource access and the domestic market because they now consider it necessary to regulate this sector efficiently. Their contributions have also been in relation to the sharing of responsibilities and the role that each actor should play.

One of the major constraints currently impeding the establishment of some form of internal regulation regarding the access to resources comes from the fact that small-scale fishing is an open activity that is no longer based on traditional knowledge. Indeed, nowadays anyone can own a boat and become a small-scale fisherman in total disregard of the traditional management system based on the recommendations and decisions of the elders and notables. In the past, it was the latter who decided to go to sea or temporarily interrupt fishing activities. This practice served to regulate access to the resource and was founded on empirical, religious and traditional knowledge. However, this practice is no longer possible in view of the economic dimension that the activity has taken on. Some elderly fishermen even maintain that the colonial administration involved fishermen a lot more in the management of the resource.

The stakeholders have long deplored the absence of discussion forum that would have prevented many misunderstandings between the various actors concerned with the fisheries sector. The lack of traditional

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anchorage in the regulation of fishing activities is the original cause of the difficulties experienced by the sector and affects the small-scale fishermen considerably more than the industrial fishermen.

The views of the fishermen give the impression that it is the category of non-professional small-scale fishermen with no traditional anchorage that are the origin of the current ailments of the sector. Thus, what can be seen in their proposals is a desire to exclude or restrict access to the category of non-professional small-scale fishermen, identified as being the farmer who has abandoned agricultural activities because of the drought, the storekeeper who is merely trying to increase his meagre income, the foreigner or the unemployed person from the city who has migrated towards the fishing centres and started up as a labourer before taking advantage of the free access situation and the financial opportunities available to the civil servant or shopkeeper to set himself up as a small-scale fisherman.

Currently, there is no question of reducing the number of fishermen but rather above all limiting their number by restricting access to the profession. Nevertheless, limiting the number of fishermen is a measure with limited effectiveness because it is one that would contribute to increasing poverty in Senegal. Indeed, a fisherman supports many people and to forbid the creation of new jobs for small-scale fishermen without providing palliative measures would be a mistake. In addition, the non-professional small-scale fisherman cannot be considered solely responsible for the degradation of the resources through the use of harmful fishing practices or as being the only victims of accidents at sea. Thus there appears to be *a de facto* acceptance of the notion of freezing small-scale fishing effort.

If the stakeholders are today requesting a form of internal regulation of the access to resources it is because they wish to be involved in the matters that concern them directly since it is in their interest. However, there is no question of the fishermen taking the place of the administration or of the latter discharging onto the stakeholders its responsibilities

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for surveillance and control that it is unable to carry out correctly. It is simply necessary to carry out a concerted initiative between the administration and all the stakeholders, not only with a view to adopting a regulation adapted to the realities in the field but also to effectively ensure that the regulation is respected. Consequently, it would be wiser to institute a form of concession of access rights involving all the stakeholders, the administration and taking into account other actor dynamics. The inspiration for this proposal came from the organizational models already in place at Cayar on the Petite Côte for the regulation of resource access.

According to a general perception of access rights, and in order to ensure an efficient concession system for access rights, the State must provide legal means for the decisions made by the organizations receiving those rights to have force of law and thus be respected. The Senegalese State will therefore have to make available police, gendarmerie, tribunal and administrative structures during the implementation phase of the measures to fight against the decline of the resources. Initially, these measures should only concern fishermen currently in activity; this should allow clarification and reinforcement of the relations between stakeholders and the administration but also between the fishing communities of different zones.

The stakeholders are fully aware of the conflicts that such a territorial concession system could arouse between neighbouring fishing communities. In this connection they indicate that these conflicts have already existed for a long time but the administration has never been able to do anything about them. Similarly, the stakeholders drew attention to the potential reticence of the beneficiaries when it comes to applying these measures. According to them all previous innovative measures in the small-scale fishing sector have been met with the opposition of interest groups the representation of which is subject to doubt. Another phenomenon that must be taken into account is the inevitable migration of small-scale fishermen.

Notwithstanding these eventual difficulties, the stakeholders are unanimous on the necessity of carrying out a profound reflection. Putting in place a concession system for access rights should constitute a means of settling once and for all any conflicts between small-scale and industrial fishing whilst protecting the fragile coastal zones. One of the sine qua non conditions for benefiting from access rights should be that the fishermen respect the regulation.

2.3 Proposals made by the stakeholders for a possible regulation of resource access

On the whole, the stakeholders are favourable to the regulation of resource access through the institution of access rights on the condition that certain prerogatives previously only held by the State are accorded to local communities. To ensure the effective application of concession measures to the recipient of the access rights concession, it is necessary to determine to which actors these measures apply, what is the demarcated zone of the concession, what are the conditions of access and, where are they applicable, what will be the modes of payment of these access rights.

The stakeholders' answers to these questions constitute their proposals for the regulation of access to resources for small-scale fishing, which brings us to a study of the legal framework for the recipient of the concession, the actors concerned by the concession, the territorial limits of the concession and the payment of resource access rights.

2.3.1 Legal framework for the recipient of the concession

The necessity of establishing an appropriate legal framework for the recipient of the concession is one of the problems that raises the greatest number of questions and suggestions. In order to better define the outline of such a framework, it is essential to take into account several factors, notably (i) greater involvement of the stakeholders in the regulation of fishing at a local level (small-scale fishermen, wholesalers, women

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transformers), as well as of notable persons or any other organizational process, (ii) greater involvement of local elected officials (municipal or rural councillors) in any structure with local responsibility for the concession and (iii) involvement and necessary support from the decentralized administrative structures such as the prefecture, the sub-prefecture, the gendarmerie, the police and the judicial power.

What emerges is that the recipient of the concession cannot be a corporatist structure such as a local fishermen's association without facing great difficulties. Neither can it be a decentralized structure such as, for example, a commune or rural community. What is needed is to find a local framework where all the forces, decision centres and organizations are represented. That framework does not yet exist.

The participants revisited extensively the project of putting in place local fishing councils. During the different meetings between the stakeholders and the fisheries administration in charge of this project, the local fishing council was seen as the best framework to receive the access rights concession at the local level. But the establishment of hegemony of one group over another had to be avoided when putting in place these councils because they are perceived as an extension and reinforcement of the spontaneous local regulation frameworks that have existed until now such as, for example, the fishing committee of Cayar. According to the participants, the local fishing council could ensure respect of the fishing regulations and fishing activities as a whole as long as its decisions are coercive and consensual. A real involvement of all actors concerned is thus vital. Also, another idea that was put forward was the creation of commissions within the local fishing councils. These commissions would be in charge of surveillance, security, delivering access rights, etc.

2.3.2 Actors concerned by the concession

Putting in place a concession system for resource access rights also implies the need to define who can benefit from rights and put in place

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regulations regarding resource access and to control the small-scale fishing effort.

In the course of the discussions, many fishermen maintained, “we know each other well, we know who is a fisherman and who is not. We know the pirogues owned by non-fishermen (civil servants, storekeepers, foreigners, industrials, etc.)”. Does this suggest the existence of a risk that discriminatory practices may develop?

In addition, several people underlined quite rightly that, when putting in place the concessions, an attitude of exclusion from or monopoly of the resource by one community to the detriment of the other must be avoided. For example, in Cayar, the Guet-Ndarienne community that has been set up in this zone for several decades should not be excluded.

In accordance with these prerogatives, the local fishing council should be capable of identifying legal claimants of the concession on the basis of precise criteria that include respecting the regulations and security norms. The council should also be in a position to decide on the maximum number of fishing units that a maritime territory under its control can support, in close collaboration with the research and without contradiction with the development plan drawn up for the sector.

The question of who has rights and who does not inevitably leads to other questions such as who is a fisherman and who is not. The actors' contributions showed that the system should not reject anyone at the outset but should freeze the global small-scale fishing effort.

On the basis that the objective is to reduce the pressure on the coastal resources caused by excessive fishing, criteria regarding membership of the profession of “fisherman” need to be determined and the attendant measures that would help to move gradually towards a reduction in the fishing effort must be established. The example of purse seines keeps coming back because this method requires taking on many non-fishermen and the only consideration is the need for many hands on board. Thus it became apparent that it was necessary to create professional

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cards that would attest to the capacities of the crew. This document should complement the access authorization document for the pirogue.

To ensure greater resource access control, construction of pirogues by carpenters should be subject to authorization. Such an authorization would have to be obtained by the carpenter from the local fishing council before any new construction. This task would be an example of his share of responsibility in the execution of the mission of the local fishing council as provided for in the national resources development plan.

2.3.3 Territorial limits of the concession

The stakeholders are in favour of the existence of fragmented territorial concessions as long as these take into account the traditional fishing zones. They also pointed out that the demarcation should take into consideration the size of the pirogue fleets, the workforce and the fishing units.

Concrete proposals for maritime territorial demarcation were made in some cases. For example, the fishermen of Soumbédioune suggested the demarcation of a territory stretching from Cap Manuel to the “boundary” with Ouakam. Proposals were also made along the lines of regrouping certain coastal maritime plots with the objective of establishing a larger territory that would be shared by the fishermen of the concerned localities. As an example, a communal territorial concession could be created between the villages of Ouakam, Ngor and Yoff on the one hand and between Thiaroye, Mbao, Rufisque and Bargny on the other. The administration will still have to carry out its responsibilities for an effective demarcation of the fishing zones (see Box 1).

2.3.4 Payment of resource access rights

Overall, there is a positive perception of the payment of access right for small-scale fishing as a means of regulating resource access. The permit, the license, and the fishing authorization are all perceived by many fishermen as a means of achieving better recognition and consid-

Box 1

The question of the demarcation of fishing zones

In view of the complexity of the zoning question and geographical, biological and socio-economic criteria that have to be taken into account, the administration will have to lean on the scientific facts when setting out its zoning proposals, in addition to considering the point of view of the stakeholders. Indeed, it should not be expected that all the solutions would be found by asking the opinions of the latter. In other words, the administration will have to face up to its responsibilities when demarcating the concession zones whilst attempting to work out what is at stake.

eration of small-scale fishing in general, and more specifically of small-scale fishermen, from the authorities in charge of small-scale fishing. Others perceive them as necessary instruments for the permanent identification and control that will help reduce fishing pressure.

In all the fishing centres visited a vast majority of the fishermen turned against their fellow fishermen to denounce the situation of injustice that has always existed but has never interested the owners of boats who got something out of it.

Attention was drawn to the fact that the wholesalers and women transformers bring their contributions to the functioning of the state on a daily basis by paying a variety of taxes, whilst the fishermen, all things considered, have spent all their time asking the State for help. Some maintained that the women retailers in the markets and the farmers also belong to the category of citizen actors and urged the audience to take note of this situation considered to be unfair in relation to other actors who were no more citizens than the fishermen. Many participants interpreted the numerous acts directed towards the women transformers as a consequence of this situation. Some said “The State does everything for

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the women transformers because they have shown the sector to be theirs by contributing first and making demands later.”

Many drew a parallel between the payment of access rights and the abundance of the resource by stating “if I pay to go fishing, it is to capture fish. How can I pay an access right if the resource is almost non-existent? Why wait till now, when it is difficult to make fishing profitable, to increase the charges? It is essential to find a solution to ensure the return of the fish to guarantee the payment of access to the resource.”

Obviously, acquiring access rights is a first and necessary step in securing investments that may be heavy but are often necessary. As an example, an equipped boat costs at least two million CFAF for the small, motorized pirogues using a line. Putting this proposal in place allows not only the regulation of access for the currently active small-scale fishermen, but also the limitation of access for any new fishermen that come along. Often traumatized by the severe restrictions they have to face to access the resource in neighbouring countries (Mauritania, Guinea Bissau) the fishermen advocate a reciprocal treatment with these bordering countries.

It should not be forgotten that Senegalese fishermen are obliged to migrate to these countries because of the present scarcity of resources rather than the other way round, although intrusions of nationals from bordering countries are reported more and more frequently in Senegalese coastal or estuary fishing zones. The neighbouring countries have regulated access to the resource, especially for foreign fishermen, in an effort to preserve their resources. This is an additional reason to regulate access to the resource in Senegal to protect small-scale fishing and favour the rehabilitation of piscatorial resources and damaged coastal marine habitats.

The establishment of an annual payment of resource access rights was suggested. Because of the risks incurred by the small-scale fishermen throughout the year some participants who were better

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informed on the current procedures for the allocation of fishing licenses for industrial fishing denounced their delivery for a short period, even for experimental purposes, because of the likeliness that the applicant would choose to fish only during the period of optimum abundance.

A majority thought that access rights should concern the boat rather than the captain of crew as some have suggested by drawing a parallel with driving licenses that are issued in the name of the driver not the vehicle. Associating the access right with the boat could facilitate the automatic registration of the latter. This does not prevent identification on the basis of the other documents of the captain and crew authorized to board a boat.

At all the fishing centres visited certain participants strongly defended the gratuity of resource access rights. However, the other participants indexed them and assimilated them to the category small-scale fishing boat owners who had several boats and only saw the financial aspect in light of the global cost of maintaining their fleet.

It was apparent during the discussions that coming up with an ideal concession system for access rights would require profound and patient reflection to achieve the anticipated results. Indeed, the actors noted that, over and above the exclusion of those that currently belong to the category of “non-fishermen”, a numerical replacement of non-fishermen by persons coming from fishing families would not change the situation in relation to the already heavy pressure on the resources as a result of fishing. Therefore, the crucial questions that must first be dealt with concern the definition of criteria that will be used to decide who will be members of the concession and who among them may receive resource access rights or, in other words, be a fisherman. The actors underlined that, to avoid the numerical replacement of non-fishermen with traditional fishermen and thus maintain the current situation, it will be necessary to accept from the outset that belonging to a traditional fishing family is not a sufficient criteria for acquiring resource access rights. These access rights will be exclusively in the form of a fishing license or permit.

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The delivery of access rights will also be subject to one particular condition, which is the respect of fishing regulations and security norms on the boat. Non-respect of this condition will lead to sanctions that may include the suspension or withdrawal of access rights for the boat.

2.3.4.a Stakeholders define the criteria to determine the fee for resource access rights

These criteria include the size of the pirogue, the type of pirogue (with or without motor) and the type of fishing. As far as the latter criteria is concerned, opinions are divided as to its applicability, on the one hand because of the possibility of the variety of devices used by the fishermen and, on the other hand, the seasonal migrations (see Box 2).

The table below presents the synthesized proposals set out by the stakeholders for the payment of access rights according to criteria that they themselves defined, specifying that the total amount of the access

Box 2

The variety of devices makes the criteria “type of fishing” difficult to apply. The type of fishing used on a boat during an outing may change depending on the availability of the different types of resources. On the other hand, the criteria “size of the pirogue” seem easy to implement.

Following the example of countries in the sub-region, the power of the motor used should be taken into account for motorized boats. However, depending on the level of degradation of the habitats, the fishing zones and the efficiency of the devices used additional criteria could be considered in order to better evaluate the cost of access rights.

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right corresponds to the cumulated amounts depending on the situation of each boat.

2.3.4.b Proposals made to ensure a good functioning of the system

The stakeholders brought up many points that can be considered as conditions for guaranteeing a good functionality and the success of the system of payment of access rights, as this is perceived as being an integral part of a global operation for the regulation of the access to the resource.

Table synthesizing the proposals on the cost of resource access

<i>Criteria</i>	<i>Type of vessel and device</i>	<i>Annual Amount CFAF</i>
Vessel	Without motor	500
	With motor	1 000
Size of the vessel	large	15 000
	Medium	10 000
	Small	5 000
Type of fishing	Ice box vessel	15 000, 12 500, 10 000
	Daily catch	2 500, 4000
	Angling fishing	10 000, 5 000, 2 500
	Purse seine	20 000, 10 000
	Diverting nets	10 000, 6 000, 7 500
	Drift nets	15 000
	Shrimp trawler	10 000, 20 000

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Thus the discussion often came back to the subject of the role of the local fishing councils. Indeed, the latter are designated as being not only the recipient of the concession in the different fishing zones but also the authority that delivers the fishing licenses.

To guarantee the payment of access rights, ensure a good functionality of the local fishing councils and in view of the latter's central role the stakeholders recommended that a ten percent rebate on rights should be reserved for the local councils. The rebate is considered an incentive to pay access rights. It should not be denied that the local fishing councils also require financial means in view of the importance of their responsibilities. Finally, it was clear and accepted by a majority of the participants that the access rights should be paid to the State Treasury whatever the mechanisms put in place to this effect.

2.3.4.c *Contributions relative to the payment of access rights drawn up by the stakeholders*

Some of these contributions are presented here below. Firstly, once the fees, modalities and procedures have been fixed, no other expenses or taxes should recur after delivery of the fishing license without prior consultation with the stakeholders. Secondly, as soon as the system starts up the boats should be registered so that they can be positively identified and thus easily controlled and kept under surveillance and the pirogues should undergo annual technical inspections to determine their seaworthiness and their compliance with predefined security conditions. Thirdly, putting in place an insurance system for the pirogues should be envisaged to complement the payment of access rights. Finally, in addition to the fishing licenses or permits, professional cards for the fishermen should be delivered by the local fishing councils in partnership with the local communities of the fishermen and the fisheries administration that manages the fishing training centres.

2.3.5 Other conditions and attendant measures recommended by the stakeholders

Although the development of certain fisheries has been recommended with a view to protect threatened species such as the stone bass, it is necessary to complete the regulation with measures that are better aimed at conserving the resources, for example by forbidding certain fishing devices such as the palangrotte (traditional hand-held line) or defining zones where they may be used.

Besides, banned fishing devices that are still in use are responsible for the growing shortage of resources and the destruction of habitats. Manifest examples of fishermen who defy regulations and only concern themselves with size of their catches abound in the different fishing zones. Harmful practices, such as the use of dynamite, the autonomous deep-sea fishing using tanks and the use of monofilaments or multifilaments, can still be seen.

A programme or daily calendar for the outings of the pirogues should be associated with the delivery of an access permit for each fishing site. In this way it would be possible to effectively reduce the fishing pressure applied daily on the resource and go beyond the mere freezing of the effort (see Box 3).

The stakeholders pointed out that the administration should not off-load the problems it has been unable to solve at the level of the under-sector through the system of concessions for access rights. Thus the administration will have to delegate real prerogatives to the local communities through the local fishing councils in order to ensure the efficiency of its action.

For their part, the fishermen indicate that they are prepared to work in collaboration with the agents of the fisheries administration with regard to the control and surveillance of fishing activities, without actually doing the work in their place. The fishermen also demand that the National Assembly vote on all the texts relative to the access rights concession, the putting in place of measures and the mode of functioning of the local

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Box 3

The inevitable question of quotas

The stakeholders recommend carrying out an inventory of the current pirogue fleet in order to determine the level of concentration at certain fishing sites. Indeed, numerous sites are saturated and thus have a fishing overcapacity that exacerbates the conflicts and further impoverishes the traditional fishing areas on a daily basis.

These recommendations made by the stakeholders demonstrate their desire to adopt sustainable fishing practices. However, it should not be forgotten that, to effectively arrive at a limitation of the fishing effort, it is essential to take into account the state of the stocks of the targeted species, of their geographical spread as well as other scientific knowledge that makes it possible to determine the levels of effort and capture that can be applied by zone and by season for both small-scale and industrial fishing. This knowledge should make it possible to determine the maximum quotas for sustainable production.

Thus, even though the stakeholders only addressed this question indirectly, it seems necessary to us to underline the essential role of piscatorial research in the whole process of access rights concessions and the importance of renewing this research on an annual basis.

fishing councils so that they have force of law. This need for a legal basis is linked to their need for legitimization and recognition in order to facilitate the application of consensual decisions taken by the majority of actors at the local level.

Other important points brought up by the stakeholders concern proposals that can be qualified as attendant measures to facilitate the regulation of access to small-scale fishing. They also point out that it is urgent to find solutions to all the conflict situations currently experienced by the Senegalese fishing sector. The first seats of tension that should be tackled are

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those linked to the conflicts on the types of fishing and the access to certain fishing zones. Leaving these conflicts unsolved is equivalent to transferring the problems to other levels where it is far from certain that solutions will be found. It is thus urgent for the fisheries administration to become involved now in order to find solutions on the basis of existing regulations.

The stakeholders attracted attention to the responsibility of industrial fishing in the degradation of piscatorial resources and fragile coastal habitats as well as to the thorny issue of discard. They also insisted on the need to reinforce the means at the disposal of the authorities in charge of the surveillance and implement effective sanctions according to the regulations. This should allow the resolution of problems caused by the substantial discards of marketable species by small-scale fishing or as a result of illegal fishing practices. This sentiment of impunity in relation to illegal fishing is widely shared among the participants in the principal fishing ports in Senegal.

All small-scale fishing centres have made insistent demands for the coastal region forbidden to trawlers to be extended. Many proposals have been put forward on this subject, but they all converge towards the choice of 12 nautical miles instead of the current six. Generally, all wish for better regulation that would limit the industrial fishing effort.

As far as the fishing agreements are concerned, the global perception of small-scale fishermen is still negative because these agreements are considered to be one of the factors that have led to a marked over-capacity of both small-scale and industrial fishing. Some actors even went as far as proposing that other solutions should be found, for example by substituting the financial counterpart of the fishing agreements with the institution of a financial contribution of the small-scale fishermen and national industrial fishermen. Others suggested linking the payment of resource access rights for small-scale fishing to a progressive reduction of fishing quotas offered in the fishing agreements.

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The stakeholders also asked the administration to tackle other problems, notably (i) the institution of a stricter regulation for deep-sea fishing and (ii) effective sanctions against the practices of industrial fishermen that cause marine pollution, for example banning of very harmful chemical substances that destroy the coastal ecosystems and drive the fish away from the traditional fishing zones.

As far as the category of “non-fishermen” actors/owners are concerned, there is a need to identify civil servants and fishing industrials who own small-scale fishing units and exclude them from the concession system for small-scale fishing resource access rights.

Other attendant measures were suggested by the stakeholders, such as (i) facilitating the access to credit and fishing materials to allow the re-conversion of types of fishing and elimination of certain harmful fishing devices, (ii) putting in place cold-chains to allow the conservation of production surplus and reduction of losses after capture in the production segment, (iii) restoring fragile marine habitats (rocks, herbariums, etc.) and spawning zones that have been damaged or destroyed by putting in place artificial reefs and, finally, (iv) finding sustainable solutions to the conflicts that often oppose the fishing communities and the hotel complexes, especially on the Petite Côte and at Sine Saloum.

All the stakeholders, who are well aware of their limits and difficulties, requested that many information, sensitization and training activities be held at the landing sites. They would also like to be informed about the results of the research and the application of regulatory measures included in the fishing code.

To efficiently implement the regulation of small-scale fishing resource access it is necessary to first complete a number of steps, namely (i) putting in place the local fishing councils, (ii) demarcating the small-scale fishing zones, (iii) planning activities relating to training, information and sensitising actors on the regulation of resource access for small-scale fishing, on the local fishing councils (CLP) and on the regulations in general, (iv) listing and registering the vessels, and (v) putting in place

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professional cards for fishermen, delivered by the CLP in partnership with the local communities and the fisheries administration, which has training centres on fishing activities.

The meetings highlighted the need to pursue the reflection on the implementation of a sustainable management of piscatorial resources in a discussion forum. The objective was to have as many actors of the fishing sector participate in the search for an effective regulation. The discussion forum allowed a democratic debate between all actors of the fishing sector and had unanimous support.

3

Discussion Forum on the Regulation of Fishing in Senegal

3.1 The non-application of regulations

It is undeniable that the regulation of the fishing sector in Senegal still presents serious gaps despite the efforts to codify the sector. The general assessment is that the regulation of the fishing sector is not only badly applied but also insufficient and ill adapted to the reality in the field. Furthermore, the conflicts relative to the types of fishing or the demarcation of the fishing zones are increasing among the different categories of actors working in the sector.

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The discussion forum was aimed to be carried out, in a participatory and consensual manner, for the improvement and adaptation of the regulatory texts on the Senegalese fishing sector in conformity with the realities in the field and their effective application. In order to move forward an analysis will have to be made. This analysis was made on the basis of two fundamental legal texts, namely Law no. 98-32 of April 14, 1998 instituting the maritime fishing code and its implementing decree (decree no. 98/498 of June 10, 1998).

The non-application of the fishing regulation comes from the inefficiency of the system use of control and surveillance. The reality in the field reveals other negative points such as the lack of human, financial and logistical resources, the absence of emergency procedures to pronounce immediate sanctions and the absence of a transaction procedure adapted to small-scale fishing.

The current regulation is often inappropriate and difficult to apply. Indeed, certain regulatory approaches are overly directive, lacking educational, informational and communicative aspects, and do not take into account the need to sensitize the actors concerned, especially those in small-scale fishing. Furthermore, the national and local consultative bodies lack decision powers.

In view of the shortcomings in the application and in some cases non-application of the law, it was obvious that the stakeholders' preoccupations, the attendant measures they suggested and their apprehensions regarding the geographical, technical and economical production conditions would have to be taken into account. This new attitude of the authorities vis-à-vis the stakeholders demonstrate that there is a real political will to seek a consensual voice that would ensure greater selectivity in the types of piscatorial production, effective regulation of the fishing effort, especially to the benefit of the more endangered species and, consequently, a better synergy between the bottleneck effect of the access rights regime and the objectifying of such rights (cost, productivity, quota, nature and a sustainable fishing production).

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It is thus essential to associate access rights with the respect of the production system. For example, if the use of access modes in maritime waters and in estuaries is not linked to the nature of the production and the use of fishing modes, it could quickly become inefficient. Similarly, the association of the access right and respect of the production system is essential in that it allows the neutralization of certain fishing strategies (sometimes referred to as bypass strategies) and the considerable modification of the nature of the campaigns organized by the fishermen. Hence, in the long term this link can modify the behaviour of the fishermen and prevent their customary tendency to overfish, target certain fish species irrespective of the state of stocks and the reproductive seasons. Finally, it is also a means of balancing the fishing policy between the under-regulated small-scale fishing sector and the measures applied in the industrial sub-sector that are subject to limitation of action by lapse of time.

For this reason, this part of the report focuses on reviewing the different regulatory systems that are not being applied and attempts to determine the impacts this has on the sustainability of the piscatorial resources. In addition, the discussion forum has drawn up recommendations for arriving at a better application of the Senegalese fishing regulations. This study will now look at the different fishing modes that are forbidden but still being used by small-scale fishing, the banned industrial fishing devices, deep-sea fishing and the fishing devices authorized in maritime waters under Senegalese jurisdiction.

3.1.1 Small-scale fishing devices that are banned but still being used

The fishing techniques and devices that are banned according to the regulation but still being used by small-scale fishermen are responsible for the destruction of marine fauna and flora. These include fishing using explosives or poison and the use of monofilament or multifilament nets.

3.1.1.a *Fishing using explosives or poison*

Despite the fact that their use is banned, some small-scale fishermen persist in using explosives and poison to fish even though these techniques are unanimously considered to be dangerous in addition to causing serious damage to the resources and the environment. The use of dynamite destroys rocky zones that are essential spawning grounds for many species. Moreover, it has been noted that this phenomenon has spread which was previously confined to Yoff, Ngor and Ouakam, it has now been reported in other zones such as Bargny, Ngaparou and Cayar. It is quite surprising to note the absence of criminal sanctions even though these are provided for in article 13 of the United Nations Convention on the Law of the Sea, and the inadequacy of the fines inflicted (between 15 000 and 50 000 CFAF) in relation to the damaged caused.

In searching for solutions to this problem the following recommendations were put forward to fight this type of fishing:

- Reinforce the fines in order to dissuade offenders.
- Allow for appropriate criminal sanctions in the Environmental Code.
- Examine the protective clauses in the United Nations Convention on the Law of the Sea in order to find which measures would allow for a reinforcement of the sanctions against offenders.

3.1.1.b *Use of monofilament or multifilament nets*

The use of monofilament and multifilament nets is also deplored, even though these are forbidden in the same capacity as the use of poison in fishing. Gill nets made from elements of monofilament or multifilament, although prohibited (article 30 of the implementation decree), are still being used in small-scale fishing. In addition, their non-biodegradable nature makes them environmentally harmful and, moreover, when constantly left at sea they favour “ghost fishing.”

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The lack of respect of the regulation is a source of conflict between fishing communities. However, a progressive change in attitude has been noted within the small-scale fishing communities, which are becoming increasingly aware of their accountability in overfishing and therefore now ensure that their fishing practices are in conformity with the regulation. This form of surveillance is recommended by the local communities but nevertheless sometimes comes into conflict with the delinquent practices of some fishermen (Cayar is one illustrative example) as do certain measures taken in this capacity in the rural communities and villages of Sine Saloum. The fishing authorities of Cayar have taken the initiative of simply forbidding the use of monofilament and multifilament nets.

Because of the heavy investment by fishermen to equip themselves with monofilament nets, the discussion forum concluded that it was necessary to allow them more time before applying a strict regulation so that their investments in fishing devices could pay for themselves. They also made the following recommendations:

- To issue a service note for the customs banning not only their marketing and use but also any form of special derogatory regime.
- To request the Ministry of Trade and Finance to refer the matter to the UEMOA so that the regulation becomes communal.
- To make use of radio and television to sensitize the stakeholders on the urgency of applying the regulation.

The ban on the use of monofilament and multifilament nets constitutes one of the most sensitive points of the fishing sector regulation, and regulating the matter will not be an easy task. For the moment, no solution has been found at the national level.

Over and above these fishing techniques, resource production also raises the problem regarding the use of banned industrial fishing devices.

3.1.2 Banned industrial fishing devices

There are principally five types of industrial fishing devices that have been banned.

3.1.2.a *Twin trawler (chalut à bœuf)*

The twin trawler system involves two trawlers fishing with one net between them. The extensive catching capacity of this device goes against the desire to ensure the permanence of the piscatorial resources. The Russians and the Chinese were masters in the art of its use. The consequences of this fishing technique are devastating. Its ban in Senegalese waters led a fishing company established in Senegal (Senegal Pêche) to look for fishing licenses in neighbouring countries, hence the problem has only been moved to bordering States.

3.1.2.b *Nephrops gillnets*

This type of net has contributed to decimating a large stock of lobsters. It was first used by the French flotilla in Mauritania then by the Portuguese flotilla in Guinea Bissau.

3.1.2.c *Tuna diverting gill nets*

This is a long net of about 10 to 15 kilometres with an extraordinary depth. The ban was an international measure taken by the ICCAT and was integrated into the Senegalese regulation.

3.1.2.d *Trawlers exceeding 400 gauge tonnage for coastal shrimp fishing*

The principle is that the bigger the vessel, the greater fishing effort. Large vessels are thus restricted to fishing in open seas.

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3.1.2.e *Sardine trawlers exceeding 1500 gauge tonnage (1987 law)*

These units were forbidden in order to maintain the equilibrium of admissible catches between small-scale and industrial fishing. In small-scale fishing the boats have at low capacity compared to those used in industrial fishing and are thus disadvantage with regard to this targeted resource production.

Some companies based in Senegal (mainly Norwegian) requested the right to use their own fleets. They had large ships that captured enormous quantities of sardinella (one of them caught nearly 400 tons in a single tide). Based on these experiences, the Senegalese authorities decided to ban them from waters under Senegalese jurisdiction.

The discussions on all these questions led to recommendations that indicate that the time has come to make use of the notes and results from the research that prove that the quantification of captures in relation to gauge tonnage is not a good system for evaluating the fishing effort. It should be combined with the evaluation of the traction power at a fixed point, but a sub-regional approach should also be envisaged in view of harmonizing regulations. Finally, in the long term, the ban on vessels of a certain gauge should be replaced by a quota system in conformity with the advice of the research.

These recommendations are only aimed at banned fishing devices and not those authorized by the law and described below.

3.1.3 Deep-sea fishing

At first, this form of fishing was practiced as a non-lucrative leisure activity. Nowadays it has become a profitable profession. It has propagated very rapidly, particularly at Ngor, with the emergence of exclusive fishermen/divers. Due to tourism, this type of fishing is practiced a lot on the Petite Côte. At Mbour, for example, certain fishermen use this type of fishing to catch lobster. The propagation of this form of fishing

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can be explained by its profitability and the time gained that it allows. What makes the technique especially profitable is that it targets large breeding fish.

The procedures used for their capture often require the use of spear guns, which can be as devastating as explosives. A single gunshot causes a lot of damage to groups of fish especially as their (external) reproduction takes place at a very specific period. This type of fishing is very risky for the environment and the security of those that practice it, and caused the death of 3 fishermen at Soumbédioune in 2002.

The regulation concerning deep-sea fishing is insufficient and the sanctions provided are inadequate and badly applied. No regulatory measure is included in the fishing code, although decree 1967 (No. 67 – 386 of April 13, 1967) regulates it. The surveillance of this type of fishing is, in principle, the responsibility of the Directorate of National Parks (DPN) of Senegal.

The discussions during the meeting led to the following recommendations:

- Preferably place the management of deep-sea fishing in the hands of the Ministry in charge of fisheries to ensure coherence in the management of fisheries.
- Involve the future local councils in a preventative mission once the ban on this type of fishing has become effective and greater involvement of fishermen to fight it.
- In the short term, since the decree talks of approved organizations, the latter should be given the management of this type of fishing. Furthermore, all candidates of this practice should approach the associations and consequently the possibility of individual requests should be removed from the decree.
- Forbid the import of arrows with hooks that are widely used by the small-scale fishermen.

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In the end, several solutions with varying degrees of effectiveness were envisaged to ensure that the current fishing regulation was applied. These solutions should reinforce the surveillance and control, the dissuasive sanctions and the continuation of a consensual and consultative approach involving all the stakeholders concerned. They include the sensitization and training of small-scale fishermen, wholesalers, women transformers, and demands of a responsible and durable management of the resources.

At this time, these measures are still under debate. However, it is undeniable that awareness of the problem is generalized and the choice of opting for fishing techniques that will allow a sustainable production of piscatorial resources is almost unanimous. But over and above the fishing techniques, the question of production raises the problem resulting from the use of banned industrial fishing devices.

3.2 Fishing devices authorized in maritime waters under Senegalese jurisdiction

The use of non-selective devices has greatly accentuated overfishing, irrespective of whether they are industrial or small-scale fishing devices. The result is a succession of negative effects such as the decline in catches, the increase in producers' prices, the disruption of local market supply and the threat to the food security of households, as well as the tensions between socio-professional categories in relation to access to maritime products, especially between the women transformers and the wholesalers.

The discussions concerning the devices legally authorized in Senegalese maritime waters were about their biological and socio-economic aspects. The reflection was articulated around the main question, *“To what extent does the mesh size of the nets used in both industrial and small-scale fishing undermine the reproduction capacity of piscatorial resources?”*.

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The authorization to use nets with a 130 mm mesh for bottom gill nets (Code 74) to 100 (Codes 87 and 98) has been interpreted in the discussion forum as a decision made by the administration of fisheries to ensure continued supply to local markets in a context of limited resources. The analysis thus made concerns first small-scale fishing and then industrial fishing.

3.2.1 Small-scale fishing

In small-scale fishing the problem is mainly but not exclusively related to the use of different fishing techniques. These are presented hereunder.

3.2.1.a *Bottom gill nets*

Bottom gill nets are made up of several assembled layers. The length, drop and dimensions of the meshes are established based on the targeted species. We can thus distinguish dormant nets targeting fish such as *Sardinella mullet*, dormant nets used to target sea snails (*Cymbium spp*) and dormant nets for lobster.

Ecologically, the use of bottom gill nets in rocky ecological niches is a source of conflict and ecological threat. Socially, it brings about technological and spatial conflicts among fishermen. The case of Cayar is a perfect illustration (bottom gill nets versus angling fishing). Biologically, the use of these devices threatens the reproductive zones of several species. In the case of the Sine Saloum islands, these devices are widely used and represent an important source of revenue for the populations who depend on it exclusively.

In view of all these considerations, it will be difficult to totally ban bottom gill nets on all the maritime and continental fisheries. Its ban must be envisaged in certain zones and at certain times.

Prior to adopting this measure, the discussion forum expressed the need to draw up an inventory (of fragile habitats, resource use of the targeted species, better comprehension of the trajectory of fisheries and fishermen behaviour, etc.).

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In the short term, a ban on bottom gill nets in the spawning grounds should be envisaged. But such a measure could be misunderstood and cause social tensions in many fishing centres so the consensual approach must be adopted at each stage while putting forward the principal of reproduction of the resources over time.

3.2.1.b *Surface gill nets*

Many changes have been noted in relation to the surface gill net. The size of the meshes no longer constitutes the only issue regarding this fishing device.

Faced with a decline in catches, the fishermen have more than doubled the length of the nets which, have increased from 300 meters to more than 1000 meters. In parallel, the drop of the net has increased considerably thus allowing the fishermen to access fish at the surface as well as at the bottom. According to the fishermen, this device also allows the capture of lobster at depths of 200 meters.

This fishing strategy posed two major problems; firstly, a return of social pressures (spatial and technological conflicts between small-scale fishermen) and, secondly, a threat to sustainable reproduction of the resources.

The discussion forum recommends (i) the adoption of a stricter regulation to guard against the strategic versatility of this device (fishing on the surface and at the bottom) and (ii) a stricter control of the number of layers of the net.

3.2.1.c *Shrimp nets*

These devices are used most actively in the estuaries. Contrary to other fisheries, shrimp fishing is subject to the authorized opening and closing of the season by the local administrative authorities (regional inspection, prefecture).

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The existence of a market for immature fish combined with a lack of human and logistical means of the fishing services to control the production activities has encouraged fishermen to use nets with mesh size 8 instead of the mesh size 12 authorized.

The lack of coordination between the different regional inspection services (Fatick and Foundiougne) that intervene at the same natural environment has favoured overfishing in the region. It has nevertheless been noted that there is an important deferment of the fishing effort from one region to another depending on the periods of opening and closing fixed by the different tutelary authorities.

The recommendations of the discussion forum were:

- Categorize the shrimp devices, especially for small-scale fishing.
- Manage and develop the estuary and maritime zones taking into account their specificity, as the estuary plays an important role in the reproduction cycle of the resource.
- Favour a concerted approach in the determination of the opening and closing periods of the shrimp fisheries of Saloum. In addition, bring together the two regional inspections (Fatick and Kaolack), the local administrative authority (prefecture) and stakeholders (mainly factory owners and wholesalers) in the management of these fisheries. Because of the demand, factory owners and wholesalers often encourage the capture of immature fish.
- The involvement of local communities should be considered in the management of this sector.

It is thus crucial to provide institutional support to the local fishing administration by providing the means for its mobility in view of the distance between the landing site and the point of collection of the products.

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3.2.1.d *Beach seines*

This device is relatively important. It mainly brings in juveniles measuring between 3 and 15 centimetres. The use of very small mesh sizes commonly known as “*mosquito nets*” favours the strong predominance of juveniles in the landings of the beach seines. Their negative impact on the piscatorial resources is evident.

The beach seine is practiced on the coastal front and in the continental zone. The specificity of the two fishing territories offers a different appreciation of the impact of its use in social and environmental terms.

On the coastal front this fishing activity is essentially practiced in the region of Dakar and on the Petite Côte. The fishing units have decreased considerably in number and are privately owned, except at Yoff. The sizes of the pirogues and nets have also greatly reduced; the boats have gone from 16 to 10 meters in length on average and the nets from 1000 to 200 meters. But these mutations have not necessarily encouraged a reduction of the fishing pressure; a fishing unit now tends to make several trips a day, five on average compared to one trip with a larger net.

With regard to continental fishing, it has been noted that the beach seines represent an important part of the fleets with nets exceeding 1000 meters. The property structures show that these units are generally of the village type, hence the important role they play in the local social structure.

The discussion forum recommends a complete ban of beach seines in the maritime zone. The project “*Narou Euleuk*” is working towards an indemnification of the owners of beach seines in the Rufisque-Bargny zone in view of destroying these devices and creating alternative activities for the fishermen. The regulation of access to the resources for the beach seines used in continental fishing has become essential in view of their great numbers. Nevertheless, the social dimension must be taken into account in any effort to regulate the use of beach seines.

3.2.1.e *Purse seines*

The length of this type of seine has doubled during the last 20 years, passing from 200 to 400 meters for a drop of 42 to 48 meters. The size of the stretched meshes is 28 to 30 millimetres at the level of the pocket. Pirogue sizes have increased from 14 to 21 meters. Some of the main species targeted using the purse seine include the round sardinella, the madeiran sardinella, the false scad, the bonite mackerel, the little tuny, and the crevalle jack.

Most of this type of fishing activity is concentrated in the fishing zone situated between Dakar and the northern boundary with Gambia. The heavy pressure exerted by this fleet is now causing localized over-fishing (Petite Côte) of small coastal pelagics. The drop in sales noted at the big landing centres has forced the fishermen to try and regulate the fish prices by limiting the fishing effort (single daily trip, rotation of the fishing units). The fishermen present these economical preoccupations as a collective conscience for the protection of resources.

The drop in profitability of the purse seines noted since the devaluation of the CFAF have forced the fishermen to opt for a progressive decapitalization (reduction in size of the vessels from 18 to 22 meters to 14 meters and the length of the nets from 400 to 200 meters). To maximize the profits from an outing, the fishermen use small meshes that scrape up everything in their passage. The catching of juvenile fish is encouraged by the strong demand from factories producing fish meal (in Dakar) and the traders originating from the Gulf of Guinea.

The relative fishing services remain powerless in the face of this waste of piscatorial resources. The administration justifies the failings noted in the control of fishing activities by the lack of workers.

The discussion forum encourages the initiatives taken by the fishing communities to regulate the fishing effort using purse seines. It recommends the institutionalization of such measures.

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3.2.1.f *Surrounding gill nets*

Surrounding gill nets measure 250 to 450 meters in length with a drop of 7 to 12 meters (stretched mesh) and the stretched meshes measure between 60 millimetres (small meshes for sardinella) and 80 millimetres (large meshes for ethmalosa). These are used with pirogues of 12 to 15 metres equipped with outboard motors of 15 to 25 HP. The crew is composed of six to eight persons.

The small mesh nets, which are much more numerous, are used all year because the target species, the madeiran sardinella, is always present in the activity zone of this fishery situated to the south of the Petite Côte. This fishing technique, a cross between the beach seine and the purse seine, is heavily localized, especially at Joal on the Petite Côte and the Saloum Islands. They also operate seasonally in the estuary zone but it is difficult to determine their impact with precision. Certain signs (Biomass and length of the fish) suggest that stock levels are good. Nevertheless, the fish smoking of large quantities of ethmalosa has led to degradation or even disappearance of mangroves.

The discussion forum recommends carrying out research in the estuary zones in order to better assess the fishing effort and the level of production. An impact study of the development of fish smoking on the mangrove has also been proposed.

3.2.1.g *Cast nets*

This device is used in coastal zones (maritime, estuary and continental). It is used alone or in combination with other devices. Cast net fishing is considered as a subsistence activity even if small amounts of the catch may be sold. Nevertheless, the heavy pollution of the coastal zone limits the development of this type of fishing. The impact of the device on the resource has not been fully ascertained. It is thus suggested to evaluate its effect on the piscatorial resources.

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To conclude on this point concerning devices authorized in waters under Senegalese jurisdiction, the discussion forum noted that the specific conditions of use of certain devices as decreed in article 31 of the decree (coastal palangrotte – dormant shrimp nets - trammel nets, etc) are ignored. Rectifications must therefore be made in this sense.

The discussion forum recommends the application of the regulation through close control. This presupposes reinforcing the workforce of fishing agents, providing them with adequate training, allocating more extensive prerogatives to the fishing technicians and putting in place more dissuasive fines (especially for fishing with explosives).

Article 87 of the fishing code stipulates in its last paragraph that a decree of the Minister of Fisheries was supposed to fix the conditions of application of sanctions for offences proposed to the small-scale fishing sector. Unfortunately this decree was never taken on.

Because of the dynamism of the sector, a periodic evaluation of the application of the regulation has been proposed in order to identify any blockages and constraints and to bring about adequate solutions. It is essential to encourage a consultative approach in managing the sector. The local fishing councils in the process of being institutionalized may thus lay the foundations for a proper application of the regulatory measures relative to the fishing units. This measure could be complemented with a disciplinary system associating the fishing communities with issuing fines.

Industrial fishing is better regulated than small-scale fishing, however it still poses just as many problems, an analysis of which is given here below.

3.2.2 Industrial fishing

The presence of observers on board boats operating in the frame of the fishing agreements guarantees a fairly good application of the regulatory measures governing their activities, which is not at all the

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case for the Senegalese ships. Most of the offences noted (incursions into exclusive zones, non-respect of fishing meshes, use of devices not authorized within the allocated license, etc.) fall within the competence of the national control units. Industrial fishing, however, poses fewer problems in terms of the size of the species landed compared to small-scale fishing.

The recommendations drawn up by the discussion forum for a better regulation of industrial fishing are as follows:

- Place an observer on board each Senegalese boat to ensure that regulations regarding fishing zones, mesh size and minimum landing size of species are respected.
- Ensure that observers are fully autonomous in relation to the Senegalese and foreign ship owners by offering a competitive salary. The funds necessary to cover these expenses may come from several sources, such as the counterpart of the fishing agreements, a bilateral cooperation, income from fishing licenses, etc.
- Put in place a sustainable and transparent system to follow-up and control the work carried out by the observers. A private management of the observer constituent was proposed. The chosen agency would have to work according to terms of reference proposed by the administration and undergo periodical evaluations.
- Reinforce the means for surveillance with a more substantial spatio-temporal coverage.

3.3 Minimum landing size and fishing zones

Controlling the minimum landing size in the fishing zones is also an indispensable tool in the regulation of the fishing effort.

3.3.1 Minimum landing size

During the first phase of the country study, the research highlighted a considerable decrease in the average size of the demersal species caught, particularly the family of coastal demersals.

In order to inform and bring the participants up to date, the research provided a working document with a graphic presentation of the types of fishery resources being produced in the EEZ of Senegal (fish, crustaceans, cephalopods, and shellfish) and for the use in scientific studies or regulatory measurements (see Annex 5).

A detailed description was made of the different sketches representing the general morphology of the different types of resources and a precise definition of the measured dimensions. One difficulty that was noted was the commercial names used in the fishing code for the regulation on the sizes of different species as these names correspond, for the most part, to a group of species of the same type or family presenting very similar morphological characteristics. However, on a biological level, and particularly with regard to the reproductive physiology, marked divergences distinguish the various species considered in isolation.

As the minimum landing size is determined based on biological criteria of a species, it does not make sense to use the commercial name (red sea bream, black sea bream, groupers, etc.). Nonetheless, it does facilitate comprehension, implementation of measuring by the fishermen and simplifies the control and surveillance of its application.

In addition, the researchers reminded the participants that, to ensure the sustainability of stocks, the minimum landing size must imperatively be superior to the size at first sexual maturity, size at which the fish first spawn and contribute to the renewal of the stock of the considered species.

The different results obtained by the CRODT in the frame of the study aimed at updating the minimum landing sizes. Each commercial

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name was broken down into its specific components. For each species the following descriptions were made: maximum size, size at first maturity, the safe margin for the latter and the proposed adequate minimum landing size (annex 7). The comparison between the scientific proposals and the values authorized by the fishing code revealed that many species of fish are caught before they spawn.

The situation for lobsters is different. Indeed, although both species of lobster reach their size of first sexual maturity at a cephalothoracic length of 15 to 16 centimetres, the regulation had set for these species a minimal size for capture of 20 centimetres. The research proposed a size of 17 centimetres for both species produced in the EEZ of Senegal, namely the royal spiny lobster (*Panilurus regius*) and the pink spiny lobster (*Palunirus mauritanicus*). However, maintaining the size already indicated in the regulation would guarantee an even more sustainable lobster production.

With regard to the coastal shrimp (*Penaeus notialis*), the research recommended maintaining the current regulation, but it is essential and urgent to ensure that the regulation is respected at the level of the small-scale estuary fisheries. Indeed, some devices used in small-scale fishing (such as the dragging net (killi in Wolof, the beach seine, the félé-félé - an artisanal fishing net with small meshes, etc.) tend to encourage intense fishing of juveniles and very young age groups of this species of high economic importance at the level of the estuary growing zones, which constitute the reservoirs of open water fisheries. The young shrimps migrate from the estuary zones on the coast towards the (industrial) fisheries of the open seas once they have reached a certain size (a certain age). Their intense production at the level of the growing zones has serious harmful effects on the renewal of the resource and the economy.

The research underlined that the notion of minimum landing size should be linked to the minimal authorized mesh size. Also, the weak selectivity of the fishing devices is largely responsible for the capture

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and mortality as a result of the fishing of immature fish. The debate that began following the inventory carried out by the research concluded on the established fact of the visible decrease in the size of piscatorial products at the landing points and markets.

The professionals maintained that almost all the large size fish of the coastal demersal species that are landed and sold on the local markets come from distant fishing zones situated mainly at the level of the countries of the West-Africa sub-region. The researchers also underlined the gradual deterioration of the traditional customs of the “*good fisherman*” who resolved not to cast his net to catch small sized fish. This behavioural decline probably resulted on the one hand from the scarcity of the resource that induced a “*race for fish*” on the part of all the fishermen and, on the other, the easy availability on the market of destructive fishing devices with a large capacity, such as the monofilament nets and, more recently, the net called “*peuil-peuil*” (artisanal fishing net with very small meshes) the usage of which is more or less generalized in Hann bay, particularly at the fishing location of Thiaroye.

For the crustaceans, although the research proposes a minimal cephalothoracic length of 17 centimetres, the participants unanimously opted to maintain the current regulatory size of 20 centimetres.

It is urgent to resolve the problem linked to the selectivity of fishing devices to avoid the capture of juveniles and reduce the discard. In light of this objective, a proposal was adopted to put in place a joint study project on the selectivity of shrimp trawls with a financial contribution from WWF international. In order to ensure that the common objectives of sustainability could be achieved, the need to put in place a real partnership between national institutions and NGOs was reiterated.

The surveillance insisted on the enormous difficulties encountered by agents in controlling the sizes of the species landed and the necessity of finding a lasting solution to the poor selectivity of the trawls to solve the thorny problem of discards and levels of incidental by-catch.

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The participants welcomed the work carried out in relation to the updating of the minimal catch sizes and recognized the need for a scientific approach to determine the minimal sizes for each species. However, to facilitate on the one hand the application of the measure by the fishermen and, on the other hand, the control in the field to ensure it is respected, it would be desirable to see under what measure the species of same commercial denomination presenting minimal sizes that are close can be regrouped.

Some participants brought to the attention of the group the need to involve hotelkeepers in the process relating to the application and control of regulatory minimal sizes. Indeed, statements from professionals have shown that hotelkeepers incite, with interesting price offers, the fishing of noble species that are immature (small stone bass, young red sea-bream) and small lobster or spendthrift for culinary reasons due to the fact that clients pay more for subjects that fit entirely on one plate. A definite craze in these activities has been pointed out in tourist regions of the Cap-Vert, Petite-Côte, Saloum Delta, Saint-Louis and Casamance.

It was consensually agreed that it is necessary to protect the fragile coastal zones where spawning grounds and nurseries of the species produced are located.

3.3.2 Fishing zones

To bring the participants up to date, the surveillance marked out the zone within which trawlers are banned along the Senegalese coast from Saint-Louis to Casamance and gave explanations relative to the different widths of the said zone in relation to the latitude and the configuration of the continental plateau (Annex 8). The course of the debate showed that the lack of knowledge of the position of this limit causes numerous difficulties for the small-scale fishermen. Indeed, in this zone the small-scale fishermen behave as if they were the exclusive owners of the maritime domain. The devices are laid without signalling equipment (radar reflectors) or worrying about passing ships (even in transit). This

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practice can also be found at the level of the pirogues active in a wider radius and fishing in the industrial fishing zones. This often leads to the loss of fishing devices and material and/or corporal damages, sometimes serious, thus exacerbating the conflicts. In most cases, the authorized vessels have destroyed the unmarked fishing devices outside the zone in which trawling is banned.

Although the trawlers carry 100% responsibility for conflicts that have occurred in the zone exclusively reserved for small-scale fishing, that responsibility is shared in the open seas. Indeed, the increasingly frequent use of automatic piloting on board trawlers, a mediocre level of watch and the almost complete absence of suitable lights on board the pirogues are frequent causes of collisions between pirogues and trawlers. What's more, to avoid their fishing areas being spotted by possible competitors, many fishermen do not signal the presence of their nets with buoys, thus increasing the risk of destruction of these devices by trawlers.

In view of the current state of the resources, the pertinence of maintaining the demarcation of fishing zones was questioned. The actors from the research asserted during the meeting that this preoccupation had already been taken into account in the list of priority actions established by the Department of Fisheries for 2003. The project for a study on the "*Impact of the extension of the zone forbidden to trawlers*" was entrusted to the CRODT. Its execution is underway, using geographically referenced information of the trawler fleets. The principal outcome expected from the study is the determination, for each category of industrial fishing boat, the biological and economical impact of the extension of the zone forbidden to trawlers to 7, 8, 9, 10 or 11 nautical miles.

The need to come closer to the coastal fringe has been noted among many industrials. Ships exceeding 300 gauge tonnage that normally have to fish beyond 15 nautical miles of the base line are increasingly requesting, and with more and more insistence, an authorization to fish within the 12 miles, as are the small units targeting the red mullet that would like their activity to be assimilated to an "*improved small-scale fishing*". It has been noted that there is a need to adequately define the zones that

DISCUSSION FORUM ON THE REGULATION
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need to be protected in view of creating marine protected areas and restoring the damaged habitats to encourage a better protection of the coastal spawning and growing areas. Following an enriching debate, the participants unanimously proposed an extension of the zone forbidden to trawlers in order to protect the fragile coastal area and reduce conflicts between small-scale and industrial fishing. Nonetheless, this request will only be satisfied once the impact study by CRODT on the extension of the zone forbidden to trawlers has been carried out.

As far as the Marine Protected Areas (MPA) are concerned, during the meeting WWF provided information on a participatory action programme that is to be carried out in view of defining and choosing a MPA. Sociologists and the beneficiary communities that are involved in the whole process of defining the sites and fixing the level of protection (areas totally or partially protected depending on the desire of the beneficiaries) put together a suitable questionnaire. The traditional system of protected areas used in Saint-Lucia for the rocky reefs for the fishing of noble species was cited as an example.

What emerges from the discussions is that the small-scale fishermen find it difficult to situate their fishing positions in relation to the limit of the zone forbidden to trawlers. This difficulty, that also affects the pirogues equipped with GPS, is the source of many conflicts with the industrial vessels.

Another problem that was evoked was the fishing of juveniles in Hann by small-scale fishermen on the one hand and tuna boat/canners on the other. The fishing of juveniles by small-scale fishermen is considered more harmful in the eyes of all. Indeed, the tuna fishermen keep the juveniles alive to use them as bate to capture tuna of regulatory size and economical importance whilst the small-scale fisherman directs his prohibited catch towards the transformation and sale for lucrative purposes much more harmful to the sustainability of the resource.

The participants approved the request to conduct the study on the extension of the zone forbidden to trawlers. They also attracted the atten-

FISHERIES AND THE ENVIRONMENT

tion of the authorities on the fact that, in principle, the red mullet trawlers may find themselves left ashore if they are included in this extension because of their restricted radius of action and limited means. To tackle this problem the possibility was suggested of allocating them a dispensation to operate for a limited period of time in the current fishing zone whilst freezing their numbers. The research recalled that the study underway intends to present scenarios of progressive extensions towards the high seas. It will then be the responsibility of the authorities to decide on the most adequate scenario for the sustainable development of the fisheries. Some participants maintained that the category of mullet fishermen is destined to disappear because of the development of the sector and the need for a sustainable development that includes protecting the fragile coastal area and creating protected zones (MPAs).

Some of the problems encountered by the fisheries sector also come from the fact that the money generated by fishing is not reinvested into the sector. Such a reinvestment could have been a solution for resolving the problem of the mullet fishermen, either by modernizing the units or inciting their disappearance from the fishing sector. Similarly, it is necessary to popularise the cards that determine the authorized limits and the involvement of the populations.

This is the context in which several reflection forum are currently underway to arrive at a convergence at the end of their mandate so that the structure put in place by some (local councils) integrates the development measures defined by others (resource access rights and concessions) under the supervision of the Department of Fisheries.

Conclusion

To complete the strategic approaches developed in the context of this report, it is necessary to also take into account certain prospective voices. Thus, for fisheries production, several management systems anticipated in the maritime fishing code had to be specifically apprehended in the course of their use in the Senegalese estuary fishing zones (Sine Saloum - Casamance). This is the case for cast nets and diverting gill nets, characteristically active and ambivalent in nature and adapted to production in estuaries.

Furthermore, some fishing methods not mentioned in the fishing code are strictly regulated, or even forbidden by the decree of 19 July 1965 and the law of 17 January 1970. These prohibitions in continental waters concern specifically the estuaries, rivers, and lakes and are meant to prevent (although for the time being this remains purely theoretical) fishing practices that involve purse seines, purse beach seines with meshes inferior to 30 millimetres and development of more than 150 millimetres, mullet nets of more than 30 millimetres, dragging net and, finally trawlers and killi (although these are commonly used in Sine Saloum).

The harmonization of regulatory measures concerning maritime fishing and fishing in continental waters seems fundamental for other reasons. Indeed, irrespective of the Cayar experience, several public harmonisation strategies could be carried out in the future, taking into account the regulations developed by the stakeholders in certain mixed fishing zones (Casamance, Sine Saloum). The advantage of these regulatory methods, if they are adjusted to the objectives of town and country planning, comes from a real coherence between sustainable management practices applied to all the resources (agricultural and natural) and a socio-economic framework that prevents any form of dissociation of aquatic and continental territories or between accessibility to and production and preservation of resources.

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More generally, the principle of an access right that is supervised or specifically established cannot be separated from the objectives of the public management of town and country planning, which calls for (i) a precise transfer of competencies towards the local communities, (ii) the existence of adapted forms of delegation in favour of the local fishing committees, (iii) taking responsibility for various stakes, namely real estate, administrative and fiscal, (iv) an effective regulatory convergence, especially of the different codes, (v) efficient coordination between the key ministries such as fishing and town and country planning, including finance.

The establishment of fishing concessions must be sufficiently supple to accommodate other situations, for example those specific to the diversity of the actors within the fishing sector, but such measures should also be included in the framework of a territorial administration, which raises other questions that need to be answered in relation to the development of the public domain, but this time in relation to other economical actors (post capture sector, agricultural sector, real estate and tourism developers)

The country study on the impact of trade-related policies in the sustainable management of piscatorial resources in Senegal, piloted by Enda in collaboration with UNEP and several national institutions, lead to satisfactory results that justified carrying out a second phase of implementation of the recommendations. This phase, piloted this time by the Ministry of Fisheries, always in collaboration with the same institutions, was concerned with the implementation of measures relating to the sustainable management and conservation of fisheries resources in Senegal. The results obtained in this phase constitute a major contribution towards the preservation of fisheries resources in Senegal, which are seriously threatened by the growing extroversion of the fisheries sector.

The implementation of this project shows the need to perpetuate the discussions and the information and exchange meetings with the stakeholders in the hope of seeing their involvement in the adoption of sustainable behaviour and practices in terms of production. This is the reason

CONCLUSION

why it is envisaged to make the discussion forum on the regulation of fishing permanent, beyond the duration of the project. The discussion forum underlined the importance of putting in place and developing an information system (training, communication, seminars, radio, television), making the local maritime fishing councils a reality, reinforcing and improving the fishing code in the most inclusive way possible, creating a follow-up committee that groups together the representatives of different categories of actors in the fishing industry and, finally, giving a mandate to the interprofessionals to share the results of the study with the stakeholders and gather their perceptions and suggestions. The interprofessionals will release these conclusions.

Today the administration has at its disposal a wide range of instruments for a better application of the fishing regulation and for regulating access to the resource for small-scale fishing. It must therefore carry out its responsibilities in preserving the importance of the fishing sector in Senegal and the interests of all the categories of stakeholders. Similarly, it would be pertinent to carry out prospective studies and create forum for discussion and the harmonization of fishing policies at other levels. In fact, an initiative similar to the country study carried out in Senegal has just been launched at the West-African sub-regional level, more precisely in six countries, in view of achieving more significant results for a better connection between trade-related policies and a sustainable management of fisheries resources.

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Annex I

List of participants at the discussion forum

1.	Pape Gora NDIAYE	ENDA
2.	Ibrahima SECK	DPM
3.	Abdoulaye SAMBA	FENAGIE PECHE
4.	Djiby THIAM	CRODT/ISRA
5.	Issa MBAYE	Direction Commerce Extérieur
6.	Ndiaga MBOUP	Chef Bureau Douane du Port de Pêche
7.	Moustapha DEME	CRODT/ISRA
8.	Marième Diagne TALLA	DPM
9.	Maguèye GUEYE	DPSP
10.	Aliou SALL	CREDETIP
11.	Alioune Badara DIAGNE	CNPS
12.	Assane DIOP	CNPS
13.	Mamadou Diop THIOUNE	UNAGIEMS/CIPA
14.	Ousmane NDIAYE	DPM
15.	Chérif Younoussé NDIAYE	DPM
16.	Marie DIOKH	ADPES
17.	Alassane SECK	FENAGIE-PECHE

Annex II

Banned devices in maritime waters under Senegalese jurisdiction

Code of 1998
Small-scale fishing
Fishing with the use of explosives
Monofilaments or multifilament gill nets
Industrial fishing
Twin trawlers
Straight nets for fish or lobster
Diverting gill nets for tuna
Trawlers exceeding 400 gauge tonnage for coastal shrimp fishing
CODE OF 1987
Industrial fishing
Sardine trawlers exceeding 1500 gauge tonnage
Deep-sea fishing
Autonomous or non autonomous aqua lungs
Possession of a aqua lung and fishing device such as a spear, a gun or other fishing arm

ANNEXES

Annex III

Evolution of mesh sizes of small-scale fishing devices authorized in maritime waters under Senegalese jurisdiction

Device	Code of 76	Code of 87	Code of 98
Small-scale fishing			
Passive gear			
○ Bottom gill nets	130	100	100
○ Surface gill nets	50	50	50
○ Shrimp nets	12	24	24
Active gear			
○ Beach seines	20	40	50
○ Sliding purse seines	22	28	28
○ Surrounding gill nets	–	60	60
○ Filtering shrimp nets	12	24	24
○ Dormant shrimp nets	–	–	24
○ Cast nets	20	40	40
Industrial fishing			
Sliding devices			
○ Diverting purse seine	20	28	28
○ Diverting purse seine with live bate	7	16	16
○ Diverting tuna net	140	140	
Dragging nets			
○ Classic trawler net	70		70
○ Coastal shrimp tawler	20		50
○ Bottom trawler	20		40
○ Pelagic trawler	70		50
○ Hake trawler	–	–	70

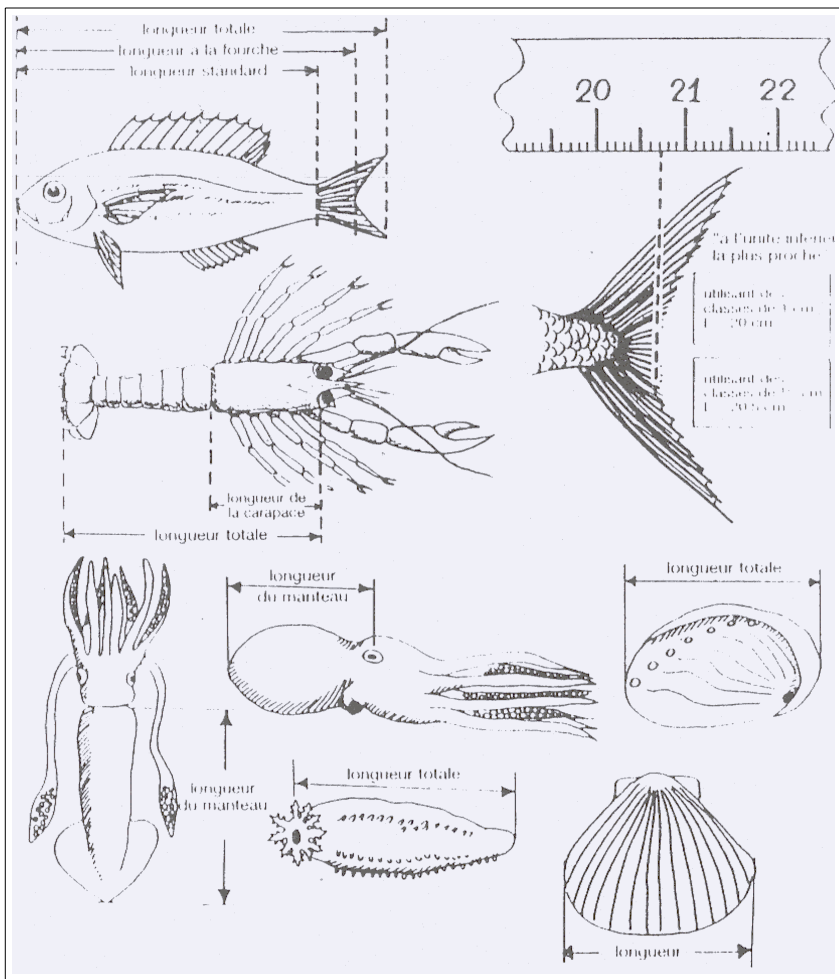
Annex IV

Authorized sizes and weights for selected species

Species	Minimum landing size/weight
Fish	
○ Sardinella	12 cm
○ Ethmalosa	15 cm
○ Chinchard	15 cm
○ Mackerel	12 cm
○ Grouper	20 cm
○ Mullet	10 cm
○ Tongue sole (Senegal)	15 cm
○ Red sea bream	10 cm
○ Albacore	3.2 kg
○ Tunny	3.2 kg
Crustaceans	
○ Royal spiny lobster	20 cm
○ Pink spiny lobster	20 cm
Shrimp	
○ White shrimp	200 individuals per kg
Molluscs	
○ Octopus	300 g gutted and 350 g not gutted
○ Oysters	Wide axe 3 mm

Annex V

Types of measurements effected on piscatorial products



Annex VI

Scientific proposals for minimal catch sizes for selected species

Common name	Scientific taxon	Ouolof/Lebou common name	Maximum size (cm)	Size at 1st sexual maturity (cm)	Margin of variation of size at maturity	CRODT PROPOSALS	
						Minimal size (cm)	Minimum weight
FISH							
Sardinella							
Round Sardinella	<i>Sardinella aurita</i>	Yaboi meureuk	31.0	17.7	10.8 19.4	≥ 20.0	
Madeira Sardinella	<i>Sardinella maderensis</i>	Yaboi tass	37.3	21.6	16.2 29.0	≥ 20.0	
Ethmalosa	<i>Ethmalosa fimbriata</i>	Obeu	45.0	27.0	20.1 36.1	≥ 21.0	
Mackerels							
Horse mackerel	<i>Trachurus trachurus</i>	Dial bou gnoul	70.0	30.2	22.5 40.4	≥ 23.0	
Cumene horse mackerel	<i>Trachurus trecae</i>	Dial bou gnoul	35.0	26.2	19.5 35.0	≥ 20.0	
False scad	<i>Decapterus ronchus</i>	Dial	60.0	25.6	19.1 34.4	≥ 20.0	
Groupers							
Grey grouper	<i>Epinephelus aeneus</i>	Thiof	120.0	68.8	51.4 92.2	≥ 55.0	
Yellow grouper	<i>Epinephelus guaza</i>	Kauthieu	150.0			≥ 55.0	
Red grouper	<i>Epinephelus caninus</i>	Rour	157.0	79.8	59.6 106.9	≥ 80.0	
Blue spotted grouper	<i>Cephalopholis taeniops</i>	Kelle	70.0	39.1	29.2 52.4	≥ 35.0	
Painted grouper	<i>Serranus scriba</i>	Kelle	36.6	19.4	14.5 26.0	≥ 20.0	
Mottled grouper	<i>Mycteroperca rubra</i>	Yatante	100.0	53.5	40.0 71.7	≥ 45.0	
Mullet	<i>Pseudupeneus prayensis</i>	Ngor sikim	55.0	31.6	23.6 42.3	≥ 20.0	

ANNEXES

Annex VI (continued)

Common name	Scientific taxon	Ouoló/Lebou common name	Maximum size (cm)	Size at 1st sexual maturity (cm)	Margin of variation of size at maturity	Minimal size (cm)	Minimum weight
Tongue sole							
Tongue sole (Senegal)	<i>Cynoglossus senegalensis</i>	Tapalé	66.0	43.8	32.7 58.6	≥ 35.0	
Tongue sole (Guinea)	<i>Cynoglossus monodi</i>	Tapalé	40.0	23.8	17.8 31.9	≥ 20.0	
Tongue sole (Canaries)	<i>Cynoglossus canariensis</i>	Tapalé	60.0	30.5	22.8 40.9	≥ 30.0	
Tongue sole (Nigeria)	<i>Cynoglossus browni</i>	Tapalé	40.2	23.9	17.9 32.0	≥ 25.0	
Albacore	<i>Thunnus albacares</i>	Wakhandar	280.0	100.4	74.9 134.5		≥ 3.2 kg
Tunny	<i>Thunnus obesus</i>	Wakhandar	250.0	112.9	84.3 151.3		≥ 3.2 kg
Skip jack	<i>Katsuwonus pelamis</i>	Wakhandar	108.0	42.3	31.6 56.7		≥ 3.2 kg
Sea bream							
Red banded sea bream	<i>Sparus auriga</i>	Yéneu	60.0	44.0	32.8 58.9	≥ 40.0	
Blue spotted sea bream	<i>Sparus caeruleostictus</i>	Waragne	65.0	24.0	20.0 28.0	≥ 25.0	
Southern common sea bream	<i>Sparus pagrus africanus</i>	Kibaro bou gnoul	45.0	20.5	16.7 25.6	≥ 21.0	
Pandoras							
Axillary sea bream	<i>Pagellus acarne</i>	Youfouf	36.0	17.7	13.2 23.7	≥ 18.0	

FISHERIES AND THE ENVIRONMENT

Annex VI (continued)

Common name	Scientific taxon	Ouolof/Lebou common name	Maximum size (cm)	Size at 1st sexual maturity (cm)	Margin of variation of size at maturity	Minimal size (cm)	Minimum weight
Dentex							
Large eye dentex	<i>Dentex macrophthalmus</i>	Mbagne mbagnère	65.0	17.0	16.0 18.0	≥ 18.0	
Angola dentex	<i>Dentex angolensis</i>	Mbagne mbagnère	37.0	24.3	18.1 32.5	≥ 25.0	
Congo dentex	<i>Dentex congolensis</i>	Mbagne mbagnère	50.0	29.0	21.7 38.9	≥ 25.0	
Canary dentex	<i>Dentex canariensis</i>	Kibaro ngokh	50.0	23.0	22.0 24.0	≥ 25.0	
Large pink dentex	<i>Dentex gibbosus</i>	Diarègne	85.0	55.5	41.4 74.4	≥ 50.0	
Hake							
senegalese hake	<i>Merluccius senegalensis</i>		81.0	45.2	33.8 60.6	≥ 35.0	
Tropical African hake	<i>Merluccius polli</i>		90.0	35.2	26.3 47.1	≥ 35.0	
Croakers							
Law croaker	<i>Pseudotolithus brachygnathus</i>	Ngoukeu	115.0	55.9	41. 75.4	≥ 43.0	
Bobo croaker	<i>Pseudotolithus elongatus</i>	Dioto	60.0	25.8	19.3 34.6	≥ 26.0	
Cassava croaker	<i>Pseudotolithus senegalensis</i>	Feuteu	100.0	43.2	32.3 57.9	≥ 35.0	
Longneck croaker	<i>Pseudotolithus typus</i>	Tounoun	100.0	54.6	40.7 73.1	≥ 43.0	

ANNEXES

Annex VI (continued)

Common name	Scientific taxon	Oulof/Lebou common name	Maximum size (cm)	Size at 1st sexual maturity (cm)	Margin of variation of size at maturity	Minimal size (cm)	Minimum weight
CRUSTACEANS							
Lobster							
Royal spiny lobster	<i>Panulirus regius</i>	Soum		15.0		≥ 17.0	
Pink spiny lobster	<i>Palinurus mauritanicus</i>	Soum		15.0	14.0 16.0	≥ 17.0	
Spendthrift							
Cigale rouge (French)	<i>Scyllarides herklotsi</i>						
Grande cigale (French)	<i>Scyllarides latus</i>						
White shrimp	<i>Penaeus notialis</i>	Sipakh					≥ 200ind/kg
Crabes							
Deep sea red crab	<i>Geryon maritae</i>	Dioung Khoop				≥ 12.0	
Blue crab	<i>Portunus validus</i>	Dioung Khoop	19.0			≥ 15.0	
Crabe bicorne (French)	<i>Callinectes amnicola</i>	Niahar	15.0			≥ 12.0	
Crabe matbré (French)	<i>Callinectes marginatus</i>	Niahar	10.0			≥ 07.0	

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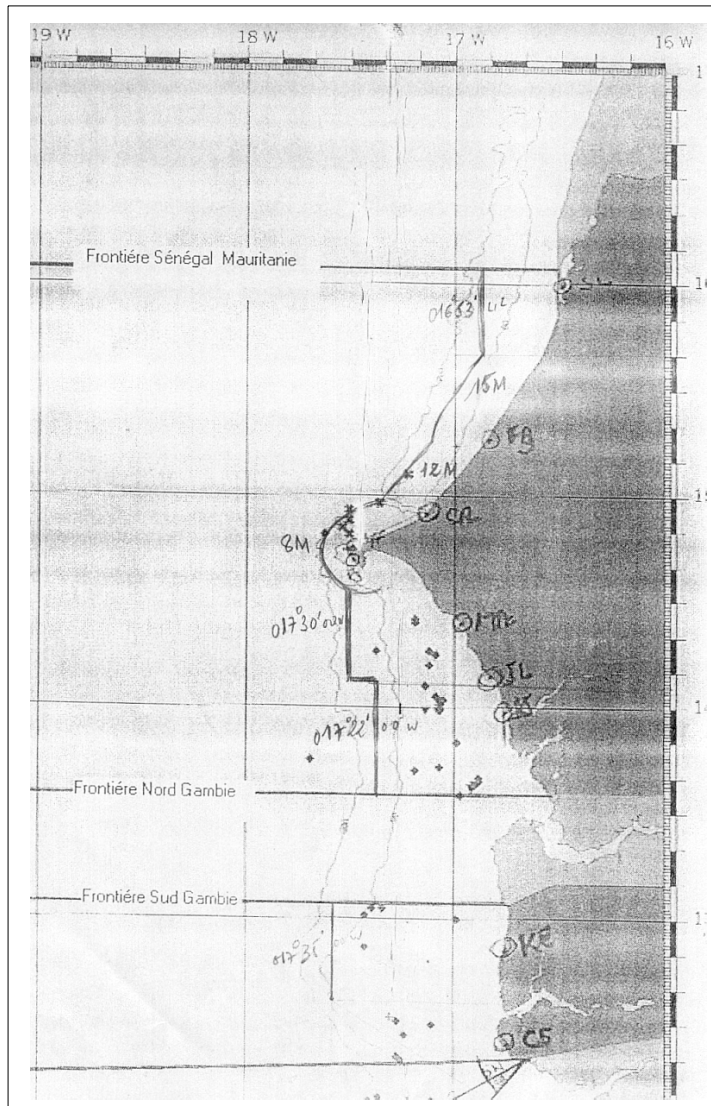
Annex VI (continued)

Common name	Scientific taxon	Oulol/Lebou common name	Maximum size (cm)	Size at 1st sexual maturity (cm)	Margin of variation of size at maturity	Minimal size (cm)	Minimum weight
Oysters	<i>Crassostrea gasar</i>	Yokhoss	≥ 120 mm			≥ 60.0 mm	
Cuttlefish	<i>Sepia officinalis</i>	Yeureudeu		♀ 13.5		≥ 15.0	
Squid							
Calamary	<i>Loligo vulgaris</i>	Calmar		447.0 g			≥ 450.0 gr
Octopus – non gutted	<i>Octopus vulgaris</i>	Yarankha		♀ =85 ♂ =40			≥ 450.0 gr

ANNEXES

Annex VII

Fishing zones



FISHERIES AND THE ENVIRONMENT

Annex VIII

Participants by principal site and secondary site

<i>Principal site</i>	<i>Other secondary sites concerned</i>	<i>Participants</i>
Soumbédioune		29 participants
Yoff		25 participants
Ouakam		List not communicated
Ngor		List not communicated
Hann		31 participants
Thiaroye		List not communicated
Mbao		List not communicated
Rufisque		12 participants
Yenne	Niagal, Yenne Todde, Nditakh, Toubab Dialao	66 participants
Mbour		18 participants
Joal	Pointe Saréne	16 participants
Saly Portudal		16 participants
Fass Boye		22 participants
Mboro		28 participants
Lompoul		9 participants
Guet Ndar		List not communicated
Goxu Mbaath		14 participants
Ndangane	Fimela	39 participants
Djifère		47 participants
Foundiougne	Fambine, Fayaco, Féfir	14 participants
Ziguinchor	Goudomp, Kafountine, Cap Skirring, Elinkine	List not communicated
Cayar		14 participants

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