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ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

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Socio-economic and Environmental Impacts of Senegalese Fishery Support Mechanisms

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Socio-economic and Environmental Impacts of Senegalese Fishery Support Mechanisms

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Introduction

Government support to the Senegalese fishery sector can be divided into several major periods with varying impacts on the economic, social and environmental sustainability of the fisheries. During the first period, say, from Independence to the end of the 1970s, the government supported the sector actively by promoting industrial fishing development projects. However, this policy failed due mainly to a dynamic small-scale fishing and could not be pursued anyway because of a context characterised by a crisis in government finance precipitated by debt. Paradoxically enough, these subsidies, which are supposed to have the most negative impact on the environment finally turned out to have little effect on the sector. In principle, support to the capture component of fishing by subsidising boat construction normally produces a direct effect on stock balance. Stronger capitalisation was, indeed, not the result of global supportive measures, but rather the direct objective sought through interventionist projects. Even then, for disequilibria to become apparent, equipment yield first had to be improved so as to be able to cope with national and international competition. Obviously, this was not the case notably because with much less proportionate support, small-scale fishing remained competitive enough to slow development of the industrial sub-sector. To the extent that the projects implemented in this respect were not sustainable enough to produce consistent social and environmental changes. At best, their main effect was rather – though negative – of an economic nature, as the successive failures of government interventionism led to investments misallocation at the national level.

During the second period, which roughly started in the early 1980s, government support first declined as a result of structural adjustment and also “shifted” from direct interventionism on capture component to export support promotion mechanisms. The free zone and the duty-free status conferred on export companies, the Lome Agreement, export subsidy, fishing agreements and devaluation greatly contributed to the progressive anchoring of the sector to external markets. While it

reduced and changed the nature of its interventions, the government also paid more attention to the sector, as it then took actions more favourable to its development engine that is, small-scale fishing. It set up a number of mechanisms in support of its modernisation, which was up to then, handled by the fishermen themselves. Support to pirogue motorization and to the introduction of new fishing gears (purse seine) were part of this new approach. The results of these policies in terms of fishery sustainability are unclear. Though, the promotion of small-scale fishing – hence of the sub-sector, which, *a priori*, is socially and environmentally most favourable – may be appraised positively. In principle, small-scale fishing has, indeed, the advantage of being labour-intensive, catering for the populations' animal protein needs and selling the bulk of its production without any losses. Notwithstanding the fact that it was difficult to distinguish between the impacts produced by stronger external demand, innovations by the fishermen and public intervention, the 1980 and 1990 decades corresponded to the most booming period of small-scale fishing. However, a closer analysis reveals that the booming small-scale fishing did not produce all the expected results in terms of fisheries sustainability.

While small-scale fishing clearly contributed much to reduced unemployment by employing 15% of the working population, it failed to solve the main problems caused by growing exports of sea products that is, the likely biological depletion of exports species and shortage of cheap protein supply to the populations. In fact, many small-scale fishermen have shifted to the capture of high market value species to the extent of supplying about 60% of export units' needs of raw materials.

Analysing the global relevance of government support in terms of the sustainability of a given activity is one thing, another is to compare it to the social functions discharged by the said activity. It is these functions that determine the framework of constraints outside which it would be difficult to adopt durable growth policies. Therefore, it is advisable, in studying the socio-economic and environmental impacts of Senegalese fishery support mechanisms, to take their multifunctional nature into consideration. A specific feature of this sector is that it can meet at the same time potentially divergent objectives, which are of crucial interest to the Nation altogether. The fishery sector contributes significantly to the country's foreign exchange, food security and employment policies. Whereas, these three mainstays are so important

that none of them can be sacrificed for some abstract sustainability. This is an obvious limit to any approach to subsidising in which the focus is on its environmental consequences despite its contribution to some strategic areas of national development. Inversely, the threat exerted by some support mechanisms on these areas and even on other equally strategic fields, rather pleads for the need to reach some durable compromises. *Mutatis mutandis*, the study on Subsidising Senegalese Fisheries is not limited to the analysis of its environmental consequences; it also looks into its positive or negative contribution to the durable growth of the sector within the constraint framework determined by its social functions.

I. Up to the 1980s, industrial and later small-scale production benefited from direct support

Under its achievement programme, the government developed a policy designed to gradually substitute small-scale fishing by an industrial one. In this connection, attempts were made to build up a national tuna fleet and to introduce new types of coastal pelagic and demersal fishing. As part of the tuna industry, *the Société sénégalaise d'armement à la pêche (SOSAP)* was established in 1962 and became operational as from 1965. As a result of several setbacks partly due to inappropriate technical choices and ineffective management and also to tougher competition on the international market and to the fact that developed countries were subsidising their fisheries, this company was liquidated in 1976 after having absorbed most of the government funding destined to the fisheries. Demersal fishing faced the same problems, notably implementation of trawl fishing project that should have logically led to the substitution of traditional pirogues (Kebe, 1991) by semi-industrial boats. This effort also failed because trawl fishing turned out to be unable to compete with small-scale fishing¹. Alternatively, the government tried to model small-scale fishing on semi-industrial one. Another illustration of this effort is the project designed to modernise coastal pelagic fishing and to replace traditional boats by industrial sardine boats. This effort was not successful either. Though blamed on managers and crews' (recruited among traditional fishermen) inexperience, the main cause of the failure,

¹ It is noteworthy that the productivity of small-scale fishing is so high despite the fact that its capitalisation is lower than that of semi-industrial fishing.

however, seems to be linked to industrial fishing's inability to compete economically with small-scale fishing.

Although the Government of newly independent Senegal insisted time and time again that it was interested in small-scale fishing, industrial fishing, however, benefited most from the successive development plans of the sector. The first two 4-year plans were devoted to building a tuna fleet, the third one, clearly favoured industrial fishing. By allocating only 14% to the small-scale fishing sub-sector, the fourth plan increased the latter's share of funds earmarked for the sector (Domingo, 1982).

Nonetheless, while industrial projects were implemented in succession, pirogue fishing was considerably modified and the fishermen quickly adjusted to the new operating conditions. These successive adjustments enabled small-scale fishing to increase significantly its yield and hence its production. Production rose exponentially from tens of thousand tons in the 1970s to about 350,000 in 1997 (in comparison, industrial fishing stagnated at 130,000 tons). Of course, the government could not ignore these successful results and decided then to focus its interventions on the small-scale fishing sub-sector, more specifically, on equipment and marketing.

As regards equipment, the government first tried to generalise the use of motors by conditioning its lending to prior structuring of fishermen into co-operatives purported to manage allocated funds. The debt repayment crisis that occurred by the end of the 1960s precipitated the failure of the first co-operatives. The problem of this first stage was solved by writing off outstanding loans, which represented without any doubt the greatest subsidy ever granted (nor programmed) to small-scale fishing. The second stage or motorization led to the establishment of the *Centre d'Assistance à la Motorisation des Pirogues (CAMP)* in 1972. The Centre was put in place with the Japanese technical assistance and was more likely to meet the conditions of financial equilibrium. Long convinced that motors were useful, fishermen undertook to generalise its use. It was the existence of new resources rather than the reorganisation of co-operative systems that explains the dissemination of this technology. The government pursued its intervention with the introduction of purse seine. Following the successful demonstration of purse seine efficiency by FAO in 1973, purse seine

units increased rapidly from 120 in 1977 to 230 in 1981, to 265 in 1983 and to 303 in 1989.

With regard to support to marketing, the creation of the Dakar-Marée project (1962), a sale co-operative, was the repetition of the 1954 Coopmer venture. It was also a failure in trying to organise fish and seafood wholesalers who found it more attractive to operate outside the administered system set up by the government. In 1978, the CAPAS (*Centre d'Assistance à la pêche Artisanale du Sénégal*) project was designed to market fish through fishermen's co-operatives. Given the small size of the project, it was not expected to process more than 10% of landings, hence it could not have much influence on their prices. Another aspect of the project, which was to supply the country's inner regions from three centres: Joal, Kayar and Rufisque, was hindered by the high maintenance costs of the ice chain. On the whole, the project had to face the same old problems experienced by previous ones: incorporation of fishermen in an administered organisation, relationship between the organisation and the fish and seafood wholesalers, price offers too low for the fishermen (Chauveau, 1984). The CAPAS marketing operation was finally halted in 1987. The centres had to be disposed of after having been left to the joint management of fishermen's co-operative unions. The government is now in the process of valuing the assets before putting them up for sale.

The government then turned to the building of secondary ports and roads, but it was still endogenous changes that fuelled expansion: structuring of fish trade allowing more flexibility in marketing, booming traditional processing, technical innovations...

II. Contemporary period: support to small-scale fishing and export support mechanisms

After giving its preference to industrial production, the government gradually turned to supporting the small-scale fishing sub-sector first through direct interventions in favour of the capture component and later through notably export marketing support mechanisms. So far, the government's direct and indirect financial assistance to fishing can be summarised as follows:

- □ support to modernisation through creation of infrastructures (fishing wharves, Central Fish Market), a policy of tax reductions on fishing equipment (motorization), subsidised fuel and establishment of institutions designed to finance the sector;
- □ support to marketing (support to fish trade, subsidised exports, devaluation, Lome Agreement, upgrading to international standards, duty-free exporting companies, fishing agreements) for improved competitiveness and stronger penetration of Senegalese sea products into international markets;
- □ support to small-scale processing.

A. Support to modernisation

1) The policy of tax reductions on motors and fishing engines

Started in the 1950s, the dissemination of outboard motors in small-scale fishing took a final booming turn in 1965 with the sale of motors duty-free and on credit by CAMP. Motorization produced a considerable impact both technically and economically. Motors widely broadened the areas of intervention of small-scale fishing by enabling it to reach very remote fishing zones, which were until then inaccessible. They sharply reduced travel time thereby increasing substantially fishing time. The use of motors favoured migration of Senegalese small-scale fishermen along the coast of the West African sub-region and development of distant fishing. The introduction of motors in small-scale fishing was, unquestionably, the main factor that encouraged the broadening of pirogues in order to adapt them to new fishing techniques such as purse seine.

So far, it is presumed that motorization has reached about 90% and that all pirogues likely to be motorized under satisfactory yield conditions have done so. By the way, the government granted CFAF 2.01 billion in tax reductions in an effort to encourage purchase of outboard motors.

Despite government subsidy, fuel is by far the most important element of motorized fishing units' intermediary consumables and accounts for more than 50%. Thus, in a move to save on energy, the government called on Japan to design diesel motors that

are adapted to the operating conditions of Senegalese small-scale fisheries. In this connection, the dieselisation project was launched in 1994 under Japanese non-refundable financial co-operation. A hundred (100) 27 horsepower diesel motors were put at the disposal of CAMP for sale to fishermen. This project was seriously constrained by technical limitations and weak motor power, shortages and high prices of spare parts, difficult supply of diesel oil benefiting from tax reductions, lack of specialised motor mechanics and by an inappropriate after-sales service.

The volume of coastal resources made up of small coastal pelagics (sardinella, scads, *pelons...*), which has hardly been exploited so far by small-scale fishing, the existence of strong demand for cheap fish, the successful experience about the introduction of surrounding gill nets in the 1960s, encouraged the government to disseminate purse seine. Following the conclusive tests carried out with the assistance of FAO in the early 1970s, this new technique became widespread from 1973. After the motorization stage, this was the second major technical breakthrough experienced by pirogue fishing since 1960 with quite many consequences:

- □ it induced unprecedented levels of landings with the development of fresh fish marketing and small-scale braising (*kéthiakh*) industry especially along the *Petite Côte*;
- □ it induced technological dissemination through construction of large pirogues capable of carrying great quantities of catches (up to 20 tons).

Renewal or purchase of purse seine yielded about CFAF 0.6 billion in annual tax reductions.

2) Subsidised fuel

Subsidising fuel is a decisive factor of equipment modernisation. Fuel subsidy allowed fishermen to use more efficient motors, to increase pirogue sizes and to extend their sea trips to new fishing zones. It contributed to a substantial reduction in the operating expenses of fishing units, which is expected to maintain the price of fish landings at a level compatible with the purchasing power of Senegalese populations. However, the fact that small-scale fish catches are export-oriented raises doubts about who government support finally benefits other than a few industrialists and the foreign consumer.

Fuel subsidy to only small-scale fishing units rose from less than CFAF 2 billion in 1986 to over CFAF 6 billion in 1998 (See Table I).

3) Activity financing policy

* Small-scale fishing: the *Caisse Nationale de Crédit agricole du Sénégal (CNCAS)*

Conceived as a development bank since its creation in 1984, CNCAS contributes greatly as such to the financing of all rural functions and activities including fishing. CNCAS was closely involved in the financing of the fishing sector first from its own equity and later through managing the credit lines of some development projects touching on small-scale fishing. These include the credit components of the *Petite Côte* Small-scale Development Project (PAPEC), the *Ziguinchor* Small-scale Development Project (PAMEZ), which later became *Casamance* Small-scale Fishing Professionals Support Project (PROPAC), the Mutual Benefit Savings and Credit Company Support Project in Senegal (PAMECAS), the funds generated under the latest fishing agreement concluded with the European Union in support of the small-scale fishing sub-sector.

However, CNCAS' intervention in favour of small-scale fishing is lacking in many respects despite efforts made since its inception. It is inappropriate as reflected by its limited portfolio, which never exceeded an outstanding amount of CFAF 3.2 billion in ten years of interventions in the sector. The difficulties encountered included:

- □ restrictive access to credit: borrower self-financing requirement is perceived as discriminatory and the 12.5% annual interest rate instituted is considered too high compared to the interest rate charged on the credit line granted to CNCAS (less than 4%);
- □ problems of loan repayment recovery due to producers' insolvency, absence of permanent guarantees, the after effects of co-operative credit which preceded CNCAS's involvement, fund releases during irrelevant periods (outside agricultural campaign), low level of fishermen's banking practices.

* Industrial fishing

The Economic Promotion Fund (FPE) established in 1991 as part of the national private sector promotion policy is based on three instruments:

- □ an economic promotion fund, which is a credit line of CFAF 39 billion put at the disposal of the Senegalese government by the African Development Bank (ADB) for refinancing banks meant for Small and Medium-scale Enterprises (SME) (amount higher or equal to 70% of project cost), maximum interest rate of 13%; opening fee of 1% and maximum loan repayment period of 15 years with a 5- year grace period.
- □ a guarantee fund (to cover against risks involved in lending to SME);
- □ a participatory loan fund (to remedy entrepreneurs' insufficient equity) of CFAF 3 billion set up by the government.

The industrial fishing projects financed through FPE are relatively limited in number compared to the other sectors of economic activity: about 8% or CFAF 3.5 billion between 1991 and 1995. Besides, the financing accounted for about 40% of the investment programme carried out in this respect, which reflected a high level of self-financing (60%) and constituted a clear indicator of the difficulties encountered by fishing companies in financing their own investment needs.

4) Building of fishing wharves

Apart from Hann, Joal and Rufisque, the landing areas of the major small-scale fishing centres do not offer sufficient hygienic conditions. Fish are landed on the sandy ground while waiting for buyers thereby seriously increasing the risk of contamination. Fish traders do not have adequate parking lots for their trucks and for packaging their products.

Given these constraints, the government launched a landing wharf building programme in the main sea fishing centres (Saint-Louis, Kayar, Yoff, Soumbédioune, Toubab Dialao, Yenne...). In this perspective, the construction of concrete display areas where fish would be sold would be a first step towards the establishment of real auction markets just as the construction of parking lots and loading areas for fish

traders' vehicles would improve the hygiene of fish freezing and packaging operations.

5) Central fish market (CFM)

The Central Fish market was created in 1992 and became operational in 1993. At a cost of CFAF 3.117 billion, it was jointly financed by Japan (90%), the Government of Senegal (7%) and the former Urban Community of Dakar (3%). The market was constructed in an effort to improve the quality of marketed products. With three ice plants, three warehouses and three cold rooms, the CFM ensures conservation of unsold products and provides ice to fish traders at competitive prices. As a central market, it facilitates supply of secondary markets and contributes to regulating fish supply in the Dakar region.

The CFM was expanded in 1998 at a cost of over CFAF 3 billion financed by Japan (99%) and the Government of Senegal (1%).

B. Support to domestic and external marketing

1) Fish trade centres and ice chain

Up to the mid 1970s, investments in small-scale fishing were allocated in priority to the development of upstream fishing activity. On the contrary, in the early 1980s, investments were made to finance large-scale projects designed to improve on marketing, because it was argued, fresh fish marketing suffered from some weaknesses:

- the fact that there are no conservation infrastructures on the beaches weakens the fisherman's position vis-à-vis the fish trader and affects fish quality right from the beginning of the distribution network. This was the rationale for the CAPAS project (*Centre d'Aide à la Pêche Artisanale Sénégalaise*);

- inadequate guarantees of small-scale fish and seafood wholesalers in terms of fish quality and regular market supply. This was the rationale for the ice chain project.

2) Duty-free export company

The status of a duty-free export company was instituted by law n° 95-34 dated December 29, 1995. The main reason behind this law was to boost the development of Senegalese exports with a view to plugging the deficit in the balance of trade through foreign exchange gains and constitution of local value-added. Other objectives included promoting salaried jobs and speeding up the country's industrialisation.

The duty-free export company is an export-oriented industrial or agricultural concern. The fish sector is included in agricultural activities. Instituted for a renewable 20-year duration, the duty-free export company can be located anywhere on the national territory. This status confers the following main advantages:

- exemption from all rights and taxes levied on entry or exit of capital goods, raw materials, finished or semi-finished products;
- tax exemption on value-added, customs stamps, registration and stamp duties and licences...

The main requirement was to achieve a minimum of 80% of export turn over, the main advantage being to pay tax on industrial and commercial profits (ICP) at a reduced rate of 15% (instead of 33%).

3) Export subsidy

Export subsidy is a national marketing policy aimed at favouring the penetration of domestic products into international markets. Such subsidy added to the value-added already achieved by the companies to remunerate production factors. It allowed the exporter to offer products at competitive prices, which do not relay factor relative surcharges recorded in the country. This is an option made to protect some areas of

activity the socio-economic counterparts of which are deemed at least equivalent to its cost in so far as government spending is concerned.

Once established in 1980 for agricultural products in general, subsidy was extended to tuna in 1993 and increased from 10% to 15%. System recasting in 1986 introduced industrial valued-added criteria in the determination of its amount. It extended the base to all types of sea products and raised subsidy amount to 25%. For example, export subsidies to trawler industry during the 1991/1992 fiscal year amounted to CFAF 12 billion.

In the aftermath of the devaluation of the CFA franc and given the looming prospects for the recovery of sea industry, export subsidy was cancelled by presidential decree in March 1994.

4) Devaluation of the CFA franc

The franc zone member countries' structural adjustment policies (SAP) then turned out not to be very efficient. This limited efficiency was even confirmed in 1989 both by the IMF which suspended its lending and France which refused to support structural adjustment any longer without any prior agreement between franc zone countries and the Bretton Woods institutions. In this connection, it was decided to devalue the CFA franc on January 11, 1994.

Development partners who recommended this monetary adjustment were aware that important stakes were involved in devaluation viz. boosting exports and restoring franc zone's credibility. This is why they pledged to increase their support to franc zone countries in their efforts to promote growth and to bring the distorted effects of devaluation under check. This commitment was materialised by the adoption of follow-up measures.

In this context, donors paid special attention to the fishing industry as it seemed to reconcile food security and exports. However, devaluation especially translated into a sort of disconnection between domestic and international markets, to the extent that, in practice, boosting exports prevailed over food security concern. The prospects for

making huge profits on international markets actually led operators to concentrate on exports to the neglect of meeting domestic demand.

5) The Lome Agreement

From 1962, the different aspects of the Lome Agreement concluded by the European Union and ACP countries (Africa, Caribbean and Pacific) allow for duty-free imports of African products – notably sea products – to Europe. The already heavy dependence of these countries on the European market grew worse. Senegal is not an exception, all the more so as its colonial history had made of Europe and particularly France, the main destination of its exports. Today, besides the massive presence of European capital in the industrial fishing sub-sector, more than 60% of Senegalese exports of sea products are destined to the European Union.

6) Fishing agreements

Senegal concluded several fishing agreements with foreign countries and far more important are those concluded with Japan, and the European Union. The former mainly involve tuna while the latter concern demersal, and of late, coastal pelagic fishing. The agreements signed with the European Union are more in focus because they involve endangered or locally consumed species (strategic species for food security), very important quantities and financial compensations. All these agreements constitute disguised subsidies since the bulk of resource access price is borne by the national authorities of the fleet holding a fishing licence. The dues paid by the European boat owners covered by the agreements thus represent only about 10% of resource access price, the difference corresponding to the financial compensations paid by the European Commission. This situation enables fleets which otherwise would have probably been forced to withdraw from a very competitive sector in Europe, to make their outfit profitable in African waters.

7) Policy of upgrading to international standards

French co-operation, in collaboration with the Senegalese authorities, has initiated, as part of the “Fishing Industry Restructuring Support Project”, a policy designed to upgrade export companies and industrial fishing fleet to European standards (ships and freezers), as the European market is currently the main destination of sea products. About thirty companies from this sector benefited from a CFAF 2.7 billion subsidy to finance up to 30% of their investments.

C. Support to small-scale processing

Despite the economic and social importance of small-scale processing (capture valorisation, supply of animal protein, employment, foreign exchange...), it still uses rudimentary techniques, which do not valorise its products very much. An evidence of this is that most of the techniques used to process the main products of small-scale fisheries and particularly braising, is done on the ground, causing, inter-alia, production losses and poor quality products.

Various government institutions experimented the Chorkor and Parpaing ovens in an effort to remedy these weaknesses. All these projects aim at the same goal that of improving the quality of processed products, extending their conservation period and developing new products with non-valorised species.

The use of Chorkor oven has a number of constraints for fish processors. The products obtained through this technique are unknown to the Senegalese consumer traditions; they are mainly meant for export. To the extent that only foreign communities have adopted this technique. Besides, these ovens have very limited production capacity (50% lower than that of traditional method) and the long smoking operation period (three months) requires strict supervision. Not only manufacturing costs are rather high, this technique also uses very scarce and relatively expensive hard wood as combustible. Rack maintenance is also expensive. This notwithstanding, these ovens make it possible to develop new products with non valorised species and to produce good quality products (homogenous smoking, good product colouring, less bacterial contamination, longer conservation period...).

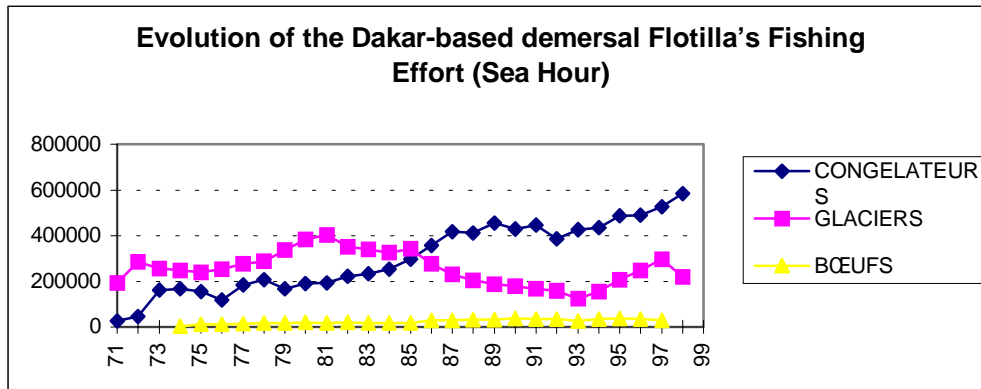
On the contrary, Parpaing oven technique produces the same product as that of the so-called traditional methods (*Kethiakh*) and poses no outlet problems in Senegal or in some of the neighbouring countries. It has greater production capacity (40% and 70% higher than those of traditional method and Chorkor oven technique respectively), which largely compensates for the higher investment required compared to traditional methods. With a relatively shorter smoking period (2 to 3 hours), this processing technique is more adapted to the individual character of work practice in this profession and is easier to use. Furthermore, the possibilities of using scraps as combustibles (millet straw, reed leaves, wood sawdust, various branches...) reduce operating costs. Another major advantage of this technique is its double use. The Parpaing oven is, indeed, used both for fish braising and smoking. In terms of environment management, Parpaing oven reduces significantly smoke pollution and exposes less fish processors to some lung diseases.

III. Evolution Of Stock Level Indicator Paths Of Main Export Species

The concentration of all fishery support mechanisms since the 1970s and 1980s on small-scale fishing and export has resulted in stronger fishing pressure being exerted by trawl and small-scale flotilla on coastal demersals – the main species traded on West European markets. A study on about twenty traded demersal species has just been completed based on trawling campaign and fishing statistics covering the past twenty years². It reveals a decline in stock level indicators, and notably in catches per effort unit for the majority of species under review.

A. Relative stock level as determined from evaluation campaigns

UNEP, Environmental and Socio-Economic Impact of Trade related Policies on Senegalese Fisheries Sector, 2001.



Evaluation campaigns were carried out between 1986 and 1995. The period covered by the campaigns is very important. In this connection, the following diagram, which shows the evolution of the Dakar-based demersal trawlers' fishing effort, reveals that all the campaigns took place after significant fishing effort had already built on tapped coastal demersal resources.

1986, the year in which the first campaign took place, coincided with the time when freezer trawlers' effort started exceeding that of icebox boats which was noted to have been on the declining since the early 1980s. The observed decrease in icebox boats' effort since the early 1980s reveals, in the light of icebox boats' strategy, that the stock level of their main target species (*capitaines*, sea breams, stone basses and shrimps) seems to have declined. The ever growing competition between freezer and deep lying trawls also explains why icebox boats' effort has declined as they have less autonomy than the freezer trawlers. The increase in global fishing effort has impacted significantly on the various species tapped. However, the fact that it was impossible with available data to evaluate specific stock levels before 1986 constituted a major obstacle. This gap will be filled by analysing catches per effort unit on the basis of fishing statistics.

The fact that all flotilla increased their fishing efforts in 1994 was indicative of the strategic adjustment of fishermen with boat ownership, following devaluation of the CFA franc.

The evolution of the stock level indicator of species captured by deep-sea trawls during trawling campaign reflected for all species, a sharp decline between period start and end. Almost all fish species were affected by the fall. Catches of all species

decreased from about 1,000 kg/hour in 1986 to 500 kg in 1991 for the whole Senegalese continental shelf, corresponding to a 50% decline.

The *serranides* group to which the stone bass belongs (of the *Epinephelus* type) exhibited, at period start, a relatively low average stock level of about 30 kg/hour for all species. At period end, catches per effort unit were lower than 10 kg/hour for all species. The same phenomenon applies both to the *sparides*, particularly to the species of the *Sparus* type (couch's sea bream) the relative stock level of which decreased from over 40 kg/hour at period start to less than 10kg/hour at period end, and to the *guitar ray* (60 kg/hour at period start and 5 kg/hour at period end). The declining stock level is the result of the strong fishing pressure exerted on these market value species. Stone basses and couch's sea breams are exported while *selachians* i.e. (sharks and *guitar rays*) are in demand for their fins, which are exported in dried form to Asia. Another major factor speeding up decline in stock levels is the fact that freezer trawlers reject back into the sea not-up-to-measurement young and juvenile fish caught in the nets and keep only individuals of acceptable size.

Inversely, some species like octopuses (*Octopus vulgaris*) saw their relative stock level increase over the same period. In 1986, the relative stock level of octopuses was lower than 5 kg/hour, reached 10 kg/hour in 1995 and exceeded 15 kg/hour in 1994. Other secondary species found along the continental shelf and slopes such as scorpion fish and hakes follow the same pattern.

B. Relative stock level as determined from fishing statistics

The statistics on captures and fishing effort are available in database form for the period spanning 1971 to 1998.

Stock level indicator paths analysis over the period under review (28 years) confirms observations made during trawling evaluation campaigns by highlighting a sharp fall in catches of all species per effort unit. However, some species are particularly affected. The latter belong both to the *Scianidae* and *Sparidae* community and are particularly targeted for export.

The relative stock level indicator of the *badèche* (*Mycteroperca rubra*) was lower than 10 kg/hour in 1998 whereas it exceeded 50 kg/hour during the 1970s.

Catches of *capitaines* (*Pseudotolithus spp*) of all species per effort unit was lower than 10 kg/hour in 1998 whereas they were over 2 tons at the end of the 1970s.

The stock level of *pink sea breams*, which exceeded 300 kg/hour in 1975, fell to 50 kg/hour in 1998. It is important to note, however, that many species of *sparidae* are designated by this same commercial name. In fact, they include both coastal demersals of the continental shelf such as couch's sea breams (*sparus caeruleostictus*) and those found on the edge of the continental shelf and slope and commonly known as deep dentex (*Dentex macrophtalmus*, *D. canariensis*). The actual decline in the stock level of a given species is masked by increasing the quantities preserved from another one. However, in the past few years, the deep dentex found along the edge of the continental shelf and slope were noted to have become gradually dominant.

The *pageot* (*Pagellus bellotti*), the relative stock level of which was higher than 1000 kg/hour in the early 1980s, recorded a sharp decline over the second half of the same decade. Since 1990, its relative stock level has wavered between 200 and 400 kg/hour with a slight upward turn. This increase might be explained by the fact that species around the continental shelf and slope have been included in this commercial category.

The relative stock level of *machoirons* (*Arius spp*) followed the same pattern as the *pageot*. It fell sharply during the second half of the 1980s from over 4000 kg/hour in 1981 to about 100 kg/hour in the early 1990s. The relative stock level of *machoirons* was noted to have increased significantly since 1996.

The *Thiékem* (*Galeoides decadactylus*) saw its stock decline as from the early 1980s, from over 1000 kg/hour in 1981 to about 130 kg/hour in 1995 followed by a slight increase from that year up to 1998.

Catches of stone bass (*Plectorhynchus mediterraneus*) per effort unit once over 140 kg/hour in 1977 declined to below 20 kg/hour in 1998.

The coastal white shrimp (*Penaeus notialis*) saw its relative stock level reduced to 60 kg/hour from over 800 kg/hour in the early 1970s.

The same applies to the *Thiof* (*Epinephelus aenus*) as its relative stock level was lower than 10 kg/hour in 1998 compared to 140 kg/hour in the early 1970s. This sharp decline in the stock level of *thiof* applies to almost all other species of stone bass.

However, the relative stock level of a few species increased, which might explain some replacement phenomena. These include cuttlefish, *roc soles*, octopuses, and to a lesser extent, *brotules*, *sompatts* and red mullets.

Fishing statistics indicate that available campaign information were gathered at a time when resource levels were already generally low. In fact, the decline in the stock level of various species reported by evaluation campaign data is by far lower than actual fall in stock level recorded over a longer period (about 30 years).

C. Justification of observed paths

The global decline in the stock level indicators of coastal demersals can be explained both by increased fishing effort on and competition between these species and by the development of negative fishing practices in reaction to this reduction.

The illegal incursions of demersal trawlers in some clearly coastal zones causes medium term biodiversity erosion and deterioration of habitats in these areas. This explains why off the *Saloum* Central Delta, the major individuals of red mullets (*Mugil cephalus*) measuring 70 cm are captured only accidentally nowadays. Their preferred aquatic plant habitats have been devastated and raked by boat trawls in search for soles and cuttlefish in areas reserved for small-scale fishing.

The most coastal fraction of stocks tapped offshore by industrial fishing is fished by small-scale fishing units. This fraction plays an essential part in feeding offshore fisheries. In fact, coastal zones constitute breeding grounds for almost all coastal demersal species. From birth to recruitment age, juveniles and young individuals of market value species are confined to coastal zones. Uncontrolled exploitation of these fragile resources by small-scale fishermen through non-selective and destructive fishing causes considerable damage to the renewal of the adult stocks exploited by industrial fisheries and hence to the stocks of reproducers expected to supply coastal breeding grounds with juveniles. The decline in relative stock levels is therefore not

the consequence of industrial fishing activity alone. The Senegalese small-scale fishing is now free of access and exploits intensively the coastal band sometime through irresponsible fishing. It has been observed that some regulatory provisions are not applied to small-scale fishing operators in terms notably of the mesh size of the fishing engines used. Resource scarcity is behind the conflicting competition between the two types of fishing. These conflicts range from sometime dramatic incursions of industrial fishing units in areas reserved for small-scale fishing, to exporting factory owners' requests to supply their companies through catches of small-scale fishing.

In view of the fact that the level of global effort is largely higher than the rate that resources can possibly sustain to maintain exploitation sustainability and trying to break even with the sea trips of their fishing units by increasing fish captures, fishermen are compelled to develop compensatory adjustable reactions: small-scale fishermen go to fish in increasingly distant zones and associations with industrial fishing trawlermen have surfaced. The noble species captured by small-scale fishing boats are then bought and preserved for export within the trawler which then serves as a refuelling and security base for the pirogues. These common interests contribute to depleting coastal fishing zones through increased small-scale fishing effort and to reducing landed quantities of fish on the domestic markets.

On the industrial fishing front, compensatory adjustable reaction is more transparent for shrimpers. In this connection, due to their small mesh size (40 mm instead of 70 mm for fish boats) and in view of the scarcity of the type of shrimp sought, most shrimpers exploit only fish with finally very small landing of shrimps on their return from sea trips. The use of shrimp trawl for catching fish entails rejection of great quantities back into the sea on sorting captures thus contributing to increased resource destruction and to reduced levels of stocks of fished species. As a result, in 1998, the Fishing Department, in collaboration with the Research Department, monitored the specific composition of nominal landings by shrimpers. Many boats which had been issued shrimp fishing license have been "downgraded" to fishing boats because of the limited quantities of shrimps landed over a period of several sea trips.

The ultimate measure taken by the authorities in charge of fisheries was to freeze industrial fishing effort. While the measure is political, it is of little interest

biologically speaking. What was actually called for was not a freeze but rather a reduction of fishing effort. And even then, the measure applied only to industrial fishing, under estimating the considerable fishing pressure exerted by small-scale fishing on the sea resources of the coastal zone. The following table on the comparative evolution of small-scale and industrial fleets from 1980 to 1998, is clearly indicative of the evolution of the effort levels applied by industrial fishing and small-scale fishing on sea resources.

YEAR	INDUSTRIAL FISHING			SMALL-SCALE FISHING	
	<i>National Fleet</i>	<i>Foreign Fleet</i>	<i>Total</i>	<i>Number of pirogues</i>	<i>Number of fishermen</i>
1980	121	163	284	8 488	30 707
1985	154	85	239	5 100	41 770
1990	132	135	267	10 411	48 122
1994	137	102	239	9 632	52 498
1998	176	75	251	10 707	51 197

Source MP/DOPM

IV. Specific Environmental and socio-economic impacts of different Fisheries Subsidies in Senegal

A. Support to modernisation

1) Tax reductions on motors and fishing gears

1) The policy of tax reductions on motors and fishing gears was implemented as authorities realised the capital role played by small-scale fishing in the development of the sector. Motorization is, no doubt, the most decisive element in the modernisation of the small-scale fishing sub-sector. The bigger size of pirogues, extension of sea trips, tapping of new fishing zones and the introduction of purse seine are direct evidence of this policy. It is uncertain, however, that motorization was the direct result of the government's tax reduction policies. They certainly contributed to it, but the amount of CFAF 2 billion annual tax reductions weigh little by comparison to the CFAF 200 billion turn over of the sector, to the extent that their suppression would not prevent the majority of the operators involved to self-finance their activities. At worse, only less profitable companies could be possibly forced out of the sector. Whereas, these are mainly pelagic fishing units, which in view of the existing operating possibilities for these species, do not raise the same environmental problems as demersals. Besides, because they are domestic market-oriented, these

small fishing boats discharge an important function in the country's food security policy. The whole question remains unanswered as to why should these measures be maintained for export-oriented fishing units, the majority of which are prosperous and the products of which do not benefit the Senegalese consumer.

2) Subsidised fuel

Even when government interventions are restricted to subsidising production, they reinforce fishing capacity through their technological impact. Subsidised fuel is the type of subsidy that has the most immediate impact on technological development and it also encourages boat owners to acquire more powerful hence more fuel consuming motors. These engines also allow fishermen to go farther and to stay longer out at sea and to increase their fish catches accordingly. There is no doubt that subsidised fuel produced a significant impact on the extension of the sea trips of line and icebox pirogues and subsequently contributed to the intensified efforts of demersal fishing. Maintaining it in the current circumstances in which export-oriented fishing units have improved their profitability is questionable. Ways to institute some discrimination between pelagic and demersal fishing should clearly be sought.

3) Activity funding policy

As far as activity funding policy is concerned, despite the attractive conditions offered (20% self-financing requirement instead of the usual 33% required by project promoters, subsidised lending, preferential interest rates...), the total outstanding amount of CNCAS' portfolio is too limited for these funding to have produced any significant social or environmental impact. In any case, the situation of small-scale fishing companies being so different both economically and in terms of their contribution to the national goal that it seems difficult to pass a final judgement on such subsidies. On the one hand, they benefit fishing units which would be profitable at any rate even though they contribute little to food security (demersal fishing units); on the other, they are at the same time insufficient to guarantee perpetuation of pelagic fishing companies. On industrial fishing, the economic promotion fund is also insufficient to finance large-scale projects, which explains the underdevelopment of tuna fishing. Trawler fishing, which is already sufficiently developed in relation to the

current level of exploitation of stocks of crustaceans, demersals and cephalopods, appears to benefit most from this situation.

4) Building of fishing wharves

The building of fishing wharves should have positive environmental and sanitary impact. First, mainly because of the lack of landing infrastructures, small-scale fishing faces heavy losses (about 20% of production) to the extent that fishing wharves might contribute to increasing volumes. Secondly, landings are done under very unsatisfactory sanitary conditions, which pleads for the construction of wharves to protect public health.

5) Central Fish Market

The Central Fish Market played a positive role in improving marketed product quality despite the relative low level of quantities involved and it facilitated regulation of fish supply in the Dakar region. Beyond its specific importance, the role of the central fish market should be viewed from a national perspective in which fishing product is hardly valorised locally. Marketing constraints and such great inequalities still subsist between Dakar and the rest of Senegal, between the coastal and landlocked areas, between urban centres and the rural world.

As a rule, support to modernisation is not important enough to produce any significant social, environmental or economic impact. Tax reductions on motors and fishing gears probably produce more impact than the funding policies but they have been weakened by the fact that no differentiation is made between the different categories of companies operating in the sector. On the other hand, existing infrastructures are clearly insufficient for small-scale fishing to benefit fully on the domestic market from the strong demand generated by a growing population. It is therefore necessary to create the conditions conducive to a proper market operation. The policy that would need to be followed is to reinforce the material infrastructures of markets located in

the countryside and especially to improve on communications and storage facilities. Fish and seafood wholesalers and sellers have to face an acute shortage of adequate transport and storage facilities. There are huge losses, which means that the bulk of the production must be sold immediately, thereby, weakening the negotiation power of fish and seafood wholesalers and finally discouraging investments in this activity. Planning and building of storage facilities by the public sector for the private sector would lessen extreme price fluctuations.

B. Support to domestic and international marketing

1) Creation of fish trading centres and ice chain projects

The creation of fish trading centres and ice chain projects have not been successful, mainly because they have been unable to deal with most of the landings and also because they have been based on a conflicting vision of relationship between fishermen and small-scale fish and seafood wholesalers. In fact, fish and seafood wholesalers realised early enough the need to invest upstream in the purchase of boats and fishing gears so as to ensure abundant and regular supply. Compared to an industry where operators' spontaneous dynamics have always prevailed over official interventions, the government should content itself with providing adequate infrastructures for improved marketing and leaving the latter to the private sector to develop it. This notwithstanding, the local valorisation of sea products has not benefited much from marketing support a significant part of which went to export promotion.

2) Status as a Free Zone and Duty-free Export Company

The Status as a Free Zone and Duty-free Export Company thus grants significant advantages to export-oriented processing units. Established in 1974, *the Zone Franche Industrielle (ZFI)* or Industrial Free Zone of Dakar offers companies located there a range of attractive tax, social and customs incentives. The law of April 1991 establishing the creation of a Free Zone grants the same advantages to export industries based outside ZFI. In 1995, this law was extended to cover agricultural companies (including fishing industries) exporting 80% of their production.

These incentives attracted sea product packaging/processing companies trying to take advantage of growing international demand for sea products, especially in developed countries. The presence of so many companies exerts strong pressure on demand for exportable products and ultimately represents a threat to stocks of demersals, crustaceans and cephalopods.

3) Export subsidy

Initially, export subsidy was not meant for the fishing sector. It was instituted in 1980 to boost exports of agricultural products, which were severely affected by a deterioration in the international terms of trade. Previously set at 10% of FOB value, it was raised to 15% in 1983 and extended to tuna. Following its second revision in August 1986, it culminated at 25% and benefited all sea products. It was cancelled only in 1994 in the wake of the devaluation of the CFA franc by 50%.

In an adverse economic context, this subsidy certainly produced more negative effects on the environment than in other countries where this type of measure was adopted. Actually, its institution coincided with the implementation of structural adjustment programmes that resulted in the devaluation of the CFA franc. These programmes were generally aimed at increasing the level of exports, including that of sea products, translating into ever increasing pressure on the main stocks of export species.

4) Devaluation

Devaluation was the cornerstone of the macro-economic reforms recommended by donors. It aimed at neutralising the distortions affecting CFA franc exchange rate. In practical terms, the overvaluation of an exchange rate represents an export tax and an import subsidy. The various agreements concluded by Senegal and Bretton Woods institutions defined an intricate set of measures aimed at restoring equilibrium in public finance and included the reduction of government spending and support to export receipts generating sectors. The increase in foreign exchange earnings brought about by the good performance of external trade helped to relief debt service burden.

Devaluation certainly produced an environmental impact. The higher performance of export companies translated into intensified fishing effort, which negatively affected stock balance though the higher cost of imported inputs sometimes limited such possibilities. In fact, it depended on whether it was export or domestic market-oriented companies. While stronger external demand more than proportionally compensated, for the former, input costs, the operating accounts of the latter sharply deteriorated following devaluation, raising fears that domestic demand might be confronted with supply problems. Besides the capture component, devaluation also seriously affected the processing sector. The prospects of making higher profits attracted many new comers whereas the stocks of exportable products are not elastic. This situation led to a surge in the prices of raw materials and to supply difficulties for the plants. Everything being equal elsewhere, the extra demand of export units probably resulted in intensified fishing effort while the yield of demersal catches was already clearly declining.

5) Lome Agreement

Given that European demand is rather for high market value noble species, the commercial advantages granted under the Lome Agreement (which constitute some form of subsidy) probably contributed to increased fishing pressure on the endangered stocks of demersals, crustaceans and cephalopods.

6) Fishing agreements

As it appears, fishing agreements also favoured growth of export volumes. Despite the financial compensations, experts believe that it is one of the main causes of overexploitation of maritime resources in African countries. By lowering fishing units' production costs, the agreements encouraged them to fish beyond the economic optimum compatible with sustainable resource management. Moreover, as they involve mono-specific industrial fishing which is subject to quotas, boats do not hesitate to throw back into the sea catches that do not correspond to the species or size required so as to maximise the value of their production. On the other hand, fishing in Senegal's ZEE by foreign fleets is not properly controlled by Senegalese authorities because they do not have adequate means and facilities to do so.

As for the problems created by the agreements and the level at which solutions should be sought, there is need to make a distinction between high sea pelagic resources and coastal demersals. With regard to Tuna fishing under the agreement, the possible risks of stock depletion that it may give rise to, should be dealt with at the international level. Atlantic Tuna stocks are shared by the countries bordering this Ocean and Senegal's capture capacity are almost non-existent. Inversely, the national fleet both industrial and small-scale largely have access to demersal resources which are already over tapped, raising questions about the relevance of pursuing the quota policy on these resources. At best, the amount of financial compensation is not important enough to justify the pursuit of this policy by development objectives. At CFA franc 32 billion every four years, the European Union is paying the highest amount under the latest agreements. This represents CFA franc 8 billion annually, an amount to be compared to the total value of exports or CFA franc 180 billion.

7) Upgrading of to international standards

The measures designed to support upgrading of some export units to international standards will not necessarily have a negative impact on the environment even though they focus on stocks of demersals, crustaceans and cephalopods. What is at stake is the amount of advantages which indiscriminately benefited all exporting companies. These companies which already benefit from the statutes of a free zone and duty-free export company and as well as from an export subsidy, also take advantage of the favourable provisions of the Lome Agreement, of the fishing agreements providing for landing requirements and devaluation. This environment encouraged, especially after devaluation, too many new comers to enter the sector even though they often neither have sufficient financial standing nor offer consistent technological contribution. As a result, export structures shifted to fresh and frozen products and left only little room for elaborate processing (canned food, medallions, fish steak, peeled shrimps...). This situation is neither satisfactory environmentally as exporters of non-processed products give preference to volumes rather margins, nor economically since the level of their value-added is globally low. Consequently, measures that would be designed to favour companies with the highest value-added on their production at the expense of speculative motivations, which contributed to pulling down the processing

component, are not necessary negative. In a context of scarce resources and higher prices of raw materials, one certainly 'd better favour selective measures in order to reduce the number of companies operating in the sector and encourage elaborate production. Such measures should be beneficial both environmentally and economically.

Globally, export support measures have produced negative environmental and socio-economic impacts. They instigated massive shifts to fishing for coastal demersal species which resulted in stock depletion. For the marketed species of this category, the latest trajectory of abundance indicators (UNEP, 2001) clearly point to a dramatic fall in the number medium sizes and to a risk of biological break. Concurrently, these shifts reduced quantities available on the domestic market, leading to sharp price increases. In view of the importance of fish for the country's food security, the social consequences of these measures are very negative. Lastly, of course they contributed to increasing not only volumes but also the value of exports. However, they have remained evidently too general to guarantee their durable growth. In particular, the arrival of too many new comers in the processing/packaging component, especially in a context of scarce resources and high prices of raw materials, weakened the situation of many companies. In future, while some measures may be justified in an effort to safeguard foreign exchange objective, general and indiscriminate measures, on the contrary, should be banned.

C. Support to small-scale processing units

In view of its strategic importance for fish supply regulation on the domestic market (small-scale units process one-thirds of fish landings; it uses the products neglected by fish and seafood wholesalers, extends conservation period and facilitates access to cheap animal proteins...), support to small-scale processing units has so far been limited. Technology dissemination programmes designed to improve the yields and sanitary conditions of this activity go in the right direction, but in a context of supply difficulties on the domestic market, more systematic support measures designed to improve product handling, packaging and storage would offer many advantages. They would help to limit post-capture losses, to facilitate the populations' access to animal

proteins and to reduce human health exposure, thus offering clear social and environmental advantages.

Conclusion

Following Independence, country authorities accordingly laid emphasis on direct and strict support first to production (the capture component) in the industrial sub-sector and later in the small-scale fisheries sub sector. The primary objective of these direct support measures was to supply the domestic market with animal proteins. Progressively between the 1970s and 1980s, the mechanism was given a twist towards support measures in favour of international rather than national marketing. In the meantime, slowing traditional exports (phosphates and ground-nut) had brought fishing to the frontline in terms of foreign exchange policy. Since then, promoting exports of sea products has become a permanent objective of support policies. And yet, this strategy gradually contradicted the food security objective. It succeeded better than direct intervention policies in influencing small-scale fishermen, but the latter finally fished more for exports than for the domestic market. In fact, 60% of the industries' needs are covered by small-scale fishing units. Some industrial units thus pre-finance the outfit of a small-scale unit against a promise to sell their production at a pre-set price. Small-scale fishing units intensified their fishing effort for coastal demersal resources thus adding to the pressure already exerted on these resources by the Senegalese and foreign trawler fleets. The majority of the species marketed from this stock are already on the biological break list. At the same time, the rapidly growing number of companies operating in the packaging/processing component is a threat to the durability of most of them. Additional demand coupled with scarce resources entailed a surge in the prices of raw materials, which eventually, jeopardises foreign exchange objective. The situation, therefore, appears to be ripe enough to pursue simultaneously environmental, social and economic objectives. This should be in future the objective of support to the fishing sector.

While development policy fully played its role in propagating technological progress as evidenced by the successful outcome of motorization and introduction of purse seine, some elements tend to indicate that it has reached its limits at least in its current

form. Some types of exploitation recorded sharp declines in their yields over the past few years. Up to 1982, purse seine fishing was very profitable; it now faces some difficulties that seem to be linked to an over fishing phenomenon observed on the *Petite Côte*. Like surrounding gill nets fishing, it was especially affected by the higher costs of inputs since devaluation occurred whereas its production (meant for the domestic market) price hardly increased.

Should the general support policy in the form of tax reduction on inputs or subsidised fuel be perpetuated, it is likely to present an overall negative balance sheet. First, because it encouraged an extension of fishing effort which is perhaps higher than the economic optimum and secondly, it is a burden on government budget in a situation of economic crisis. The Government of Senegal's annual indirect financial contribution to small-scale fishing is estimated at CFA franc 8 billion. Some illicit practices (parallel market of subsidised fuel) call for increased control over distribution of inputs benefiting from tax reductions. A discrimination certainly has to be gradually established between export-oriented fishing units and those that dispose of their production on the domestic market.

Building landing infrastructures and marketing was relatively cheaper (slightly over CFA franc ten billion for fishing wharves and the central fish market over about ten years) if the relatively long amortisation period were to be taken into consideration. It has some advantages both environmentally and socially as it contributes to reducing post-capture losses and improves distribution conditions to the benefit of the populations respectively.

Similarly, support to domestic marketing, which is practically non-existent at this time, would facilitate the populations' access to fish. On the contrary, indiscriminate support to exports such as export subsidy, the free zone or export company status, the Lomé Agreement and devaluation created as many environmental, social and potentially economic problems as it resolved to restore balance in the country's external accounts. By making important concessions to exporters, this policy encouraged secure income and speculative behaviours, which certainly played a role in the relatively low level of elaborate processing (15%) and allowed to many operators to enter the sector. While it is difficult to quantify indirect transfers to the

sector under the Lome Agreement or following devaluation, they, however, largely contributed to the doubling of exports value between the 1980s and the 1990s (from CFA francs 90 to 180 billion). As for the duty-free company status and export subsidy when they were instituted, both resulted in direct or indirect transfer of about CFA francs three billion to the sector. With regard to exports, support should therefore be limited, in future, to the best performing companies that sell products with the highest industrial value added. The amount of CFA francs 27 billion subsidy to finance upgrading to international standards seems to meet these conditions.

As far as small-scale processing units are concerned, it is regrettable that despite the social functions that they discharge (high level of intensive labour, retrieval of unsold products, its relatively cheap access price...), it benefits only from very limited support. Lastly, the policy of support to small-scale fisheries wholly depends, for investment financing, on recourse to foreign assistance with the subsequent financial dependency. Tied aid practice and donors' preferences imply often questionable technological choices.

In short, the amount of direct or indirect transfers is not so much important that it raises a problem per se. With about fifteen billion annually (slightly over twenty billion if the amount of compensations paid under fishing agreements are taken into account although they have not always been retroceded to the sector) compared to a turn over of more than 200 billion, Senegalese fisheries are far from being massively subsidised. Nonetheless, some forms of aids remain questionable. These are, notably, the general measures designed to support small-scale fishing units and exports whereas external market-oriented companies already benefit from serious advantage to the extent that they threaten domestic market supply. Henceforth, the policy would certainly be to favour domestic market-oriented fishing units if the food security objective were to be maintained and to limit export subsidies to elaborate products so as to contain pressures on resources. On the contrary, support to local valorisation, which is under underdeveloped at present, might be strengthened.

Table 1: Evolution of annual fuel consumption by small-scale fishing units, trade value and subsidy amount

YEAR	CONSUMPTION (LITRES)	TRADE VALUE (CFAF 1 000)	SUBSIDY (CFAF 1 000)
1986	19 246 506	3 310 399	1 688 303
1987	19 506 000	3 355 032	1 711 066
1988	19 713 644	3 390 747	1 729 280
1989	18 381 483	3 161 615	1 612 423
1990	21 191 814	3 644 992	1 858 945
1991	25 374 624	4 364 435	2 225 861
1992	24 504 620	4 219 795	2 152 095
1993	24 934 957	6 483 089	3 306 375
1994	27 662 776	7 192 321	3 452 314
1995	27 963 161	6 572 367	3 154 736
1996	31 871 468	8 278 060	3 973 468
1997	35 605 679	9 128 476	4 381 668
1998	50 441 417	13 114 768	6 295 088

Source : DOPM