

# Fisheries and the Environment

## **Fisheries Subsidies and Marine Resources Management: Lessons learned from Studies in Argentina and Senegal**

United Nations Environment Programme

### **Note**

The views and interpretation reflected in this document are those of the author and do not necessarily reflect the views or positions of the United Nations Environment Programme.

## Acknowledgments

The Argentine and Senegalese studies presented in this report were conducted within the framework of two broader UNEP Country Projects that involved the collaboration of a number of individuals and organizations. Each of these projects aimed to assess the environmental and related social and economic effects of trade liberalization and trade-related policies, as well as to develop policy response packages that contribute to mitigating the negative impacts and enhancing the positive impacts identified through the assessments.

At the country level, two experts from national institutions, Maria Onestini from the Centro de Estudios Ambientales, Argentina, and Karim Dahou from ENDA Third World, Senegal, assisted by collaborators from an array of research institutions, non-governmental organizations and national agencies, and in consultation with national stakeholders, worked tirelessly to complete the studies. They took stock of the findings from past and recent work on fisheries subsidies at the national and international level, gathered field data specific to the evolution of the policy setting affecting major fisheries in Argentina and Senegal, and identified the environmental and related socio-economic effects of the main subsidies analysed in each country.

The Argentine and Senegalese studies were presented and reviewed at two international meetings convened by UNEP. They were first presented at the UNEP Fisheries Workshop that took place in February 2001 in Geneva, where they were discussed by governments, international organizations, non-governmental organizations, experts, and policy-makers. They were subsequently revised on the basis of the feedback received during the workshop. Ronald Steenblich (Organization for Economic Co-operation and Development-OECD) also provided extensive comments.

At UNEP, the project was initiated and led by Hussein Abaza. The studies were coordinated and co-edited by Emeline Fellus, and reviewed by Eugenia Nuñez, Konrad von Moltke (Institute of Environmental Studies, Vrije University) and Theodore Panayotou (Harvard University, United States). Désirée Leon provided administrative support.



## **United Nations Environment Programme**

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ronment and enhancing their capacities in developing mutually supportive trade and environment policies, and providing technical input to the trade and environment debate through a transparent and a broad-based consultative process.

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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 also a source of employment for about 200 millions people directly depending on ocean fishing for their livelihoods. About 40 per cent of the world fishery production enters international trade with nearly half of fishery exports deriving from developing countries, and in some of the latter represent up to 80 per cent of the total exports (Dommen and Deere, 1999)<sup>1</sup>.

In recent years, after four decades of steadily expanding catches there have been important declines in fish stocks, especially of preferred species for human consumption such as cod, haddock and plaice. While 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)<sup>2</sup>.

Major ecological, economic and social damage is already evident. In particular, declining catches have cost 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)<sup>3</sup>.

Overfishing of the world's marine resources is the main cause for the decline of fisheries productivity. According to the Food and Agriculture Organization (FAO), 50 per cent of all fishery resources are fully utilized at present, 25 per cent still hold potential to be further exploited, and the remaining 25 per cent are in severe danger of depletion and require major interventions to restore sustainable yields.

Widespread overfishing is widely recognized as a growing threat to the sustainable management of the world's fisheries. In major fishing states, investment in new capacity (vessels, equipment and labour force)

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<sup>1</sup> Dommen, Caroline and Deere Carolyn (1999), *Fish for Thought: Fisheries, International Trade and Sustainable Development*, Natural Resources, International Trade, and Sustainable Development Series No. 1, ICTSD and IUCN: Geneva.

<sup>2</sup> 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.

<sup>3</sup> Weber Peter, *Net Loss: Fish, Jobs and the Marine Environment*, *Worldwatch*; 1994.

has supported fishing efforts at levels significantly exceeding the reproductive capacity of fishery grounds. Excessive government support policies and especially subsidies to the fishing industry are suspected by many experts to have a direct causal relationship to recent trends in overfishing.

However, opinions still differ as to the relative importance of fisheries subsidies as a factor affecting the stability of fisheries resources. More work is required to address the linkages between fisheries subsidies and fisheries resource sustainability to guide progress towards a potential reform of fisheries policies worldwide. Policy reforms should integrate environmental, social, economic, and trade objectives to ensure long-term sustainability of entire fishery ecosystems while minimising 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 categorise current forms of government support and to assess their environmental, social, economic effects.

To help meet the need for additional study, UNEP supported these two studies on fisheries subsidies in Argentina and Senegal in 2001. Examining the main types of support and subsidies provided to the fishery sector over the last decades in Argentina and Senegal, these studies provide a detailed assessment of their environmental, and related socio-economic impacts. They offer valuable insights to trade and environment officials who want to increase their understanding of the intricate relationship between subsidies and the environment in the fishery sector, and to national policy-makers seeking to promote productive and sustainable fishing industries in their countries.

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# 1

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## **Subsidies in Argentine Fisheries**

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### **1. Introduction**

Argentine fisheries face a crisis situation currently. In this country, fisheries exploitation has been subsidised from both international and to some extent national sources, making this an intricate part of the problem. Fisheries exploitation in Argentina has grown at unprecedented rates in recent years, and this has been one of the country's most dynamic economic sectors in the past 15 years. Value added has grown steadily and exports grew 478 per cent between 1985 and 1995 (while in comparison total exports increased 159 per cent in the same period). A signifi-

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cant shift from overall under-utilisation to over-exploitation of some fishing resources took place in the 1990s. A clear connection with international markets is present as a result of: the transnationalisation of capital in the fisheries industry; the issue of permits to foreign boats to operate in Argentine jurisdiction; and by the fact that up to 90 per cent of production is exported in some periods. A notable alteration also occurred internally given the high degree of growth of fisheries exploitation from Patagonian ports.

In the early part of the decade, charter agreements with fleets from Asian countries were signed, mainly for the capture of squid. Another major change experienced in relation to Argentine fisheries was the agreement with the European Union, negotiated and ratified in the early 1990s and in place until the late 1990s. This accord, the first of the so-called "second generation" agreements on the subject signed by the European trade bloc, involved the participation of joint ventures and temporary associations of companies of Argentine and European capital in the fisheries industries. These changes, as well as global transformations in the fisheries sector, have radically modified the way that fishing activities are conducted in the country.

The above processes took place in a context of deep economic change. Although the opening-up of the economy began in the 1980s, the major transformations of the regulatory context took place in the 1990s with a new set of policies that combined stabilisation programs with structural reforms and liberalisation of trade. Its main components were (a) stabilisation program: fixed foreign exchange rate, tight monetary policy; (b) commercial openness (trade liberalisation); (c) state reform: privatisation of public utilities; and (d) deregulation of markets and economic activities.

The opening up of trade occurred within this structural reform context, paving the way for a series of effects. Among the effects some are more salient, such as: an initial increase of foreign direct investment; increases in domestic consumption, production, productivity, investments and exports; access to new technologies on process and products, logistics and communication; organizational innovations; as well as modernisation of infrastructure and services. At the same time, however, these profound transformations have resulted in an economic system that remains increasingly dependent on the supply of foreign capital, inputs, and capital goods. In addition, some negative trends can be pointed out, such as (a) higher rates of concentration and transnationalisation of the economy, with the crowding out of many small and medium size firms;

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(b) “de- clustering” processes in many industrial chains, as a consequence of the substitution of national productions by imports; (c) high rates of unemployment and under employment and deterioration of labour conditions; (d) worsening income distribution; (e) higher pressures on natural resources, without appropriate institutional, legal and organizational rules and control systems; (f) increasing fiscal deficit and foreign indebtedness.

Fisheries exploitation was one of the sectors of the economy that experienced the highest growth during the first years of economic structural adjustment policies. This sector grew at unprecedented and rapid rates, benefiting from a series of national and international economic policies and due to a set of environmental circumstances, among them diminishing resources in developed countries’ seas.

The result regarding fisheries however has been mixed. Although the sector has had positive growth rates in the early years of fisheries exploitation expansion, the latter years have been characterised by economic losses, overcapacity, unemployment, social unrest, increased fishing effort and decreasing fishing stocks (for some species amounting to virtual collapse).

The current paper will try to provide a first approximation to an assessment on the relation between subsidies and fisheries exploitation in Argentina in the 1990s, paying particular attention to the international dimension. This work will attempt to survey direct and indirect subsidies in the fisheries sector in Argentina, and to assess inter-linked ecological, social and economic impacts of these subsidies.

## **2. Subsidies and natural resource exploitation: The case of fisheries**

Subsidies and other incentives are increasingly being analysed in relation to their potential adverse effects on ecological variables and economic distortions. The case of fisheries, although far from conclusive as of yet, is one where there is a general consensus as to the large extent in which this sort of economic activity is subsidised, as well as an increasing recognition of the negative impacts that these subsidies can have on sustainable development.

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First of all, in order to frame conceptually the following examination, a definition of subsidies must be noted. This is not an easy task given that defining what is and what is not a subsidy is one of the points of contention among and between policy-makers and/or analysts. The issue is further compounded when subsidies are characterised or perceived according to outcomes or aims. In the ensuing literature some definitions are quite simple, such as indicating that subsidising is the “practice of providing governmental support to the fishery sector.”<sup>4</sup> Other definitions are more thorough, taking into account the differences between production and consumption subsidies. For example, “*subsidies comprise all measures that keep prices for consumers below the market level or keep prices for producers above the market level or that reduce costs for consumers and producers by giving direct or indirect support*”<sup>5</sup>

There have also been attempts to operationalise concepts in order to unravel the intricate pattern of subsidies impacting on natural resource use.<sup>6</sup> The OECD has tried to do this through a typology that classifies subsidies according to some of their characteristics, as indicated below with some examples:

1. Budgetary subsidies
  - a) direct (such as: grants or payments to consumers or producers);
  - b) fiscal policies (such as: fiscal credits, exemptions, allowances, exclusions and deductions, rate relief, tax deferrals, and preferential tax treatments);
2. Public provision of goods and services below cost (for example, provision of infrastructure and complementary/utility services or research financing);

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<sup>4</sup> See, for example, “Towards Rational Disciplines on Subsidies to the Fishery Sector: A Call for New International Rules and Mechanisms”, David Schorr, World Wildlife Fund, September 1998.

<sup>5</sup> See de Moor A.P.G. (1997), “Perverse Incentives Subsidies and Sustainable Development: Key Issues and Reform Strategies”, Institute for Research on Public Expenditure. The Hague, The Netherlands.

<sup>6</sup> See Steenblik, R. P. and Gordon Munro (1999). «International work on fishing subsidies—an update», in M. Riepen (ed.), Proceedings of the PECC Workshop on The Impact of Government Financial Transfers on Fisheries Management, Resource Sustainability and International Trade, Manila, 17-19 August 1998, PECC Secretariat, Singapore.

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3. Capital cost subsidies (such as, preferential loans, loan or liability guarantees, debt forgiveness);
4. Policies that create transfers through market mechanism
  - a) domestic—oriented policies (such as price regulations, quantity controls, government procurement policies)
  - b) trade—oriented policies (for example, import and export tariffs and non-tariff barriers).<sup>7</sup>

Other subsidies (general and specific) commonly transferred from governments to the fisheries sectors have also been identified. These are, for example:

- fuel credits
- payments for access to foreign fisheries
- subsidisation of vessel construction
- price support for fish products and products derived from fisheries
- preferential loans and/or grants for transport of fish products
- preferential loans and/or grants for processing of fish products
- unemployment benefits and other social benefits for people employed in fisheries
- worker retraining programs
- export promotion programs
- sponsored vessel insurance
- construction or running of harbours and related facilities
- vessel buy-back.

As stated earlier, there is no set agreement conceptually on what a subsidy to fisheries is, and other organisms are drafting different definitions in search of commonly agreed ground. For example, FAO has recently launched debate around four sets of subsidies defined as follows:

1. Set 1: Government financial transfers that reduce costs and/or increase revenues of producers in the short-term.
2. Set 2: Any government interventions, regardless of whether they involve financial transfers, that reduce costs and / or increase revenues of producers in the short term.

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<sup>7</sup> OECD (2000) as quoted in *op cit*.

3. Set 3: Set 2 subsidies plus the short-term benefits to producers that result from the absence or lack of interventions by government to correct distortions (imperfections) in production and markets that can potentially affect fisheries resources and trade.
4. Set 4: Government interventions, or the absence of correcting interventions, that affect the costs and/or revenues of producing and marketing fish and fish products in the short-, medium-, or long-term.<sup>8</sup>

The WTO's Agreement on Subsidies and Countervailing Measures ("SCM Agreement") comprises more concise and circumscribed definitions. The definition of a subsidy found in the SCM Agreement is now the only legal definition of a subsidy in international trade law. This agreement defines a subsidy in specific terms as a "financial contribution provided by, or at the direction of, a government" that confers a "benefit" (WTO, 1995)<sup>9</sup>. It further specifies that, in order to be considered a subsidy, such a contribution has to involve one of the following: direct transfer of funds or potential direct transfer of funds or liabilities; forgone or uncollected revenues that would otherwise be owed the government; provision of a good or service to a firm or industry other than general infrastructure; or any type of income or price support.<sup>10</sup>

### 3. Impact of fisheries subsidies

It is agreed by most sources that fisheries are a highly subsidised economic endeavour. One of the most cited estimates regarding fisheries subsidies (including by-passed state revenues and direct expenditures) calculated on the basis of revenue versus operation costs is of 54 billion

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<sup>8</sup> See FAO "Report of the Expert Consultation on Economic Incentives and Responsible Fisheries," Fisheries Report No. 638, December 2000.

<sup>9</sup> World Trade Organization (WTO). 1995. *The Results of the Uruguay Round of Multilateral Trade Negotiations*. Geneva: WTO.

<sup>10</sup> The Government of Argentina (GOA) follows for its policy the definition of subsidies set by the SCM Agreement. The Argentine Government sustains that this agreement is applicable to fisheries given that this industry is not covered by the agricultural agreement. Also in this order, the GOA maintains that a subsidy has to be specific to an enterprise or industry branch to be considered as such, as stated in Article 2 of the SCM Agreement. (Communication of the Ministry of Foreign Affairs, International Trade and Religion to CEDEA, February 5, 2001).

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US dollars annually world wide (FAO, 1993)<sup>11</sup>. This is not a direct calculation of subsidies incurred and, therefore, has been scrutinised as an estimate that could grossly overestimate or underestimate reality with regard to fisheries subsidies. Nevertheless, this first approximation by FAO has to a certain degree impelled more finite studies on the magnitude of fishing subsidies world-wide and what impact they have on the use of marine resources. Other more conservative analysis also exists. One indicates that subsidies range between 11-21 billion, representing some 25 per cent of commercial fisheries' total annual income (Milazzo, 1997).

Yet, although the unravelling as to the genuine quantity of fisheries subsidies is a first step, integrated assessment of these subsidies is a crucial point to examine in order to be able to determine actual consequences. That is, an integrated assessment must be indicative of the impact that subsidies cause on socio-economic variables and on natural resources. Clear indicators attest that subsidisation is one of the reasons for overcapacity in fisheries exploitation, affirming that the overcapitalisation of the fishing industry at the international level has been one of the driving forces for the currently unsustainable levels of capacity. Together with other issues, such as the lack of real regulation of fisheries, unclear property rights, and the very nature of the resource itself, subsidies is a paramount problem to contend with when dealing with global fisheries crisis. Furthermore, falling profitability of the fishing industry and social problems (such as unemployment resulting from mis-managed fisheries) add pressure for more subsidies (explicit or implicit ones), creating a vicious circle and a more difficult issue to solve. (Milazzo, 1997).

It has been indicated that the main impact of fisheries subsidies can be divided into three outcomes (Porter. 1998):

1. Drawing more enterprises and capital to the industry than would have occurred in a non-distorted and non-subsidised situation.
2. Impelling enterprises to increase and up-grade fishing technology that increases catch.
3. Discouraging exit from industry when resource exploitation at previous levels is not sustainable any longer.

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<sup>11</sup> FAO Fisheries Department, Marine Fisheries and the Law of the Sea, 1993.

However, interpreting the levels of subsidies, their impact and how they inter-relate with other variables in fisheries exploitation is by no means an easy task. First of all, fisheries subsidies respond to public policy decisions, mainly through pressure from private interests, and thus are an intricate part of a particular country's or region's economic system. The lack of definition as to what constitutes subsidies and the lack of transparency make this type of transfer difficult if not impossible to unravel. In particular in the case analysed (subsidies in the Argentine fisheries) the examination is further hindered by a lack of thorough studies on the subject to date.

The specific issue of subsidies in Argentine fisheries can be basically approached from two perspectives: foreign subsidies and national ones. Subsequently some aspects of these two types of subsidies will be explored.

## **4. Foreign Subsidies**

As it has happened throughout many regions of the world, overexploitation and fisheries collapse in developed countries as well as increasing consumption in international markets led to a shift in fishing activity from developed countries to the Argentine Economic Exclusive Zone, which has been possible due to the opening of the national economy. As stated elsewhere, these changes were mainly instrumented by bilateral agreements between Argentina and third countries or with the European Union bloc.

### **A. Subsidies from Europe**

European subsidies for access to Argentine waters are of different kinds. The main one analysed to date has been the type classified as budgeted subsidies for foreign access.<sup>12</sup> Other types of subsidies, such as

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<sup>12</sup> This is a classification acknowledged by Milazzo, Mateo J. "Reexamining subsidies in world fisheries" (1997). Nevertheless, Milazzo states that these are mainly government-to-government payments for access to distant waters. In the Argentine case the situation differed given that the only payment granted from the EU to Argentina was in the area of "scientific—technical co-operation", due to the fact that this accord is what is called a "second generation fishing agreement" involving joint ventures. All other compensations were given directly to European companies that fished in Argentine waters with a local partner.

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cross-sectoral and non-budgeted subsidies, will also be acknowledged in this analysis (CEDEA, 2000)<sup>13</sup>.

From the European side, the EU–Argentina accord was preceded in the early 1990s by internal regulations of that trade bloc to transfer fishing capacity to distant fleets. The norms that preceded the formal EU–Argentina agreement<sup>14</sup> specifically stated that the creation of joint ventures between European firms and partners from third countries responded to an explicit aim to “equilibrate exploitation of EU waters” and broaden supply sources. The maximum subsidies prescribed in these norms ranged from 75 000 ECU to 487 500 ECU, varying according to the age of the vessel (the newer vessels receiving larger subsidies) and dimensions. Based solely on this type of allowance, it has been estimated that total subsidies (for the 23 ships that operated in Argentine waters under Rule 3944/90 before the EU accord came into place) were 82 million ECU or 100 million US dollars.

The Argentina-EU Accord also included specific items dealing with subsidies that European companies would receive when entering into joint ventures or other types of allowed associations with Argentine companies. Here the prescribed maximum amounts vary also according to vessels’ age and tonnage, ranging from 450 000 ECUs to 2 430 000 ECUs for joint ventures (other types of subsidies were also prescribed for temporary associations between European and local companies allowed to operate in Argentine waters). For ships that operated under these arrangements in the 1990s, it has been estimated that total subsidies were in the amount of 80.5 million ECUs or 96 million US dollars to joint venture and temporary enterprises.

Furthermore, explicit subsidies were also paid to the Argentine government for what the accord classified as scientific and technical cooperation. The amount of subsidy paid in this category was in the sum of 28 million ECUs or 33.6 million dollars.

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<sup>13</sup> See Centro de Estudios Ambientales (CEDEA), “Environmental Impacts of Trade Liberalisation and Policies for Sustainable Management of Natural Resources: Draft Report for Country Study on Argentina’s Fisheries Resources” Report presented at UNEP’s ETU Meeting on October 2000.

<sup>14</sup> Regulation (CEE) No. 3944/90 of the European Council of December 20 1990 and Regulation No. 4028/86 as quoted in Godelman E. et.al. op cit..

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Therefore, just for EU-Argentina joint venture of one sort or another, a total of 230 million US Dollars of subsidies can be identified for the 1990s. These were subsidies paid solely by the EU to enterprises with European capital for distant water access of its fleet.

These are estimates based solely on explicit (budgeted) subsidies deriving from European Community norms and records from the European accounting office (Godelman, et. al. 1999). However, these calculations do not include other types of international (i.e. non-Argentine) subsidies. For example, cross-sectoral subsidies for shipbuilding have been identified, indicating that this is a highly subsidised activity in OECD countries. Therefore, a series of national (or even regional and provincial in the case of Europe) subsidies for shipbuilding and infrastructure have been identified such as: construction subsidies, export credits, tax exemptions, or fiscal benefits. Infrastructure subsidies have also been recognised in the areas of fishing ports construction and maintenance.

The amount of the above mentioned subsidies have been impossible to fully identify yet at the global level, but are extensive. Some of the

**Figure 1**  
**Government Financial Transfers**  
**to Marine Capture Fisheries in Selected OECD Countries**  
**(in million of US\$, 1997)**

Country/Trade Block	Infrastructure	Management research, and enforcement, and Access to other countries waters	Decommissioning of vessels and licence retirement	Investment and modernisation	Income support and unemployment insurance	Taxation exemptions	Other	Total	
<b>E U</b>	67	592	245	288	144	4	3	91	1434
<b>Japan</b>	2165	628	-	25	21	-	-	107	2946
<b>Korea</b>	164	73	-	30	-	-	-	72	342
<b>Spain</b>	16	37	-	196	80	-	-	15	345
<b>TOTAL</b>	2412	1330	245	539	80	4606	3	285	5067

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subsidies can be inferred from other data collections. Estimates of government financial transfers to marine capture fisheries in OECD countries that operate in Argentine waters<sup>15</sup> have been accounted for at the following levels (in US Dollars millions for 1997)<sup>16</sup>:

The EU, together with Japan, Korea and Spain, account for 80 per cent of all budgeted subsidies for ocean fisheries in OECD countries. Even if all of these subsidies are neither perverse nor all underpin intervention in Argentine fisheries, it can be clearly seen that some of the most subsidised fleets operate either directly or indirectly in Argentine waters.

Spain, being the largest fishing fleet of the EU, is a key nation-state for setting European policy as well as for receiving the greatest amounts of subsidies. Forty-six per cent of EU subsidisation to its total fleet went to Spanish vessels in the period 1994-99, while 80 to 90 per cent of European financial transfer for the support to foreign access agreements was transferred to this country and its fishing industry (European Commission, 1998; Porter, 2000). Average value-added and jobs generated by agreements for foreign access indicate that 80 per cent of the economic benefits went to Spain (IFREMER, 1999).

Spain is a net importer of fish and fish/seafood products, and Argentina has been in recent years the second largest source (after Morocco) of these kinds of products entering the Spanish market from waters outside the EU<sup>17</sup>. Spain is, of course, the main recipient of total Argentine fisheries products. The second generation agreement signed between the EU and Argentina in the 1990s is also highly skewed to benefiting Spanish vessels and enterprises. In a survey as of late 1998, it has been found that 82 per cent of all vessels benefiting out of joint venture and joint enterprise subsidies arrangements were of Spanish origin (IFREMER, 1999).

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<sup>15</sup> The most important foreign capital in the sector comes from Spain, but there is also Japanese capital (in surimi fisheries); South Korean capital (squid), Norwegian capital (squid and longlines), plus capital from the US and China. Fishing permits are periodically granted to foreign flag vessels, mainly from Japan, China, Korea and Taiwan.

<sup>16</sup> Extracted from OECD (2000).

<sup>17</sup> "Spain Annual Seafood Report" AGR Number: SP5039, U.S. Embassy, Madrid, 1995.

## B. Subsidies from Asian Countries

The situation vis-à-vis subsidies and fleet from Asian countries is not as clear. The main assessments have been carried-out for European capitals (that is, in direct relation to Argentine fisheries). And the main type analysed is quantifiable budgeted subsidies in the form of funds transferred for access to other countries' waters. However, this practice is not obvious in Asian countries, which hence have not been studied from this perspective as fully as the EU agreement in relation to fisheries in Argentina. Since subsidies are not transferred to joint venture enterprises, information is not as easily quantifiable, nor are they properly reported and therefore not as transparent.

Asian fleets (from Japan, Korea, China and Taiwan) are generally granted permits to fish squid in Argentine waters in exchange for fishing fees. As these countries' markets are practically closed to Argentine products, the strategy adopted by Argentina has been to open its fisheries for Asian distant water fleets. The degree of subsidies involved for these countries have not been reliably evaluated; yet in them the shipbuilding industry is highly subsidised. The development of specialised and highly efficient vessels (squid jiggers) in Asian countries has encouraged specialisation in squid harvesting. Distant water fleets from Asian countries operating in Argentine waters and harvesting squid vary in the period analysed since fishing rights/permits are temporary. Yet, each vessel typically pays a cannon of 150 to 200 thousand US dollars per year, which for the end of the decade entailed some 10 million US dollars yearly in income. The degree of subsidies for foreign access for the Asian countries involved is not reported, yet the literature indicates that these governments do subsidise foreign access (Milazzo, 1997)<sup>18</sup>.

In the case of Japan, a strong direct transfer to Argentina has also been present in the form of co-operation funds for research, technology development and collaborative analysis with Japanese organizations. These have been instrumentalised directly and indirectly from Japan via grants from the World Bank financed by the Japanese Government, JICA, or the Overseas Fisheries Cooperation Foundation, among other sources.

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<sup>18</sup> For example, just for Japan it has been calculated that the Fisheries Agency of Japan (FAJ) spends 100 million US dollars per year on distant—water dealings.

## SUBSIDIES IN ARGENTINE FISHERIES

There are many other sets of subsidies that are implicit or not budgeted. The concrete magnitude of these transfers at the global level has been estimated, but is impossible to determine at the time (Milazzo, 1997). Yet it can be stated that, for the foreign fleets and enterprises operating in Argentina, several prevalent unbudgeted or implicit subsidies, such as subsidised lending, tax preferences, fiscal benefits, export support, and others exist<sup>19</sup>.

### 5. Domestic subsidies

Domestic subsidies are even more intricate to unravel, considering that many of them are not explicit in Argentina. Also, many of these transfers are not domestically defined as subsidies, but are just characterised as “incentives” in policy-making, creating diverging interpretation in local debates as to which are subsidies or not. Furthermore, no study to date has fully analysed the issue in relation to fisheries. Therefore, there is no absolute quantification as to the amount involved or as to the actual real disbursement by government of subsidies prescribed by norms.

Although the levels of subsidies are not nearly as great as those applied in developed countries and are non-actionable under WTO rules due to their characteristics, the fishery industry operating in Argentina with different capital origins has received a series of explicit and implicit subsidies as well as natural resource subsidies in the 1990s.

These incentives are both general subsidies (production incentives provided to the fisheries industry and other industries) as well as subsidies specific to fisheries.<sup>20</sup> These occurred during the period analysed and they were:<sup>21</sup>

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<sup>19</sup> For example, for fleets and capital operating in Argentina’s fisheries (EU, Spain, US, Norway and Japan) subsidised credit has been recognised for fishing endeavours. Tax preferences have also benefited this industry from the countries operating in Argentina (in addition to the countries mentioned, also fishing industry originating in Taiwan receives this type of unbudgeted subsidy). See Milazzo, 1997. One of the major areas of tax preferences has been fuel tax.

<sup>20</sup> For this analysis, reimbursement or remittance of national taxes to the producer of exported products has not been considered a subsidy, given that this is a mechanism used to avoid export taxes.

<sup>21</sup> According to the Government of Argentina, and following the definition of subsidy and guidelines set by the WTO’s Subsidies and Countervailing Measures Agreement,

*(Continued on next page.)*

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1. Reimbursements for fisheries processed products exported.
2. Reimbursements for exports from Patagonian harbours.
3. Fuel tax subsidy for Patagonian activities.
4. Natural resource subsidies.

Several general and specific subsidies will be analysed individually, and implicit subsidies will be explored. The level of application of each will also be determined whenever possible. For this purpose, subsidies will be defined as governmental transfers (direct or indirect / budgeted or unbudgeted) to the fisheries industries or funds which should have been collected for fisheries exploitation and the state has forfeited.

### A. Export promotion: Reimbursements for exports from Patagonian harbours, for on-board processed products and others

From 1983 onward, a special system for refunds of exports through Patagonian harbours<sup>22</sup> has been in place, with an increasing percentage of reimbursement the further South is the port's location. The reimbursement applied to all fisheries products until 1996, and from then on only to products processed on land. The mechanism used is a payment by Customs to exporters on the basis of FOB export value declared for products in natural state or manufactured in the Patagonian region. The total sub-

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*(Footnote 21 continued.)*

many of these economic instruments are either not definable as subsidies or definable as subsidies admitted under the WTO. The Argentine Government states that these subsidies cannot be challenged multilaterally (and they have not been) nor be subject to countervailing action. That is, they are non-actionable (or "green") due to their characteristics, such as their assistance to disadvantaged regions, applied by a developing country. Although some are export subsidies, the amounts fall within prescribed specifications. (Communication of the Ministry of Foreign Affairs, International Trade and Religion to CEDEA, February 5, 2001).

It is presumed by WTO rules that these types of subsidies are considered extremely unlikely to cause negative effects or are considered to be of particular value and not to be discouraged. That is, they are not actionable under WTO rules because in theory they are beneficial and not perverse subsidies.

<sup>22</sup> These subsidies were instrumented by several subsequent norms, such as: National Law No. 23 018 and National Law 24 490. Although these are generally applied to all products, in 1996 the Executive Power contended that since resources are extracted from the ocean they are not Patagonian per se, and this decision was upheld by the Supreme Court (Circular de Aduana Nacional No. 1229/96). A more recent norm re-established subsidies but only to those products elaborated on land (i.e. not on board).

## SUBSIDIES IN ARGENTINE FISHERIES

sidisation, including all products and not only fisheries, was 92 million dollars per year.<sup>23</sup>

Although the exact direct impact of this subsidy is impossible to determine given the multiple variables involved, it should be noted that export-oriented fish and seafood production was one of the most dynamic components in the Patagonian region, and a major growing element in total exports from that area in the period analysed. From 1988 to 1993, the Patagonian provinces experienced a growth in their exports of fisheries products of 275 per cent, while during the same period all exports (including fish products) from this region increased 141 per cent. In comparison, in the only non-Patagonian province with maritime coast (Province of Buenos Aires) exports only grew 31,6 per cent.<sup>24</sup>

Other programs for general export promotion have been implemented throughout the decade here analysed (either in semi-permanent levels or sporadically) involving financial support, promotion through trade missions and partnerships between public and private sectors. For example, the PROMEX project for the export of non-traditional products was created in 1992 with the goal of increasing Argentine exports of non-traditional agricultural products (such as fish and fish products) in foreign markets.<sup>25</sup> The program activities included funding for enterprises to participate in exhibitions and/or commercial fairs in order to boost non-traditional agricultural product exports. Throughout the 1990s, federal government also offered credit lines to several exporting complexes, among them the fisheries industries, mainly in order to promote exports.

Specific export subsidies in the form of reimbursements for the fishery industries have oscillated between 0 and 10 per cent depending on products without taking into account harbour of origin. Export promotion reimbursements vary from year to year and from product to product.

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<sup>23</sup> Government of Argentina (1996), "SUBSIDIES NOTIFICATIONS PURSUANT TO ARTICLE XVI.1 OF GATT 1994 AND ARTICLE 25 OF THE AGREEMENT ON SUBSIDIES AND COUNTERVAILING MEASURES" World Trade Organization, Committee on Subsidies and Countervailing Measures, G/SCM/N/3/ARG. 25 March.

<sup>24</sup> "El Sector Pesquero Argentino: Informe General (Preliminar II)" Universidad Católica Argentina, November 1999.

<sup>25</sup> This program, as many of the type, have been financed by loans from the World Bank and the Inter-American Development Bank. It has been reported that other financing of export promotion schemes (in particular fairs participation) has been through funds received via the EU—Argentina accord current until the late 1990s and slated as funds for scientific and technical co-operation in the international agreement.

From the mid-1990s these are applicable to on-land processed products (not processed on board).<sup>26</sup>

### B. Fuel tax subsidy for Patagonian activities

Fuel tax has been subsidised during the preceding decade for all Patagonian activities. Although, as in other cases presented here, it cannot be said that fuel tax subsidies in this region have been exclusively used for fisheries activities, fisheries exploitation is one of the main endeavours of this regional economy. Fuel taxes have been subsidised in the 1990s, through a tax exemption granted to fuel sold in Patagonia.

### C. Natural resource subsidies

Subsidies on the use of resources themselves have been identified in previous studies on fisheries subsidies. This occurs when access to fleets is granted at a very small portion of the catches' commercial value.<sup>27</sup> That is, the removal of a publicly owned natural resource, such as fisheries, is being extracted with little or no cost to the industry.<sup>28</sup>

In the case of Argentine fisheries, rent extraction mechanisms for the exploitation of fisheries resources has been practically non-existent in the period analysed. Only few funds have been levied from licences or from other sources in relation to the value of the product. Not even catch fees have been levied until recently, although they are indeed contemplated in norms current during the last decade.<sup>29</sup>

<sup>26</sup> Resolución No. 420/1999; Resolución 967/1999, Resolución 257/2000; Resolución 1004/2000 and others.

<sup>27</sup> See Gareth Porter, *Fisheries Subsidies Overfishing and Trade*, Environment and Trade 16, United Nations Environment Programme, August 1998.

<sup>28</sup> Some nations have estimated that 15-20 per cent of the commercial value of catch should be levied as fees, in order to share the economic rent of natural resources (Porter. *op cit*). In the case of Argentina, however, the State tends to oppose levying such a high level of rent extraction mechanism.

<sup>29</sup> Catch fees have only been implemented since early 2001, for an estimated total income from fishing rights that will amount to some USD 11 million at the national level (i.e. not including provincially levied—fees which amount to some US 6.5 million a year). They have met with opposition of industry. At the same time, international concern has been expressed, because the non-application of fees has been interpreted as hidden subsidies to the Argentine fishing industry in comparison with caputre fees already implemented in most countries around the world. (Source: [www.fis.com](http://www.fis.com)).

## SUBSIDIES IN ARGENTINE FISHERIES

Some conservative estimates indicate that fisheries income should recuperate, at least, the costs of control, surveillance, administration, and research, even when not dealing with any net revenue. In the case of Argentina, the amount of management costs recovered from fees and royalties only covered an estimated 14.5 per cent of the annual fisheries management budget for some periods of time. This indicates that an annual subsidy of 15 million dollars to the industry can be identified solely in the area of management for certain years.<sup>30</sup>

In the Argentine case, as in most if not all intensive natural resource use instances, a strong natural resource subsidy is present. The commodity's price is distorted due to the market failure that neglects the full-cost accounting of the natural resource.

### D. Other Subsidies

Other subsidies identified, following internationally agreed categorisations to date, are:

- employment and other social benefits for people employed in the fisheries sector, and
- worker retraining programs.

## 6. Impact Assessment

The incidence of subsidies on fisheries has been moderately explored in the literature. A crucial question to be answered in this particular case is as follows: What are the effects that subsidies have had on Argentine fisheries?

Overall, important changes occurred throughout the period of deep transformation that fisheries industries have had in Argentina. These can be summarised as follows:

Positive and negative impacts have been weighed in a cost-benefit analysis for one specific species (*Merluccius hubbsi*, or Argentine hake, the most exploited and most near stock collapse). This examination

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<sup>30</sup> See Schonberger and Agar (1999) where it is estimated that for 1996, when Argentina's gross fisheries product was in the order of 1 500 million US dollars, only 4.3 million US dollars were recovered for management purposes when the annual fisheries management budget for that year was roughly 30 million US dollars.

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<b>POSITIVE IMPACTS</b>	<b>NEGATIVE IMPACTS</b>
Increase in fisheries production;	Degradation of fisheries biomass;
Increase in exports;	Negative ecosystem impact (removal of primary and secondary productivity);
Increase in employment in some areas (Patagonia and harvesting activities);	Increased costs for fisheries regulation and control;
Improvement and growth of the fisheries fleet;	Increased operation costs;
Technological innovation in the sector;	Increasing fishing effort;
Increased research facilities and skills;	Fiscal costs (subsidies)
Opening of new markets and trade exchanges;	Corruption practises;
Increase in public income;	Non diversification of catches;
Regional infrastructure investments (ports, other infrastructure, new firms, etc.)	Investment oversizing (overcapitalisation of fleets, ports, etc.);
	Increasing unemployment in some areas (Buenos Aires and processing activities);
	Decline in work conditions;
	Social unrest

determined that policy as carried out in the preceding decade had a direct net cost for the economy of about US 500 million dollars (CEDEA, 2000).

The direct impact of subsidies per se cannot be differentiated from other practices leading to overfishing. This is a condition for all countries' fisheries, including the Argentine ones. However, although it is not possible to determine whether subsidies are the cause or the effect of mismanagement, there is no doubt that they exacerbate the situation leading to overfishing and mismanagement of marine resources.

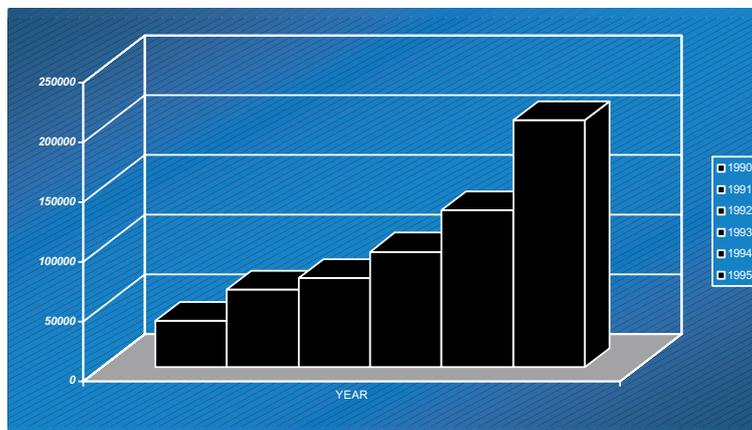
In inferring causality, an instance where there can be a clearer link is the area of overcapitalisation (the Argentine case being a reflection of the same situation in the global fishery industry). For example, direct budgeted subsidies for distant water access was one of the tools used in the EU-Argentine agreement as well as in other agreements in the 1990s. Consequently, while ice trawlers and coastal ships roughly maintained their total horsepower, freezer boats with much larger capture potential greatly increased their capacity from about 39 000 HP in 1990 to 207 000 in 1995

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(See chart below).<sup>31</sup> Freezer ships began to operate almost exclusively in waters under Argentine jurisdiction via the EU—Argentina agreement and other norms of this time type signed with the European Union in the early 1990s. They received direct budgeted subsidies for distant access to Argentine waters.

In the Argentine case, overfishing has been reported in up to 111 per cent of Total Allowable Catch (TAC)<sup>32</sup> for some years. When captures of *Merluccius hubbsi* species (the main fish species captured and an essential indicator) are analysed for 1997 and 1998, harvesting appears to have greatly exceeded TAC. For 1997, the maximum capture was set at 395 000 metric tons, yet official landing reporting reached over 584 000 tons. The reported landings only, thus, are 47 per cent beyond maximum prescribed capacity. This is a rather conservative figure, which falls short of reality given that it does not take into account by-catch, discards, nor un-reported landings. When these types of catch are estimated, and high seas landings are added, it is found that total estimated catch for hake for 1997

**Figure 2**  
**Total Horsepower of Freezer Ships Operating in Waters under Argentine Jurisdiction (1990 - 1995)**



<sup>31</sup> Godelman, et.al., 1999.

<sup>32</sup> Total allowable catch (TAC) is a sort of normative figure established by public control agencies that, in theory, should be comparable to MSY.

reached 834 000 metric tons in waters under Argentine jurisdiction. This is more than twice the amount of prescribed maximum capture (111 per cent).<sup>33</sup> For 1998 the same pattern continues. Due to decreasing stocks, TAC for *Merluccius hubbsi* was lowered to 289 000 metric tons for that year. Yet reported landings greatly surpassed that amount again, with accounted for capture reaching 395 000 tons. This is 36.6 per cent greater than maximum prescribed capacity. The pattern is quite similar with other species.<sup>34</sup>

## 7. Conclusion

The analysis of fisheries subsidies and their relation to sustainable development still lacks many pieces, not the least being working definitions accepted by all parties involved. First, a thorough analysis is missing on what is the amount of subsidies involved today in fisheries exploitation, including a whole set of non-budgeted or non-evident subsidies that must be taken into account.

The failure by states to recuperate the full economic rent in trade of publicly owned resource rights is one of the most pervasive issues in natural resource exploitation and subsidies, and one of the most difficult ones to unravel at this stage. As it has been pointed out, subsidising natural resource production through the sale of access at such a low price that the rent is transferred from the state to the producer, is one of the most ubiquitous forms of subsidies in natural resource exploitation, including fisheries exploitation<sup>35</sup>. This has been the case in Argentina.

Furthermore, the impacts of subsidies on sustainable development appear to be analysed differently from “where one stands” and even from confined or localist analysis. Further global analysis on this issue needs to be done, especially on subsidies which are sometimes classified as “good” subsidies when perceived as having positive environmental impacts. Two instances of unsound classification of “good” subsidies can be found in the Argentine case. First, the European subsidies employed for access to distant waters (in the case of the EU—Argentina agreement as well as previous agreements of the type) were categorised as positive subsidies given that they reduced pressure on natural resources in European waters. Nevertheless, as can be seen in this case,

<sup>33</sup> See Godelman, et.al. (1999); Schonberger and Agar (1999) and CEDEA (2000).

<sup>34</sup> World Bank, 2000, *Country Assistance Strategy*.

<sup>35</sup> See Porter, 1998.

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the outcome has been a transfer of the problem of overcapacity to distant waters.

Another subsidy catalogued as positive is the use of government funds for vessel buy-back schemes in order to reduce capacity, an example of which is the Canadian buy-back scheme for the closed cod fishery. Nevertheless, this program shifted excess capacity from one region to another, because vessels retired from this type of exploitation were sold to other countries. These were mainly developing countries, among which Argentina.

More generally, from an analytic as well as from a policy setting point of view, work still needs to be done regarding the impacts of subsidies on the use of marine fisheries. Nevertheless, it is now clear that subsidies play a negative role in overfishing practices, in Argentina as well as in many other countries.

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## Support Policies to Senegalese Fisheries

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### 1. Introduction

The history of State support to Senegalese fisheries divides into several main periods with differing impacts on the fisheries' economic, social and environmental sustainability. In the first of these periods, lasting approximately from Independence to the end of the 1970s, government policy was one of active support to the sector, taking the form of projects designed to promote industrial fishing. This policy failed for

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reasons relating essentially to the dynamics of small-scale fishing, but in a context of financial crisis precipitated by indebtedness it could not have been continued in any case. Paradoxically, these subsidies, whose impact on the environment should have been extremely negative, proved in the end to have had but little effect. In theory, support to the capture component of fisheries through aids to boat construction should normally have a direct effect on the equilibrium of stocks. The resulting higher capitalization is not a consequence of general measures of support but, rather, the goal that the interventionist projects directly seek to attain. But in order for the risk of imbalance to become clearly pronounced, the principal effect sought—improved profitability of equipment that otherwise could not stand up to national and international competition—must first have been attained. This clearly did not happen because small-scale fishing, while receiving proportionally far less support, remained competitive enough to slow down the industrial sub-sector's development. Projects implemented under this policy were not sufficiently long-lived to bring about social or environmental changes of any importance. If anything, their main impact, albeit negative, was an economic one, the repeated failures of government interventionism leading to inappropriate allocation of investments at the national level.

In the second period, starting around the early 1980s, government support was at first reduced for reasons of structural adjustment and then switched from direct interventionism focused on the capture component to support mechanisms intended to encourage exports. Free-trade zone and duty-free export company status, the Lomé Convention, export subsidies, fisheries agreements and devaluation all contributed significantly towards tying the sector more and more firmly to foreign markets. While reducing its interventions and modifying their nature, the State also gave greater attention to the sector's development and to channeling support in a direction more favourable to small-scale fishing, the sector's main driving force. A number of mechanisms were set up in support of the modernization of small-scale fishing, until then in the hands of the fishermen themselves. Subsidies for motorisation and for the adoption of new fishing equipment (purse seine) were introduced in this context.

The consequences of these policies in terms of the fisheries' sustainability are ambiguous. On the one hand, small scale fishing has the built-in advantage of employing a larger workforce as well as of supplying the population with the animal proteins it requires and of selling the bulk of its output waste-free. While it is not easy to distinguish between the respective impacts of the growth of foreign demand, innovations introduced by the fishermen themselves and those resulting from government

intervention, all in all the 1980s and 1990s were undoubtedly a period of maximum growth of small-scale fishing. On the other hand, closer analysis reveals that the boom in small-scale fishing did not necessarily achieve all the anticipated results in terms of the fisheries' sustainability.

While small-scale fishing, by employing nearly 15 per cent of the working population, clearly contributed significantly to reducing unemployment, it did not offset the main problems arising from the increase in exports of sea products—the threat of biological depletion of the species exported and of a breakdown in the supply of cheap protein to the population. Many small-scale fishermen have, in fact, switched their activities to species of high market value, with the result that today they account for about 60 per cent of the raw material supply of the country's exports units.

The Senegalese fisheries sector plays a significant role in foreign trade, food security and employment, three areas that are crucial national issues. The importance of all three places a constraint upon any approach to subsidies that would focus exclusively on their environmental consequences and ignore their contribution to certain strategic areas of national development. On the other hand, the threat that certain support mechanisms represent to these or other equally strategic areas seems propitious to the adoption of sustainable compromises. *Mutatis mutandis*, the study of subsidies to Senegalese fisheries does not confine itself to analysing their environmental consequences but also addresses their positive or negative contribution towards the sector's sustainable growth within the set of constraints determined by its social functions.

## **2. Until the 1980s: direct support to production, at first industrial, then small-scale**

In its implementation programmes the State developed a policy of gradual substitution of industrial vessels for small-scale fishing. This policy was articulated around attempts to build a national tuna fleet and the introduction of new forms of coastal pelagic and demersal fishing. So far as the tuna-fishing industry was concerned, the *Société sénégalaise d'armement à la pêche (SOSAP)* was set up in 1962, becoming operational from 1965. After a number of setbacks, due partly to inappropriate technical choices and poor management as well as to the stepping up of international competition and the subsidising of their own fisheries by developed countries, this company was liquidated in 1976, having swal-

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lowed up most of the State funds earmarked for the fisheries sector. To this should be added some difficulties met with in connection with demersal fishing, the implementation of a trawl-fishing project forming part of the policy of replacement of traditional pirogues by semi-industrial boats (Kebe, 1991). This attempt likewise failed, the trawlers proving unable to compete with small-scale fishing<sup>36</sup>. The authorities then tried to align small-scale fishing upon the industrial model, as attested by the project of modernization of coastal pelagic fishing aimed at replacing small-scale boats by industrial-type sardine boats. This again proved unsuccessful. While it can be argued that lack of experience on the part of managers and crews (recruited from among traditional fishermen) was partly responsible for this failure, the main cause would seem to have been the inability of industrial fishing to compete economically with the small-scale sub-sector.

Despite the interest in small-scale fishing shown by the Government of newly independent Senegal, the fact remains that the chief beneficiary of successive plans for the sector's development was industrial fishing. The first two four-year plans were devoted principally to building a tuna fleet; the third clearly favoured industrial fishing; the fourth (Domingo, 1982), in allocating to the small-scale sub-sector a mere 14 per cent of funds earmarked for the fisheries sector, represented an increase in the latter's share of State funds.

While industrial projects thus succeeded one another, pirogue fishing nevertheless underwent considerable change, the small-scale fishermen adjusting rapidly to the new operating conditions. These successive adjustments enabled small-scale fishing to achieve significantly better output rates and consequently to increase its output. Production rose exponentially from some tens of thousand tonnes in the 1970s to almost 350 000 tonnes in 1997 (as compared with industrial fishing, which peaked at 130 000 tonnes). This success was naturally taken into consideration by the authorities, which switched their interventions to the small-fishing sub-sector and, in particular, to equipment and marketing.

As regards equipment, the State initially sought to generalize the use of boat engines by making its loans conditional upon the fishermen's forming co-operatives, which were supposed to manage the funds received. The debt repayment crisis of the late 1960s precipitated the

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<sup>36</sup> It should be noted that the labour productivity of small-scale fishing is as high as that of semi-industrial fishing although its capitalisation is lower.

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failure of the earliest of these co-operatives. This first stage ended with the cancellation of non-reimbursed debts, undoubtedly the largest subsidy ever granted to small-scale fishing (or programmed in its respect). The second stage of motorisation involved the setting up of the *Centre d'Assistance à la motorisation des pirogues* (CAMP) in 1972. This body, established thanks to Japanese co-operation, was more fully equipped to achieve financial equilibrium. The fishermen, long convinced of the usefulness of engines, proceeded to generalize their use. The spread of the new technology was due to the availability of new resources rather than to reorganization of the cooperative system. Intervention at State level continued with the introduction of the purse seine. Following a successful demonstration by FAO in 1973, the number of purse seine units rose rapidly from 120 in 1977 to 230 in 1981, 265 in 1983 and 303 in 1989.

As regards support to marketing, the 1962 project to establish the sales cooperative of Dakar-Marée was a repetition of the Coopmer venture of 1954. Once again, the project failed to organize the fish and seafood wholesalers, who found it more advantageous to operate outside a State-administered system. The CAPAS (*Centre d'assistance à la pêche artisanale du Sénégal*) project was launched in 1978 with the aim of marketing fish through fishermen's cooperatives. Because of its limited size, however, the project could not hope to handle more than 10 per cent of landings and therefore could not exercise an appreciable influence on prices. Another part of the project (supplying the interior of the country from three centres, Joal, Kayar and Rufisque) was hampered by the high maintenance costs of the refrigeration chain. The project as a whole ran into the same difficulties as its predecessors: that of persuading the fishermen to join an organization "imposed from outside", that of relations between the organization and the wholesalers, and that of the low level of prices offered to the fishermen (Chauveau, 1984). The CAPAS marketing operation was finally abandoned in 1987. After a period of joint management, the centres were to be handed back to the fishermen's cooperatives. The State is currently evaluating the assets before effecting the transfer.

State action was then oriented towards the construction of secondary ports and roads, but expansion continues to be fuelled by endogenous changes such as restructuring of the wholesale fish trade towards greater marketing flexibility, the boom in traditional processing, technical innovations, etc.

### **3. The present: support to small-scale fishing and mechanisms in support of exports**

After a period in which advantages were offered to industrial production, the State gradually turned to policies of support to the small-scale sub-sector, first by means of direct interventions in favour of the capture component and later through mechanisms in support of marketing, particularly for export. Today, the State's financial assistance to fisheries, both direct and indirect, can be summed up as follows:

- Modernisation assistance through the creation of infrastructures (fishing wharves, Central Fish Market), a policy of tax reductions on fishing equipment (motorisation), fuel subsidy, setting up of structures to finance the sector);
- Assistance to marketing (support to the fish and seafood trade, export subsidy, devaluation, Lomé Convention, alignment with international standards, duty-free export companies, fishing agreements) aimed at achieving greater competitiveness and a stronger penetration of foreign markets by Senegalese sea products;
- Assistance to small-scale processing.

#### **A. Support to modernisation**

##### *Policy of tax reductions on engines and fishing equipment*

The spread of the use of outboard engines in small-scale fishing, which began in the 1950s, reached its peak in 1965 when CAMP was selling engines tax-free and on easy terms. The impact of motorisation was considerable from both the technical and the economic points of view. The use of engines appreciably extended the capacity of small-scale fishing vessels by enabling them to reach previously inaccessible distant fishing areas. It greatly reduced travel times and substantially extended the time available for actual fishing operations. It encouraged migration of Senegalese small-scale fishermen along the coasts of the West African sub-region and the development of distant fishing. There can be no doubt that the introduction of the engine in small-scale fishing has been the main factor in promoting the enlargement of pirogues, thereby facilitating their adaptation of new fishing techniques such as purse seine.

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Today it is safe to say that motorisation is close to 90 per cent and includes all pirogues that could be motorized with a reasonable degree of profitability. The cumulated amount granted by the Government in annual tax reductions for the purchase of outboard engines is CFA francs (CFAF)<sup>37</sup> 2.01 billion.

Despite the adjustment measures taken, motor fuel remains by far the most important item of intermediate consumption by motorized fishing units, accounting for about 50 per cent of their total costs. In the interests of energy-saving, the public authorities invited Japan to design diesel engines suitable for the operating conditions of Senegalese small-scale fisheries. The dieselisation project was launched in 1994 as part of Japanese non-refundable financial cooperation. CAMP received 100 27 HP diesel engines to be sold to fishermen. This project suffered from major constraints due essentially to technical shortcomings—low engine power, shortage and high cost of spare parts, difficulties with the supply of tax-reduced diesel oil, lack of specialized repairs mechanics and poor after-sales service.

Large resources of small coastal pelagics (sardinella, scad, *pelon*) in coastal waters, hitherto little exploited by small-scale fishing, strong demand for cheap fish and the successful introduction of encircling nets in the 1960s encouraged the Government to promote the use of purse seine. Following conclusive tests conducted in the early 1970s with the assistance of FAO, the new technique became widespread from 1973 onwards. This was, after motorisation, the second major technical breakthrough in pirogue fishing since 1960. Its consequences are enormous, as follows:

- Unprecedented growth of landings, resulting in the development of fresh fish marketing and of the small-scale braising industry (*kéthiakh*), particularly on the *Petite Côte*;
- Technological effects of the construction of large pirogues capable of carrying large catches (up to 20 tonnes).

Annual tax reductions granted in connection with the replacement and/or purchase of purse seine nets amount to CFAF 0.6 billion.

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<sup>37</sup> On 10 January 2002, CFAF 1 billion equals EUR 1,524,490 as well as US\$ 1,354,055.

*Fuel subsidy*

This subsidy has been a decisive factor in the modernization of fishing equipment, facilitating the use of more powerful engines, contributing towards the enlargement of pirogues and helping to prolong sea trips and to open up new fishing areas. It considerably reduces the working costs of fishing units, thereby (in theory) keeping the price of fish caught by small-scale methods at levels compatible with the purchasing power of the Senegalese population. However, the orientation of the small-scale sub-sector's activities towards the export market makes it legitimate to wonder whether the ultimate beneficiaries of this form of government support are not a handful of industrialists and the foreign consumer.

The fuel subsidy to small-scale fishing alone rose from less than CFAF 2 billion in 1986 to over CFAF 6 billion in 1998 (see Table 1 in Annex).

*Policy of funding activities*

1. Small-scale fishing: Caisse Nationale de Crédit agricole du Sénégal (CNCAS)

As a development bank—the role for which it was originally intended—CNCAS plays a preponderant part in funding all rural activities and functions, including fishing.

CNCAS has been closely involved in funding the fisheries sector, first from its own equity and later through managing the credit lines of certain development projects involving small-scale fisheries, including the credit components of the Petite Côte small-scale fishing development project (PAPEC), the Ziguinchor small-scale fishing development project (PAMEZ) which later became the project for the support of small-scale fishing professionals of Casamance (PROPAC), the project for the support of mutual savings and credit companies in Senegal (PAM-ECAS), and funds generated under the recent fishing agreement in support of the small-scale sub-sector concluded with the European Union.

We must point out, however, that despite corrective measures taken, interventions by CNCAS on behalf of small-scale fisheries have suffered from the outset from serious shortcomings. This inappropriateness is reflected in the smallness of the fund's portfolio, which has not risen above CFAF 3.2 billion in ten years of intervention in the sector. The difficulties encountered include the following:

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Conditions of access to credit, considered restrictive. The introduction of a self-financing requirement for borrowers is perceived as discriminatory and the 12.5 per cent annual interest rate is thought excessive considering that CNCAS pays less than 4 per cent interest on its credit line;

Difficulties of loan recovery due to producers' insolvency; lack of permanent guarantees; after-effects of the co-operative credit system which preceded the CNCAS intervention; fund releases at unsuitable moments (off-season); and the fact that many of the fishermen do not have bank accounts.

### 2. Industrial fisheries

The *Fonds de Promotion Economique (FPE)*, set up in 1991 as part of the national policy of encouragement of the private sector, is organised on the basis of three funds:

- An "economic advancement" fund, which is a credit line of CFAF 39 billion made available to the Senegalese Government by the African Development Bank (ADB) for the re-financing of banks for small and medium-sized enterprises (SME) (loans corresponding to 70 per cent or less of project cost; maximum rate of interest 13 per cent; opening fee 1 per cent; maximum loan repayment period, 15 years with possibility of extension by a further 5 years);
- A guarantee fund (to cover risks involved in lending to SME);
- A "participatory loans" fund of CFAF 3 billion set up by the State to offset inadequate equity of entrepreneurs.

Compared with other sectors of economic activity, FPE funding of industrial fishing projects is relatively limited (a little under 8 per cent of CFAF 3.5 billion between 1991 and 1995). That this funding corresponds to approximately 40 per cent of all investment programmes executed under this head reflects the high level of self-financing (60 per cent) and clearly demonstrates the difficulties experienced by fishing companies in financing their investment needs.

#### *Construction of fishing wharves*

Except at Hann, Joal and Rufisque, hygienic conditions at landing areas in Senegal's major small-scale fishing centres are far from satisfactory. Catches are deposited on the sand to await buyers, so that the risk

of contamination is very great. No parking lots or packaging areas are available to wholesalers.

Faced with these constraints, the public authorities embarked upon a programme of construction of landing wharves in the main sea-fishing centres (Saint-Louis, Kayar, Yoff, Soumbédioune, Toubab Dialao, Yenne and others). The construction of concreted selling areas is seen as a first step towards the creation of proper auction markets, while the construction of parking lots for wholesalers' vehicles is expected to improve the hygienic conditions of fish freezing and packaging operations.

#### *Central Fish Market*

The Central Fish Market *Marché central au Poisson* (MCP) was built in 1992 and became operational in 1993, its cost of CFAF 3 117 billion being financed jointly by Japan (90 per cent), the Government of Senegal (7 per cent) and what used to be known as the Urban Community of Dakar (3 per cent). Its construction was prompted by the need to improve the quality of marketed products. With its three refrigeration plants, three warehouses and three cold-rooms, the MCP ensures the preservation of unsold products and provides ice to fish traders at competitive prices. As the country's central fish market it facilitates deliveries to secondary markets and helps to regulate the fish supply in the Dakar area.

The CFM was enlarged in 1998 at a total cost of over CFAF 3 billion, financed by Japan (99 per cent) and the Government of Senegal (1 per cent).

## **B. Support to domestic and external marketing**

### *Fish trading centres and refrigeration chain*

Until the mid-1970s investments in small-scale fishing went principally to the development of "upstream" activities. The early 1980s saw the funding of some large-scale projects aimed at improving marketing conditions. The argument advanced in favour of this change was that fresh fish marketing in Senegal suffers from a number of shortcomings, *viz.:*

The absence of preservation infrastructures on the beaches puts fishermen in a weak position vis-a-vis the traders and affects fish quality at

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the very beginning of the marketing cycle. This was the rationale of the CAPAS (*Centre d'Aide à la Pêche Artisanale Sénégalaise*) project.

Inadequate guarantees offered by small-scale fish and seafood traders as regards the quality and regularity of fish supplies. This was the argument in favour of the refrigeration chain project.

### *Duty-free export companies*

Duty-free export company status was instituted by Act No. 95-34 of 29 December 1995. The main object was to boost the development of Senegalese exports with a view to reducing the gap in the balance of trade through foreign exchange earnings and the creation of local value added. Other objectives were to encourage paid employment and, to speed up the country's industrialization.

The duty-free export company is an export-oriented industrial or agricultural enterprise. The fisheries sector is included under agricultural activities. The duty-free export company, instituted for a renewable 20-year period, may be located anywhere in the national territory. Advantages arising from this status are essentially the following:

- Exemption from all duties and taxes levied on capital goods, equipment, commodities and finished or semi-finished goods entering or leaving the country;
- Exemption from VAT, customs stamps, registration and stamp duties, licences, etc.

The main conditions are: export activities corresponding to not less than 80 per cent of turnover and payment of an industrial and commercial profits tax (BIC) at a rate of 15 per cent (instead of 33 per cent).

### *Export subsidy*

The granting of an export subsidy was a political step in line with the national policy of encouraging the penetration of international markets by domestic products. Together with the value added already created by companies, this subsidy helped to pay for production factors. It enabled the exporter to offer products at competitive prices without relaying any surcharges connected with domestic factors. The social and economic benefits of this method of protecting certain areas of activity were deemed to be at least equivalent to its cost to the public purse.

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The subsidy, first instituted for agricultural products in 1980, was extended to tuna in 1983 and raised from 10 per cent to 15 per cent. A further adjustment in 1986 introduced the criterion of industrial value added into the system of determining the amount of the subsidy, extended the subsidy to all sea products and raised the rate to 25 per cent. By way of example, export subsidies to the trawler fishing industry in the fiscal year 1991/1992 amounted to CFAF 12 billion.

Following the devaluation of the CFA franc and in view of emerging possibilities of recovery of the sea fishing industry, the export subsidy was abolished by presidential decree at the end of March 1994.

### *Devaluation of the CFA franc*

The efficacy of the CFA countries' structural adjustment policies (SAP) was very limited. This was found to be the case as far back as 1989 both by the IMF, which suspended its loans, and by France, which refused to continue to support structural adjustment in the absence of an agreement between the CFA countries and the Bretton Woods institutions. The decision to devalue the CFA francs was taken in 11 January 1994.

The development partners who recommended this monetary adjustment, aware of the great importance of the issues at stake—revival of exports and restoration of the area's economic credibility—undertook to provide better support to CFA countries in their efforts to promote economic revival and to curb the undesirable effects of devaluation. In practice, this commitment took the form of the adoption of various accompanying measures.

In this context, fisheries received special attention from donors because they were thought to meet the need both for food security and for increased exports. However, one of the most strongly felt effects of devaluation was the imbalance it created between the domestic and the export market, food security being, in practice, overshadowed by the recovery of exports. The prospect of large profits on foreign markets led many operators to concentrate on exports, to the detriment of meeting domestic demand.

### *The Lomé Convention*

Since 1982, duty-free imports of African goods, and in particular of sea products, into Europe have been authorized under various sections of

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the Lomé Convention concluded between the European Community and the ACP (African, Caribbean and Pacific) countries. The dependence of these countries on the European market, already considerable, has steadily increased. Senegal is no exception, the more so as its colonial past has meant that most of its exports were in any case reserved for Europe, and more especially for France. Today, over and above the strong presence of European capital in the industrial fisheries sub-sector, over 60 per cent of exported Senegalese sea products end up inside the European Union.

### *Fishing agreements*

Senegal has concluded many fishing agreements with foreign countries, by far the most important among them being those with Japan and the European Union. Those with Japan relate mainly to tuna, while those with the European Union concern coastal demersal and, more recently, pelagic fisheries. These agreements are attracting greater attention because they involve species that are endangered or used locally, i.e. that are strategic from the point of view of food security, as well as greater quantities and larger counterpart funds. All these agreements are, in fact, disguised subsidies, since the major part of the resource access price is borne by the national authorities of the fleet authorised to fish under licence. Dues paid by European ship-owners covered by the agreements thus represent only about 10 per cent of the resource access price, the remainder corresponding to counterpart funds disbursed by the European Commission. This situation allows fleets which otherwise would probably have been forced to withdraw from what is, in Europe, a highly competitive sector to capitalize on their fishing equipment in African waters.

### *Policy of alignment to international standards*

In 1995, as part of the “Support to the Restructuring of the Fishing Industry” project, *Coopération Française* in collaboration with the Senegalese authorities initiated a policy of aligning export companies and industrial fishing vessels (freezer ships) to European standards, the European market being currently the main recipient of Senegalese sea products. A subsidy of CFAF 1.7 billion was granted to some 30 companies as a means of financing up to 30 per cent of their investments.

### C. Support to small-scale processing

Despite the economic and social importance of small-scale processing (local marketing of sea products, animal protein supply, employment etc.), the techniques used are still rudimentary and do little by way of upgrading the products. Most processing procedures involving the main products of small-scale fishing, in particular braising, are carried out on the ground, causing—inter alia—production losses and unsatisfactory product quality.

In order to remedy these shortcomings, various government bodies have been experimenting with Chorkor and breezeblock ovens. The goals pursued by all these projects are the same, namely, to improve the quality of the products processed, to extend their period of conservation and to develop new products using non-upgraded species.

The use of the Chorkor oven imposes a number of constraints on the operator. Since products obtained by this technique do not form part of the traditional diet of Senegalese consumers, they are essentially intended for export; in fact, only foreign communities have adopted this technique. The output capacity of these ovens is half of that of traditional ovens only and smoking takes up to three days<sup>§</sup> and requires careful supervision. Construction and maintenance costs are rather high and the hardwood required as fuel is very scarce and relatively expensive. However, these ovens do make it possible to develop new products and of good quality (using non-upgraded species, well-smoked, attractively coloured, less liable to bacterial contamination and with a longer conservation period).

Unlike the Chorkors, breezeblock ovens produce the same products as so-called traditional methods (*Kéthiakh*). Their output capacity exceeds those of traditional and Chorkor ovens by, respectively, 40 and 70 per cent, which amply makes up for the additional investment costs. The relatively short smoking period (2 to 3 hours) makes this processing technique better suited to one-man operation, mostly practised in this trade, as well as being easier to use. Operating costs are reduced owing to the possibility of using various wastes (millet straw, dry foliage, sawdust etc.) as fuel. Another major advantage of the breezeblock oven is that it is suitable for both braising and smoking. Furthermore, breezeblock ovens produce significantly less smoke pollution than the traditional method, causing less negative environmental and health impacts.

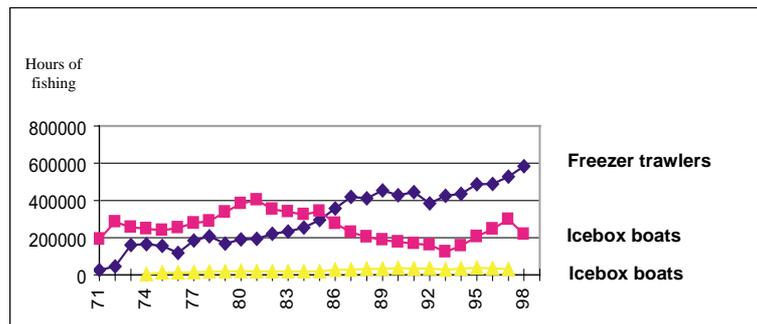
#### 4. Development of stock level indicators for the main export species

Mechanisms of support to fisheries, which since the 1970s and 1980s have been oriented towards small-scale fishing and, at the same time, towards exports, have entailed an increase in the fishing pressure exerted by trawler and small-scale fishing fleets on coastal demersals, the main species exported to markets of the North. A study relating to twenty or so demersal species, based on trawling evaluation campaigns and on fishing statistics and covering the past twenty years, has recently been completed<sup>38</sup>. It reveals a decline in stock level indicators, and more specifically in catches per unit of effort, for most of the species reviewed.

##### A. Relative stock levels based on evaluation campaigns

The evaluation campaigns were conducted between 1986 and 1995. The evaluation campaigns were conducted between 1986 and 1995. The period covered is a highly important point. The diagram below, which shows the development of the fishing effort of Dakar-based demersal trawlers, reveals that all the campaigns took place when considerable fishing pressure was already being exerted on the coastal demersal resources in question.

**Figure 1**  
**Evolution of the fishing effort of the Dakar-based demersal flotilla**



<sup>38</sup> UNEP. The Socio-Economic and Environmental Impacts of Trade Liberalization on the Senegalese Fisheries Sector, 2001.

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1986, the year of the first evaluation campaign, was also the year in which the fishing effort of freezer trawlers began to exceed that of icebox boats, which had begun to decline in the early 1980s. To anyone familiar with the icebox boats operators' strategy, this decline would seem to suggest a diminution of the stock level of the principal target species (African threadfin, sea bream, grouper and shrimp). Another explanation for the decline in the fishing effort of icebox boats, which cannot stay out at sea as long as freezer trawls, is the steadily increasing competition from freezer and deep-lying trawls. The increase in overall fishing effort has also had a considerable impact on each of the species tapped. Here, a major difficulty arises from the fact that the available data shed no light on specific stock levels prior to 1986. This lacuna can, however, be filled by undertaking an analysis of catches per unit of effort on the basis on fishing statistics.

The increase in fishing effort recorded for all flotillas in 1994 is highly indicative of the strategic adjustments made by boat-owning fishermen following the devaluation of the CFA franc.

The development of stock level indicators for species captured by deep-sea trawls during the evaluation campaigns shows a significant overall decline between the beginning and the end of the period. Almost all species were affected. Total catches (all species) for the whole of Senegal's continental shelf fell from about 1 000 kg per hour in 1986 to 500 kg per hour in 1991, which corresponds to a reduction by 50 per cent.

At the beginning of the period, the *Serranides* group, which includes all groupers (*genus Epinephelus*) showed a relatively low stock level, as the 30 kg of fish caught per hour for all species reflects. At the end of the period, less than 10 kg of fish were caught per hour. The same phenomenon is observed in the case of *Sparides*, especially the species belonging to genus *Pagrus* (*pagres*): while over 40 kg were caught per hour at the beginning of the period, less than 10 kg were caught per hour at the end.

However, the relative stock level of certain species such as octopus (*Octopus vulgaris*) rose over the same period. While less than 5 kg of octopus were caught per hour in 1986, catches reached 10 kg per hour in 1995 and even exceeded 15 kg per hour in 1994. The same is true of other secondary species, such as scorpion fish and hake, found along the edges of the continental shelf and on continental slopes.

## B. Relative stock level based on fishing statistics

Capture and fishing effort statistics for the period 1971 to 1998 are available in database form.

Analysis of the development of stock level indicators over that period (28 years) confirms the observations made during trawling evaluation campaigns in that it indicates a sharp fall in catches of all species per unit of effort. Some species, however, are particularly strongly affected. They belong to both *Scianidae* and *Sparidae* and are specially targeted for export.

The relative stock level indicator for *badèche* (*Mycteroperca rubra*) was less than 10 kg/h in 1998 as against 50 kg/h in the 1970s.

The catch per unit of effort of all species of African threadfin (*Pseudolithus spp*) was less than 10 kg/h in 1998; at the end of the 1970s it was over 2 tonnes.

The stock level indicator of red seam bream which exceed 300 kg per hour in 1975, had fallen to 50 kg per hour in 1998. The stock level indicator of pageot (*Pagellus bellottii bellotti*), which was over 1 000 kg per hour in the early 1980s, declined sharply in the second half of that decade. However, that this trade name is used to designate several species of *Sparidae*; in fact, the designation covers both Coastal demersals found on the continental shelf, such as *pagre* (*Pagrus caeruleostictus*), and those found on the edge of the continental shelf and on the slopes, commonly known as deep dentex (*Dentex macropthalmus*, *D. canariensis*). The real decline in the stock level of one species is disguised by an increase in that of another. Gradual domination by deep dentex along the edge of the continental shelf and on the slopes has, however, been observed in the past few years.

The stock level indicator of *pageot* (*Pagellus bellottii bellottii*), which was over 1 000 kg per hour in the early 1980s, declined sharply in the second half of that decade. Since 1990 it has fluctuated between 200 and 400 kg/h, showing a slight upward trend, which may be due to the fact that this trade category also includes species found on the edge of the continental shelf or on the continental slopes.

The stock level indicator of *machoirons* (*Arius spp*) has followed the same pattern as that of *pageot*, falling sharply in the second half of the 1980s (from over 4 000 kg per hour in 1981 to approximately 100 kg per

hour in the early 1990s). Since 1996, the stock level indicator of *machoiron* has risen significantly.

The stock of *Thiékem* (*Galeoides decadactylus*) has declined since the early 1980 (as indicates the fall in the stock level indicator from over 1000 kg per hour in 1981 to around 130 kg per hour in 1995).

The catch per unit of effort of black seam bream (*Plectorhinchus mediterraneus*), which had been over 140 kg per hour in 1977, fell to less than 20 kg per hour in 1998.

The stock level of coastal white shrimp (*Penaeus notialis*) fell to 60 kg per hour from over 800 kg per hour in the early 1970s.

The same is true of *thiof* (*Epinephelus aeneus*), whose stock level indicator was less than 10 kg per hour in 1998 as against 140 kg per hour in the early 1970s.

The relative stock levels of a few species have, however, shown an upward trend, which may be evidence that certain replacement phenomena are taking place. The species concerned are cuttlefish, rock sole, octopus and, to a lesser extent, *brotule*, *sompatt* and red mullet.

The study of fishing statistics suggests that the available campaign-based information was gathered at a time when stock levels for the resource as a whole were already low. The decline in stock levels for a number of species determined on the basis of the evaluation campaigns is far smaller than that recorded over a longer period of nearly 30 years.

### C. Explanation of the development trajectories observed

The explanation of the overall decline in stock level indicators for coastal demersals lies both in the increased fishing effort and competition with regard to these species and in the development of harmful practices in response to that decline. Furthermore, the observed decline in catch per unit effort took place during a period of rapid technological upgrading of fishing capacity which, all else equal, should have improved fishing efficiency and led to greater catch per unit of effort.

In the medium term, illegal incursions by demersal trawlers in certain areas very near the coast are causing erosion of biodiversity and deterioration of habitats in the areas concerned. For example, they explain the fact that off the central delta of the Saloum, large grey mullet (*Mugil*

*cephalus*) measuring 70 cm are nowadays caught only by chance. The aquatic plant habitats this species prefers have been destroyed, scraped away by trawler nets from vessels in search of sole and cuttlefish in an area reserved for small-scale fisheries.

The coastal fraction of stocks exploited further offshore by industrial fishing vessels is fished by small-scale fishing units. This fraction has an essential function in supplying offshore fisheries with full-grown individuals. Coastal areas are breeding grounds for almost all demersal species. Juveniles and young individuals of marketable species are confined to these areas from birth to capture age. Uncontrolled exploitation of these vulnerable resources by small-scale fishermen using destructive non-selective fishing methods causes considerable harm to the renewal of adult stocks tapped by industrial fisheries and consequently to stocks of reproducers needed to supply the coastal breeding grounds with juveniles. The decline in relative stock levels is therefore not due to industrial fishing activities alone. Senegal's small-scale fisheries, access to which is currently free, are exploiting the coastal strip in an intensive and often irresponsible manner. Cases of failure to apply certain regulations, in particular those relating to mesh size, to small-scale operators have been observed. Growing resource scarcity is responsible for competition-induced conflicts between the two types of fishing, ranging from occasionally dramatic incursions by industrial fishing units into areas reserved for small-scale fisheries to the export industries trying to supply their enterprises with the small-scale sub-sector's captures.

The overall fishing effort level is well above that which would be sustainable. The need to make their sea trips profitable by increasing the size of catches is forcing fishermen to react by adopting compensatory adjustment measures, such as fishing in increasingly distant waters or entering into association with industrial trawlers. Catches of noble species by small-scale fishing boats are then purchased and preserved for export on board the trawler, which serves as a refuelling and safety base for the pirogues. Such mutual interest associations contribute towards the further depletion of coastal fishing areas by increasing the small-scale fishing effort. They also lower the quality of fish reaching the domestic market.

So far as industrial fisheries are concerned, the adoption of compensatory adjustment measures by way of reaction is most evident in the case of shrimp trawlers. Because of the smaller mesh size used (40 mm instead of 70 mm for fish) and because the kind of shrimp in demand on the market is scarce, most shrimpers now catch only fish, with an infinitesimal proportion of shrimp in landings following a sea trip. The use of shrimp

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nets to catch fish entails the rejection of very large quantities after sorting, which contributes to resource depletion and reduces the stock levels of the species fished. In 1998 the Fisheries Board decided, with the support of the Research Department, to monitor the specific composition of the shrimpers' nominal landings. Several vessels previously in possession of a shrimp fishing licence were "downgraded" to fishing boat status because of the small proportion of shrimp landed following several sea trips.

The latest measure taken by the authorities in charge of fisheries has been to impose a freeze on the industrial fishing effort. While this step may have political significance, it is of little value from the biological point of view. A reduction of fishing effort, rather than a freeze, would have been more appropriate. Moreover, the measure applies only to industrial fishing, ignoring the considerable pressure exerted on the resources of the coastal zone by small-scale fishing. The table below, which shows the comparative development of small-scale and industrial fleets from 1980 to 1998, is highly instructive in that regard.

YEAR	INDUSTRIAL FISHING			SMALL-SCALE FISHING	
	National Fleet	Foreign Fleet	Total	Number of pirogues	Number of fishermen
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

### 5. Specific environmental and socio-economic impacts of different categories of subsidies to Senegalese fisheries

#### A. Support to modernisation

1. The policy of **tax reductions on boat engines and fishing equipment** reflected the authorities' recognition of the central role played by small-scale fishing in the sector's development. Motorisation

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has unquestionably been the decisive factor in modernising the small-scale sub-sector. Larger pirogues, longer sea trips, the opening up of new fishing areas and the introduction of the purse seine are its direct consequences. On the other hand, it is not certain that motorisation was a direct result of the Government's tax reduction policies. It was certainly encouraged by them, but measured against the sector's turnover of CFAF 200 billion, the CFAF 2 billion in annual tax reductions does not amount to a great deal. If this assistance were withdrawn, most of the operators would probably take to self-financing their activities. Only the least profitable enterprises might, at worst, be forced out of the sector. But these are, for the most part, pelagic fishing units, which—considering the production margins for pelagics—do not involve the same environmental problems as demersals. Moreover, the vessels concerned are oriented towards meeting domestic demand and are thus performing an important function as regards the country's food security. Whether there is any justification for maintaining these subsidies in respect of mostly prosperous export-oriented fishing units whose activities do not benefit the Senegalese consumer is an open question.

2. Even where government intervention is confined to subsidising production, it still strengthens fishing capacity by reason of its technological impact. In this category, the **fuel subsidy** is having the most immediate impact on technological development by encouraging boat owners to acquire more powerful and more fuel-consuming engines. Boats equipped with such engines enable the fishermen to go farther out to sea, to stay at sea longer and to increase their catches. There can be no doubt that the fuel subsidy has had a significant impact in terms of extending the length of sea trips of icebox pirogues and has helped to intensify the demersal fishing effort. Whether it should be maintained in the present context of improved profitability of export-oriented fishing is open to question. A solution that distinguishes between pelagic and demersal fishing should probably be sought.

3. As regards the **policy of funding activities**, notwithstanding the attractive conditions offered (20 per cent self-financing requirement instead of the usual 33 per cent required by project promoters; subsidised loans, preferential interest rates, etc.), the size of the CNCAS portfolio is too small for such funding to have had a significant social or environmental impact. In any case, the situation of small-scale fishing enterprises varies too greatly, both economically and in terms of their contribution to the national interest, for it to be possible to pass a final judgment. These policies benefit fishing units that would be making a profit even without them, although they (demersal fishing units) contribute only little to food

security, and, moreover, they provide no guarantee of continuing existence to pelagic fishing enterprises. As regards industrial fishing, the *Fonds de Promotion Economique* (Economic Promotion Fund) cannot finance large-scale projects, which explains the underdevelopment of tuna fishing. The chief beneficiary of the FPE is trawler fishing, already sufficiently developed considering the present level of exploitation of stocks of crustaceans, demersals and cephalopods.

4. The **construction of fishing wharves**, for its part, should have a positive environmental and hygienic impact. In the first place, owing largely to lack of landing infrastructures, the proportion of rejects in small-scale fishing is very large (some 20 per cent of output) and fishing wharves could help to increase landings. Secondly, the fact that landings are performed under highly unsatisfactory hygienic conditions is an argument in favour of the construction of wharves from the public health point of view.

5. Despite the relatively small quantities involved, the **central fish market** has played a positive role in improving the quality of marketed products and has helped to regulate the fish supply in the Dakar area. Leaving aside the question of its specific importance, the role of the Central Fish Market should be viewed in a national perspective. Local distribution of fishery products is extremely limited. Marketing constraints are such that great inequalities continue to exist between Dakar and the rest of Senegal, between coastal areas and the interior, and between urban centres and the countryside.

Tax reductions on engines and fishing equipment are probably having a greater impact than funding policies, but they suffer from the failure to differentiate between different categories of enterprises operating in the sector. At the same time, the inadequacy of existing infrastructures does not allow small-scale fishing to benefit fully, on the domestic market, from the strong demand generated by a growing population. The need to create conditions for the satisfactory operation of domestic markets is evident. In terms of policies this implies strengthening the material infrastructures of markets in the interior, especially communications and storage facilities. Wholesalers and retailers are confronted with an acute shortage of adequate vehicles and storage facilities. A large proportion of landings are lost altogether and what remains has to be sold very quickly. This reduces the wholesalers' bargaining power and ultimately discourages investment in this activity. Planning and construction of storage facilities by the public authorities for the benefit of the private sector would help to mitigate extreme price fluctuations.

## B. Assistance to internal and external marketing

1. Projects to **establish fish trading centres and a refrigeration chain** have come to nought, mainly because they proved unable to cope with a substantial portion of the landings, but also because they were based on a conflictual view of the relationship between fishermen and small-scale wholesalers. In reality, wholesalers were prompt to grasp the value of “upstream” investing in the purchase of boats and fishing equipment in order to ensure an abundant and regular supply. In its dealings with an industry where spontaneous dynamics have always prevailed over attempts at State administration, the State should confine itself to providing adequate marketing infrastructures and should leave the development of marketing to the private sector. That being said, the fact remains that, in terms of support to marketing which has consistently focused on export promotion, local marketing of sea products is still receiving poor-relation treatment.

2. **Free zone and duty-free export company status** bestows considerable advantages on export-oriented processing units. The *Zone Franche Industrielle (ZFI)* (Industrial Free Zone) of Dakar, established in 1974, offers a wide range of attractive tax, social and customs incentives to companies located inside it. The Free Zone Status Act of April 1991 extended these advantages to export industries based outside the ZFI. In 1995 the Act was extended to cover agricultural enterprises (including fishing industries) 80 per cent of whose output is exported. These incentives have attracted sea product packaging/processing companies eager to take advantage of the growing demand for sea products worldwide and especially in the developed countries. The presence of large numbers of such companies is exerting strong pressure on the demand for exportable products and ultimately creates a threat to stocks of demersals, crustaceans and cephalopods.

3. The **export subsidy** was not originally intended for the fisheries sector. It was instituted in 1980 to boost exports of agricultural products, severely affected by the deterioration of international terms of trade. Initially set at 10 per cent of FOB value, it was raised to 15 per cent in 1983 and extended to tuna at the same time. After a second revision in August 1986 extending it to all sea products, the subsidy peaked at 25 per cent. It was abolished in 1994 following the 50 per cent devaluation of the CFA franc.

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In an adverse economic context, this subsidy has undoubtedly had a more negative environmental impact than in other countries where measures of this kind were used. Its introduction coincided with the implementation of structural adjustment programmes that led to the devaluation of the CFA franc. All these programmes were aimed at raising the level of exports, including sea products, and had the effect of steadily increasing the pressure on stocks of the principal export species.

4. **Devaluation** is the cornerstone of the macro-economic reforms advocated by donors, aiming to eliminate the abnormalities affecting the CFA franc exchange rate. Its environmental impact is undeniable. The improved profitability of export companies was reflected in an intensification of the fishing effort, which had a harmful effect on stock equilibrium even if increases in the cost of imported inputs did something to restrain that process. Here a distinction must be drawn between export companies and those working for the domestic market. Whereas, in the case of the former, the growth of external demand more than compensated for rising input costs, the operating accounts of most of the latter deteriorated after devaluation, giving rise to fears that domestic demand might have to face serious problems of supply.

Outside the capture component, devaluation also had a major impact on the processing sector. The prospects of better profits attracted many newcomers to the sector, but stocks of exportable goods are not elastic. This situation was reflected in a sharp rise in commodity prices and to difficulties of supply to the processing plants. All other things being equal, the extra demand on the part of export units probably resulted in an intensification of the fishing effort at a time when demersal captures were already clearly on the wane.

5. Inasmuch as European demand is principally focused on noble species of high market value, the trade advantages granted under the **Lomé Convention** (which represent a form of subsidy) probably helped to increase the fishing pressure on endangered stocks of demersals, crustaceans and cephalopods.

6. **Fishing agreements** have also encouraged the growth of export volumes. Notwithstanding financial compensations, experts believe this to be one of the main causes of the overexploitation of maritime resources in African countries. By lowering the production costs of fishing units, fishing agreements encourage them to fish beyond the economic optimum compatible with sustainable resource management. Moreover, since the fisheries concerned are industrial, mono-specific and governed

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by quotas, vessels do not hesitate to reject catches that are not of the required species or size in order to maximise the value of their output. Furthermore, in the absence of proper means and equipment, fishing by foreign fleets in Senegal's Exclusive Economic Zone takes place without any control worth speaking of on the part of the Senegalese authorities.

As regards problems arising from fishing agreements and possible solutions to these problems, a distinction must be drawn between deep-sea pelagic resources and coastal demersals. In the case of tuna fishing covered by the agreements, efforts to deal with any stock depletion problems should be made at the international level. Stocks of Atlantic tuna are the common property of all countries bordering that ocean, and Senegal's capture capacity is so small as to be practically non-existent. On the other hand, the national fleet, both industrial and small-scale, has plenty of access to demersal resources, already overexploited, so that it is legitimate to wonder whether the policy of quotas in respect of those resources deserves to be continued. Furthermore, counterpart payments are not large enough to justify the continuance of the policy on the grounds of development goals. Funds disbursed by the European Union under the most recent agreements have reached their highest level at CFAF 32 billion over a four-year period, or CFAF 8 billion a year. This figure has to be set against the total value of exports, which amounts to CFAF 180 billion.

7. Measures in support of **aligning certain export units with international standards** do not necessarily have an adverse environmental impact even when they involve stocks of demersals, crustaceans and cephalopods. The point at issue here is the extent of the advantages enjoyed by all export enterprises without distinction. Having already benefited from free zone and duty-free export company status as well as from the export subsidy, these companies also derive advantages from favourable provisions of the Lomé Convention, from the landing requirements included in the fishing agreements, and from devaluation. This situation has encouraged too many newcomers lacking adequate financial standing or sound technological capacity to enter the sector, especially since devaluation. The resulting shift of export structures towards fresh and frozen products has left but little room for advanced processing (cans, medallions, fish steaks, peeled shrimps, etc.) This state of affairs is unsatisfactory both from the environmental point of view, because exports of unprocessed products mean that volumes are rated higher than margins, and from the angle of economics because the exported products' value added is generally low. This means that measures aimed at favouring companies with the highest value added rates, to the detriment of the speculative motivations that have helped to pull down the processing sec-

tor, are not necessarily negative. In a context of increasingly scarce resources and rising commodity prices, it would surely be advisable in future to adopt selective measures that will reduce the number of companies operating in this sector and encourage more elaborate processing. Such measures would be beneficial from both the environmental and the economic points of view.

The overall environmental and socio-economic impact of measures in support of exports has been negative. They have caused an appreciable shift of fishing effort towards coastal demersal species, which in turn has led to stock depletion. So far as marketed species in this category are concerned, the latest abundance indicators (UNEP 2001) point clearly to a drastic reduction in medium sizes and suggest a risk of biological collapse. A further effect of this shift has been to reduce the quantities reaching the domestic market, thus causing appreciable price increases. Given the importance of fish to the country's food security, the social consequences of these measures are therefore highly negative.

Lastly, from the point of view of economics, while these measures have undoubtedly helped to boost not only the volume but also the gross value of exports, they have probably been too general to guarantee sustainable export growth.

### C. Support to small-scale processing

Given the strategic importance of small-scale processing in terms of the regulation of fish supply to the domestic market (small-scale processing absorbs a third of all landings, makes use of products rejected by wholesalers, extends the conservation period, facilitates access to cheap animal proteins, etc.), support to this activity has so far been extremely limited. Technology dissemination programmes designed to increase output and to improve hygiene in this area are a step in the right direction, but in a context of difficulties in supplying the domestic market, more systematic support measures aimed improving handling, packaging and storage would undoubtedly prove worth while. Such measures would help to cut post-capture losses, improve the population's access to animal proteins and reduce potential threats to human health, thus offering obvious social and environmental advantages.

## 6. Conclusion

Immediately after Independence, the authorities placed the emphasis on direct support to production as such, i.e. to the capture component, initially for the benefit of the industrial sub-sector and, later, for that of small-scale fisheries. The primary objective of these direct support measures was to supply the domestic market with animal proteins. Between the 1970s and the 1980s the emphasis shifted gradually to support to marketing, international rather than domestic. In the meantime the decline of traditional exports (phosphates and groundnuts) had brought fisheries to the forefront of Senegal's foreign trade policies. Since then, the promotion of exports of sea products has been a permanent goal of support policies. Little by little, however, this strategy has become incompatible with the country's national goal of food security. It has been more successful than direct intervention in influencing the practices of small-scale fishermen, but the end result has been to orient their effort towards exports rather than the domestic market. Today, factories derive 60 per cent of their supply from small-scale fishing units. Some industrial units will pre-finance the equipment of a small-scale fishing unit against the promise of being able to purchase its output at a preset price. Thus the effort of small-scale fishing units in respect of demersal resources has been intensified, adding further to the pressure already exerted on those resources by Senegalese and foreign trawler fleets. Most marketed species in this category are now in danger of biological collapse. At the same time, the rapidly growing number of companies operating in the packaging/processing component means that the future of many of them is by no means certain. Additional demand coupled with growing resources scarcity has caused commodity prices to soar, thus endangering long-range foreign trade prospects. The situation seems ripe for the simultaneous pursuit of environmental, social and economic objectives. That is what subsidies should endeavour to achieve in the future.

While development policy has played its role fully with regard to the dissemination of technological advances—evidence of this is the success of motorisation and of the introduction of the purse seine—there are indications that, at least in its current form, this policy has reached its limits. Some types of activity have seen their profits decline sharply in the last few years. Purse seine fishing, which was extremely profitable until 1982, now faces difficulties due apparently to an overfishing phenomenon in the *Petite Côte* area. Like fishing with encircling nets, it has suffered since devaluation from rising input costs, while the price of its output (intended for the domestic market) has not significantly increased.

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The overall impact of the policy of generalised assistance in the form of tax reductions on inputs or of fuel subsidies, if continued, will probably be negative. In the first place, this policy has boosted the fishing effort, possibly beyond the economic optimum; secondly, it represents a burden on the State budget in a situation of economic crisis. The Government's annual indirect financial contribution to small-scale fishing is estimated at CFAF 8 billion. Certain illicit practices (a black market in subsidised fuel) are necessitating increased controls over the distribution of tax-reduced inputs. There can be no doubt that, in order to determine who should benefit from such subsidies, some discrimination should gradually be introduced between export-oriented fishing units and those whose output is sold on the home market.

Taking into account the relatively long depreciation period, the construction of landing and marketing infrastructures has been less costly (a little over CFAF 10 billion over approximately ten years for the fishing wharves and the Central Fish Market). This support measure offers advantages both from the environmental point of view, in that it helps to reduce post-capture losses, and socially by improving marketing conditions and thus benefiting the public.

Support to domestic marketing, practically non-existent at present, would likewise facilitate the population's access to fish and fish products. On the other hand, indiscriminate encouragement of exports through measures such as the export subsidy, free zone or duty-free export company status, the Lomé Convention and devaluation has created as many environmental, social and—potentially—economic problems as it has solved in terms of foreign trade. By granting considerable facilities to exporters, it has encouraged speculators and dealers “on the make”, thus undoubtedly playing a role in the relatively low level of advanced processing (15 per cent) and attracting too many operators to the sector. While indirect transfers to the sector resulting from the Lomé Convention or devaluation are difficult to quantify, the fact remains that these transfers have been largely responsible for doubling the value of exports between the 1980s and the 1990s (from CFAF 90 billion to 180 billion). Duty-free company status and the export subsidy, when it still existed, accounted for direct or indirect transfers to the sector of approximately CFAF 3 billion. In future, support to exports should be limited to the most efficient companies with the highest industrial value added rates. The CFAF 2.7 billion subsidy for alignment to international standards would seem to meet those conditions.

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As regards small-scale processing, on the other hand, it is to be regretted that, notwithstanding the important social functions this activity fulfils (high degree of labour intensity, recovery of unsold products, relatively low access costs, etc.), it is receiving very limited support.

Lastly, the policy of support to small-scale fisheries depends wholly on foreign assistance, with the financial dependence that this implies, for investment financing. The practice of tied aid the preferences of foreign donors often give rise to technological choices that are open to question.

To sum up, the amounts involved in direct or indirect transfers do not in themselves represent the major problem.

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**Annex**

**Table 1**

**Development of annual fuel consumption by small-scale fishing,  
commercial value and amount of subsidy**

<i>Year</i>	<i>Consumption (litres)</i>	<i>Commercial value (CFAF 1000)</i>	<i>Subsidy (CFAF 1000)</i>
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