



Integrated Assessment of Trade Liberalization and Trade-Related Policies

A Country Study on the Fisheries Sector in Argentina



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NOTE

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EXECUTIVE SUMMARY

The application of structural adjustment policies in Argentina in the 1990s had a series of strong impacts on the economic structure of the country. The positive impacts caused by structural changes (such as price stabilization and a fixed foreign exchange rate), created conditions that encouraged growth in the fisheries sector. The growth of the fisheries sector was accompanied by the opening up of trade for Argentine fisheries products in foreign markets, and the diminishing resources in oceans under developed countries' jurisdiction. These revisions meant that there was an increase in fisheries production and exports, an improvement and growth of the fisheries fleet, and technological innovation in the sector. Furthermore, there was a transfer of the overcapacity fleets from some countries to Argentina, instrumented with the benefit of subsidies.

The exploitation of fisheries resources was minor in Argentina until the opening up of the economy. The growth of fisheries exploitation then took place at unprecedented rates, and this has been one of Argentina's most dynamic economic sectors in recent times. It has been categorized as the world's fastest growing fishery. Value added has grown steadily and exports grew 478 per cent between 1985 and 1995. Exports have even surpassed, for some years, international trade in traditional agricultural products. A strong international dimension is present in the current patterns, not only by the growth in international trade and a heavy reliance on foreign markets by the sector on harvesting (since only about 10 per cent of the products are consumed domestically), but also due to the transnationalization of capital in the fisheries sector.

However, the increasing and unregulated fisheries trade has had critical negative impacts on resources and on the socio-economic structure of the fisheries sector. Some of the verifiable impacts are: degradation of the fisheries biomass and near collapse for some species; variations in fishing effort; ecological degradation; increased costs for fisheries regulation and control; increased operation costs; augmenting fiscal costs and subsidies; corruption practices; and non diversification of catches. Many of these specific impacts are directly related to investment oversizing, as the overcapitalization of fleets. Other impacts have been increasing unemployment and underemployment, as well as the worsening of labour conditions. Social conflict is another relevant negative impact that arises in periods of fisheries' resource scarcity. The quantifiable economic costs (evaluated by cost-benefit analysis), have indicated that the policy situation of the 1990s (that is, uncontrolled fishing activity as well as a lack of adequate economic instruments), has implied a net direct cost of about US\$ 500 million, just for the most exploited species. The same sort of CBA was carried out for a hypothetical situation defined as respecting maximum sustainable yield (MSY). If this parameter had been utilized, this policy could have had a net benefit of about US\$ 5,100 million.

A whole series of economic instruments for sustainable management can be implemented in order to benefit from trade in the fisheries sector, and at the same time maintain natural capital, develop the industry and generate employment. These can be changes in the

sector's productive and economic structures (changes from commodity mode to use of resources with value added), re-dimensioning the fishing fleets, as well as the implementation of a tradable quota system. Other management measures can range from technological adaptations of the fishing gear, the overhauling of command and control mechanisms, to an effective application of a sustainable development policy orientated to the Argentine fisheries sector.

ABBREVIATIONS AND ACRONYMS

CBA	cost-benefit analysis
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CEDEA	<i>Centro de Estudios Ambientales</i>
CFP	Federal Fisheries Council
CPUE	capture per unit of effort
CTMFM	<i>Comisión Técnica Mixta del Frente Marítimo Argentino-Uruguayo</i> (Technical Mixed Commission of the Argentine-Uruguayan Maritime Front)
EEZ	Economic Exclusive Zone
EU	European Union
FAJ	Fisheries Agency of Japan
FFC	Federal Fisheries Council
FOB	free on board
FONAPE	National Fisheries Fund
GDP	gross domestic product
GOA	Government of Argentina
GPV	gross production value
H & G	headed and gutted
INIDEP	<i>Instituto Nacional de Investigación y Desarrollo Pesquero</i> (National Institute for Research and Development of Fisheries)
ITQ	individual tradable quotas
JICA	Japan International Cooperation Agency
MERCOSUR	Southern Common Market
MSY	maximum sustainable yield
NAFTA	North American Free Trade Association
NPV	net present value
OECD	Organization for Economic Cooperation and Development
PROMEX	<i>Programa de Promoción de Exportaciones de Productos de Base Agrícola No Tradicionales</i> (Programme for the Promotion of Exports from Non-Traditional Agricultural Base)
QMS	quota management system

SAGPyA	<i>Secretaría de Agricultura, Ganadería, Pesca y Alimentación</i> (Secretariat of Agriculture, Animal Husbandry, Fisheries and Food)
SENASA	<i>Servicio Nacional de Sanidad y Calidad Agroalimentaria</i> (National Agroalimantation Quality and Safety Service)
SMC	WTO Agreement on Subsidies and Countervailing Measures
TAC	Total allowable catch
VA	value added
ZCP	<i>Zona Común de Pesca Argentino-Uruguaya</i> (Argentine-Uruguayan Common Fisheries Zone)

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United Nations Environment Programme

The United Nations Environment Programme (UNEP) is the overall coordinating environmental organization of the United Nations system. Its mission is to provide leadership and encourage partnerships in caring for the environment by inspiring, informing and enabling nations and people to improve their quality of life without compromising that of future generations. In accordance with its mandate, UNEP works to observe, monitor and assess the state of the global environment, and improve our scientific understanding of how environmental change occurs, and in turn, how such changes can be managed by action-oriented national policies and international agreements. UNEP's capacity building work thus centers on helping countries strengthen environmental management in diverse areas including freshwater and land resource management, the conservation and sustainable use of biodiversity, marine and coastal ecosystem management, and cleaner industrial production and eco-efficiency, among many others.

UNEP, which is headquartered in Nairobi, marked its first 25 years of service in 1997. During this time, in partnership with a global array of collaborating organizations, UNEP has achieved major advances in the development of international environmental policy and law, environmental monitoring and assessment, and our understanding of the science of global change. This work has, and continues to support, successful development and implementation of the world's major environmental conventions. In parallel, UNEP administers several multilateral environmental agreements including the Vienna Convention's Montreal Protocol on Substances that Deplete the Ozone Layer, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (SBC), the Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention, PIC) and most recently, the Cartagena Protocol on Biosafety to the Convention on Biological Diversity as well as the Stockholm Convention on Persistent Organic Pollutants (POPs).

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The mission of the Division of Technology, Industry and Economics (DTIE) is to encourage decision-makers in government, industry, and business to develop and adopt policies, strategies and practices that are cleaner and safer, use natural resources more efficiently and reduce pollution risks to both human beings and the environment. The approach of DTIE is to raise awareness by fostering international consensus on policies, codes of practice, and economic instruments through capacity-building and information exchange and by means of pilot projects.

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Foreword

The process of opening markets for trade liberalization in many developing countries has led to export-oriented goals and policies. Although developing countries are at times able to hold a competitive advantage in pursuing an export-oriented agenda within certain sectors, unregulated trade and trade distorting policies from abroad and ensuing environmental degradation can result in more harm than good. Negative socio-economic impacts from resource degradation can prevent countries from experiencing gains from trade. The fisheries sector in Argentina is a good example of the links between trade distortions and negative environmental effects and its resulting socio-economic impacts.

Although a country without a high domestic consumer preference for fish, Argentina expanded its fisheries sector to export to newly opened markets in developed countries facing diminishing fisheries resources. Argentina continued liberalizing their markets through various domestic macroeconomic policies which encouraged further expansion of the Argentine fisheries sector solely for exports to foreign markets. Additionally, Argentina received subsidized fishing fleets from developed countries and leased temporary fishing licenses to countries with diminished fish stocks. These practices combined led to unsustainable over fishing and depleted fish stocks in the Argentine waters.

This study strongly links over fishing and the related depletion of fish stocks to subsidies from developed countries for fishing overseas. The study also illustrates a clear link between trade distortions from unregulated trade and negative environmental impacts, such as degraded fisheries biomass and rapid decline of those fish species preferred by export markets. These practices have also resulted in socio-economic impacts within the fisheries sector, such as increased operation costs and the displacement of traditional fishing communities that supplied the local market.

This report points to the importance of regulating trade and avoiding trade distorting practices within the fisheries sector. With this study, UNEP hopes to demonstrate that by negotiating fishing agreements based on maximum sustainable yield capacities sustainable trading within the fisheries sector can be maintained.

1. INTRODUCTION

Argentina's economic structure has experienced some of its most radical changes in the country's history in recent years. The major economic reforms of the 1990s affected just about every sector of economic and political life in the country. As part of a far-reaching Structural Adjustment Programme (SAP), the Federal Government assumed plural reforms. They have included a stabilization programme of a fixed foreign exchange rate and a tight monetary policy, state reform (mainly the privatization of public utilities and enterprises), deregulation of markets and economic activities, and openness of trade regimes. These transformations have been part of a package that has thoroughly changed commercial exchanges, with areas directly related to trade liberalization (such as increasing foreign direct investment and opening up new markets).

The impacts of structural adjustment and liberalization of the economy have been mixed. While there have been several positive impacts, negative impacts can also be identified. Increased domestic consumption, production, productivity and exports can be recognized, together with some technological and organizational innovations. At the same time, weaknesses of the Argentine capital and financial markets indicate that the economic system is increasingly dependent on the supply of foreign funds. Additionally, other negative trends have also been identified: higher rates of concentration and transnationalization of the economy, leading to 'declustering processes' in many industrial chains, high rates of unemployment and underemployment, as well as deterioration of labour conditions, increasing fiscal deficit and foreign indebtedness, worsening income distribution and higher pressures on natural resources.

The fisheries sector in Argentina can be perceived as a case where most, if not all of these variables and dynamics come into play. First of all, the exploitation of fisheries resources had been extremely minor in Argentina until the opening up of the economy. However, the growth of fisheries exploitation has since then taken place at unprecedented rates, and this has been one of Argentina's most dynamic economic sectors in recent times. Argentine fisheries have been categorized as the world's fastest growing fisheries¹. Value added has grown steadily and exports grew 478 per cent between 1985 and 1995. Exports have even, for some years, surpassed international trade in traditional agricultural products. A strong international dimension is present in current patterns, not only by the growth in international trade and a heavy reliance on foreign markets, by the sector on harvesting (since only about 10 per cent of products are consumed domestically), but also due to the transnationalization of capital in the fisheries sector.

As in other areas of the economy, the impact of trade liberalization on the fisheries sector has been mixed. Although the sector experienced impressive growth in the early part of the 1990s, with all the usual positive indicators such as growing employment in commu-

¹ See Global Environmental Outlook 2000, United Nations Environment Programme, 1999.

nities dedicated to export-oriented fishing, fleet improvement and growth, technological innovations, and income generation, negative trends have also been identified, such as decreasing employment in traditional fishing communities, increased costs in operation and regulation/control, and investment oversizing. Furthermore, after intensive over-fishing, a strong degradation of fisheries biomass has been documented, putting the main species harvested near biological collapse and causing increased fishing effort. This and other negative environmental impacts have been closely inter-linked to social and economic crises in the sector.

This report addresses several issues, such as the social, economic and environmental impacts of trade liberalization in the fisheries sector in Argentina in the 1990s. The study has analysed these issues in the integrated manner that such complex systems merit. It deals with the different policy and legal components involved, as well as confronts, whenever possible, these matters with a quantification of costs and benefits. Furthermore, the report attempts to draw guidelines for a proactive policy package that could be implemented in order to address the problems and strengthen the positive aspects of trade liberalization in the Argentine fisheries sector.

This report is divided into several sections. After the Background to the Project, Section 4 details the impact that macroeconomic reform has on different areas of the Argentine economy, and in particular on the liberalization of the fisheries sector. Here, the main policy instruments and investment reforms applied have been enumerated and there is an effort to take an inventory of these policies' positive and negative impacts. The report goes on to describe how the fisheries sector functioned before and after liberalization, and depicts the sector's natural resources, and technical and geographical aspects.

The work continues with a description of the domestic fisheries market in Argentina, as well as a description of export patterns and international market aspects (Section 5). An analysis of the relationship and impact that subsidies have had on the growth of the sector and the subsequent crisis is also developed. Furthermore, an analysis of the labour market in different sub-sectors of the fisheries industry is formulated. The document then presents an account of the national and international legal frameworks for the sector as well as a description of the administrative layout relevant at the national and sub-national level (Sections 6 and 7).

In the next section, (Section 8) the industrial structure of the fisheries sector is analysed, paying particular attention to the differences between the harvesting sub-sector (distinguishing factors that come into play in fleet composition) and the on-shore processing sub-sector. A typology of agents in the fishery system is profiled, contemplating businesses and also labour organizations, private institutions, and civil society actors. Related to this, the contradictory concerns of the different interest groups are outlined.

The next section (Section 9) of the report is an exercise in evaluating the impact that trade liberalization has had on the social, economic and environmental aspects of the fisheries sector. Furthermore, the work describes the impact of policies on fish stock reduction in an individual manner for the most threatened species of fish, as well as an account of the impact on the marine ecosystem. The evaluation goes on to portray a social analysis of macroeconomic impact, differentiating several aspects of the crisis experienced in the sector after liberalization. Matters such as employment, social conflict and unrest (among others) are explored. This section also contains an economic valuation of this issue, accomplished through a cost-benefit analysis (CBA) of the policies. This methodology is also em-

ployed to examine the distribution of benefits and costs. Furthermore, several hypotheses and scenarios are also tested through different cost-benefit assessments.

The last section of the report (Section 10) is a forward looking and proactive chapter. Here there is an attempt to delineate a policy approach that aims at curtailing the negative impact that trade liberalization has had on the fisheries sector, yet at the same time harnessing the possible benefits that this type of economic policy can have. The process approaches endorsed have been divided into two types, with the understanding that in this case they are intrinsically interlinked. The types of policies recommended are (a) command and control measures and (b) economic and market-based instruments. The report is completed with a general conclusion and in-depth recommendations for policy revisions.

2. BACKGROUND TO THE PROJECT

2.1 Relevance of the sector to the national economy

The fisheries sector has been relevant to the Argentine economy in recent years for several reasons. Firstly, it was one of the most dynamic sectors of the economy in the 1990s, the period of the greatest economic transformations accompanying, and integral to, aspects of trade liberalization processes.

In the peak years of production (1995 - 1997), exports accounted for about US\$ 1,000 million. For those years, the export revenue from fish products surpassed revenue from exported beef, a historically traditional export product of Argentina.² Although the crisis situation of the fisheries sector is already being felt in economic terms, in 1998 seafood exports arrived at US\$ 860 million. This magnitude has been roughly maintained in 1999 and in 2000.

Analysis of the creation of new markets for exported seafood products is also pertinent when the significance of the sector is contemplated. The importance of trade relations with Asian markets is an example, where several Asian countries are included among the ten largest importers of Argentine fisheries products (Japan, South Korea, Taiwan and China). Exports to Japan, for example, grew from US\$ 24 million in 1990 to US\$ 93 million in 1993. For the same period, exports to South Korea grew from US\$ 920 thousand to US\$ 21.5 million.

Besides defining relevance in terms of strict economic quantification of revenue generated by the fisheries sector, other factors come into play - such as employment created by the sector. Twenty-five thousand jobs are directly dependent on the fisheries' harvesting and processing sectors. Some estimates indicate that indirect employment in the fisheries sector could be as high as 100,000. Besides, several communities depend on fisheries as their most important economic drive.

According to and FAO survey, Argentine landings encompass about 1 per cent of the world's marine captures, and due to the high degree of exports that make up these figures, this makes Argentina one of the foremost seafood exporters in the world.³ In the 1990s, the fisheries sector provided, on average, 3.3 per cent of total export revenue.

² For example, beef exports for 1997 reached US\$ 803 million.

³ See Schonberger and Agar, 1999.

2.2 Project objectives and outputs

The project objectives and outputs have been multiple. First and foremost, the project aimed at developing a methodology and carrying out an integrated environmental, social and economic assessment of trade liberalization policies impacts on the fisheries sector in Argentina.

An adjacent objective involved the fostering of dialogue between private and public stakeholders. Furthermore, the project's ultimate objective was to develop and recommend policies (involving economic as well as command and control instruments) that could help to take full advantage of trade liberalization in the sector

The concrete project outputs can be divided into two types: publications and presentations. The main publication to date is this report. Additionally, a related work, "*Subsidies in Argentine Fisheries*", was prepared for UNEP's Fisheries Workshop held in Geneva in February 2001. The case has also been used in courses in European and Latin American universities, discussed in expert groups on the environment/trade area, as well presented in a series of diverse national and international forums. These include, among others, the high-level and ministerial meetings on Environment, Sustainable Development and Trade organized by UNEP in March 2001, the Committee of Trade and Environment of the World Trade Organization in February 2001, and the Latin American Regional Seminar of the WTO on Trade and Environment in November 2000.

2.3 Project approach and process

The project has been approached not only from a traditional research perspective but also from the incorporation of results from several participatory multi-stakeholders' dialogues and in-depth interviews. In these events, a great number of public and private organizations participated actively. The meetings included representatives from the Argentine national administration (the Ministry of Foreign Affairs, International Trade and Religion; the Ministry of Economy; the Ministry of Social Development and Environment; the Secretariat of Agriculture, Animal Husbandry, and Food; and the Secretariat of Environmental Policy), from both houses of parliament (the Senate and the Chamber of Deputies), as well as representatives from provincial governments, local authorities and the armed forces. Private organizations such as business chambers of different areas of the fisheries industries, and associations of companies also took part. Labour unions, professional associations, academics, and non-governmental organizations were dynamic participants in the meetings. Finally, representatives from international institutions (such as UNEP and the European Union) also took part in the meetings.

A national steering committee, with representatives from different areas of government and from the academic sector, was created for the project. The Steering Committee met with the project team and participated actively in the guidance of the project.

The present work has also gone through an extensive peer review process. Drafts of the report were submitted for comments and suggestions to steering committee members, key people in the fisheries sector, as well as international experts.

3. DEVELOPMENT OF IN-COUNTRY METHODOLOGY

3.1 Overview of methodology selection

The present project took into account multiple methodologies. In the context of the project, the aim of the report is to analyse in a comprehensive manner the social, economic and environmental impacts that trade liberalization of the Argentine fisheries sector has had in the 1990s. Particular attention is paid to integrating the analysis of these three aspects and observe the inter-relationship between them.

Due to the multiple nature of the issue, various methodologies have been selected for the development of the study itself. These have ranged from literature reviews, to setting-up and analysing participatory debates, as well as interviews and cost-benefit analyses, *inter alia*.

A forewarning on the issue of methodology needs to be made in relation to data availability and reliability. A major problem with respect to methodology deals with the availability of data—different sources supply diverging data and at times contrasting information. For this reason, multiple sources have been consulted whenever possible to ponder information.

This study has also a temporal limit. The project analyses the impact that trade liberalization policies have had on the fisheries sector in the 1990s. For historical purposes, and due to a lack of cohesive data gathering from different primary sources, sometimes references are made to events and data from the 1980s or other periods. Yet it can be said that the boundaries of the analysis run from 1990 to 1999. Although many changes have occurred from late 1999 to date, the study itself does not aim at carrying out a day-by-day follow-up.

3.2 Methodology and data gathering methods

The methodology of the study followed a deductive method to analyse the hypothesis that trade liberalization did have an impact on the environmental and socio-economic variables of the Argentine fisheries sector. As such, after a conceptual definition of the problem, there was a search for a specification of indicators, to conclude in operational definitions of the variables involved. These were employed throughout the different stages of data gathering and information sources.

The multiple approaches utilized respond to an integrated assessment of the aggregated issues to be analysed when dealing the fisheries sector - the nature of the problem calls for various methodological approaches to be used. The methods used include a review of the relevant literature and primary research, analysis of economic trends in the fisheries

sector, and an examination of the norms and laws relevant (directly and indirectly) to the regulation of the fisheries sector. Furthermore, a series of workshops and participatory meetings have been an integral part of the analysis to search for different stakeholders' opinions and views on the subject. Specifically, the study used the following data gathering methods:

- a) review of relevant literature dealing with macroeconomic changes in Argentina, with a special emphasis on the examination of the impact that these transformations have had on the fisheries sector;
- b) review of relevant literature dealing with social and employment issues related to fisheries exploitation in Argentina in the 1990s;
- c) review of relevant literature dealing with biological, ecological and natural resource impact that the exploitation of fisheries has had in the country in the 1990s;
- d) analysis of the trend and structure of fisheries exploitation in Argentina against a background of trade policy and macroeconomic reforms;
- e) examination of national and international norms that have a bearing on the fisheries sector;
- f) analysis of fisheries administration organization, at the national and sub-national levels;
- g) cost-benefit analysis to assess the social, natural resource and economic impact of export-oriented exploitation of the *Merluccius hubbsi* species, testing several hypothesis ranging from factual policy to sustainable management practices.

The final specific objective of the project was operationalized as follows:

- h) To outline a policy package that could harness the positive impacts of the opening up of trade in the fisheries sector while mitigating the negative impacts.

Consequently, the study is based on multiple information from national sources as well as from international institutions. Secondary data and primary information have been used in the analysis. In addition to traditional sources, a series of information has been elicited from various origins, such as multi-stakeholders' debates and in-depth interviews with qualified actors from private and public organizations.

4. INTEGRATED ASSESSMENT OF TRADE LIBERALIZATION

Impact of trade liberalization and investment policies on sustainable development issues.

4.1 Impact of economic reforms and liberalization of trade in Argentina

Since the 1930s until the late 1970s, the Argentine economy followed a pattern of a closed economy (import substitution model), strong policy regulations and state participation. A first round of liberalization policies (commercial and financial openness, privatization processes) was implemented in the 1980s. Strong macroeconomic instability, high inflationary processes, as well as fiscal and debt crises characterized the late 1980s, and was the scenario driving the economic reforms of the 1990s.

The new set of policies combined stabilization programmes with structural reforms and liberalization of trade. Its main components were:

- 1) Stabilization programme: fixed foreign exchange rate, tight monetary policy;
- 2) Commercial openness (trade liberalization);
- 3) State reform: privatization of public utilities;
- 4) Deregulation of markets and economic activities.

The Convertibility Plan, launched in April 1991, was a central feature of the stabilization programme. The nominal foreign exchange rate was fixed at one peso to one dollar, and law sanctioned this parity. The second central element was the monetary policy: the new legal framework greatly narrowed the Central Bank's autonomy and ability to supply credit to the Government, in other words, to create money. In the new context, the Central Bank should maintain reserves in gold and foreign currency to the equivalent of 80 per cent of its monetary base.

There was a strong interaction between all these policies.⁴ The opening up of trade was implemented together with the deregulation of the financial system, state reform, and a stabilization programme. The capital account of the balance of payments was completely deregulated in 1990: restrictive policies regarding capital movements were abolished, financial flows and foreign direct investments were liberalized. The elimination of quantitative restrictions on imports and a strong reduction in tariffs, as well as the elimination of taxes on exports were at the core of this programme. Changes in tariffs were introduced as a function of the evolution of the real exchange rate and the deficit in the trade account.

⁴ See Fanelli, et al, 1997.

However, regional integration with the Southern Common Market (MERCOSUR) affected the structure of intra-regional tariffs.

One important consequence of the simultaneous deregulation of capital movements and trade, in a context of a fluid supply of foreign funds and currency appreciation, was the marked increase in the trade account deficit, fostered by increasing imports.

State reform (privatization of public utilities), deregulation of markets and economic activities dramatically changed the economic rules inherited from the import substitution period. All promotion regimes and policies were derogated (industrial, regional, and export promotion programmes) by decree together with the “*Compre Nacional*” (buy national) public procurements policy. This norm included the deregulation of professional fees and the deregulation of markets, including labour markets.

On the other hand, state reform implied the privatization of a great number of public firms, which included, among others, public utilities (telephone, electric power, and urban water works), commercial air transport, railroads, port infrastructure, steel complexes, and several petrochemical enterprises.

The main goals of these reforms were to reduce the fiscal deficit and to stop inflationary processes. The privatization process did not change the monopolistic position of firms. It meant a change in the ownership of firms without the establishment of strong regulatory frameworks.

Main impacts identified

Although there are some methodological problems in evaluating the impacts of the economic reforms discussed above (mainly because of the necessary transitional period between the implementation of the reform and the expected changes), it is possible to state some evidence. There was a first expansionary phase until 1994, after the launching of the economic reforms. It was characterized by control of the inflationary process and high activity levels. In the programme's first years, domestic demand grew by 60 per cent and productivity by 40 per cent. However, it must be taken into account that in 1990, the activity level was very low. In addition, there was a process of catching up in private consumption, after the previous recession years. The main factor behind this impressive increase in demand was the expansion of credit facilitated by the great inflow of external capital.

After the impacts of several international financial crises (in 1995, 1997, and 1998), and the increase of the United States' interest rate, capital inflow slowed down. The economic model based on trade liberalization, deregulation, and privatization showed its vulnerability, and a period of stagnation and contraction of the economy followed the first successful years. In 1995, gross domestic product (GDP), consumption and fixed gross investments declined. On the other hand, exports showed a sharp increase. But in analysing foreign trade performance during the period, the positive impact of the MERCOSUR regional trade union, on the commercial trends must be taken into account.

Between 1991 and 1994, annual GDP rates were about 8 per cent. In the next five years, the growth rate diminished, arriving at a contraction and stagnation situation at the end of the 1990s.

Summing up, the positive impacts over the decade can be identified as:

- increased domestic consumption, production, productivity, investments and exports;
- access to new technologies on process and products, logistics and communication;
- organizational innovations;
- modernized infrastructures and services.

These goals were achieved in a context of strengthening competitive pressures, industrial restructuring, the presence of new modern (foreign) agents and firms that encouraged competitors to follow new strategies, and the achievement of severe cost reductions. A more attractive economic environment, and facilities to repatriate benefits enhanced foreign direct investments, in many cases through acquisitions and mergers, but in others through joint ventures and greenfield investments.

However, important weaknesses in the Argentine capital markets, and an important degree of financial fragility in the banking system still remains as a result of the above-described process. A very low domestic savings rate reflects an economic system that remains increasingly dependent on the supply of foreign funds.

In addition, other negative trends can be pointed out:

- higher rates of concentration and transnationalization of the economy, with crowding out of many small and medium sized firms;
- ‘declustering’ processes in many industrial chains, as a consequence of the substitution of national productions by imports;
- high rates of unemployment and under-employment, and the deterioration of labour conditions;
- worsening income distribution;
- higher pressures on natural resources, without appropriate institutional, legal and organizational rules and control systems;
- increasing fiscal deficit and foreign indebtedness.

The following sections will discuss how Argentine fisheries were affected by these economic reforms. The impacts on natural resources, and the social and economic impacts will be analysed in an integrated manner.

4.2 Impact of economic and investment reforms on the fisheries sector

Trade and investment legislation ensured a protective environment for national fishermen and national firms from the 1960s to the 1990s. The main features of this policy scenario were:

- a) only national flag fleets could fish and disembark in national ports;
- b) only new vessels could be imported, and were subject to high tariffs (in order to protect the national shipbuilding industry);

- c) fishing vessels could only hire national crews (100 per cent of officers and 75 per cent of sailors).

These highly protective policies would have contributed to the relative underdevelopment of the fishing fleet, and the low growth rate of the fisheries sector. In fact, the fisheries sector was oriented to the relatively small domestic market, since no significant external demand was present, and high trade barriers in the European and Asian markets were in effect. Consequently, the operations of the national fleet (mostly artisanal) were restricted to *Mar del Plata* and areas nearby, and no significant activities of foreign vessels were reported in the international waters close to the Argentine coast during almost three decades prior to 1990.

Actually, world demand was then too low to justify the operation of international vessels in the South Atlantic area. In addition, cultural consumption patterns, the low prices and availability of beef can further explain Argentine's very low per capita consumption of fish products.

The 1980s started with the acceptance of the Economic Exclusive Zone (EEZ), that granted economic rights to Argentina over an enormous area of the South Atlantic. The Malvinas War caused a political division and control that divided this area into two zones with different fishing approaches and regulations.

In any case, pressure on these resources was relatively low until the end of the decade. During these years, only vessels from the former Soviet Union and Bulgaria operated within the EEZ under bilateral agreements with Argentina. Very few ships were fishing within the Malvinas zone. The rate of catches and exploitation of all species was well below the total allowable catch (TAC) estimated by the National Institute for Research and Development of Fisheries (INIDEP) and set by national authorities.

At the beginning of the 1990s, a growing demand from external markets (mainly the European Union and some Asian countries) put additional pressure on South Atlantic fisheries. In the Malvinas area, local authorities started a rather liberal policy of granting fishing licenses to vessels from these origins.

In Argentina, foreign companies (mainly Spanish) established their enterprises as local Argentine firms in order to comply with existing regulations (i.e. only ships flying the national flag could fish within the Argentine EEZ). This process started before any significant change in the 'protective-biased' national legislation.

These new Argentine firms could operate new ships only if they were able to get a fishing license previously owned by another vessel. Given the fact that the granting of fishing licenses during the previous three decades was a rather flexible process, the real quantity and availability of these instruments is still a mystery. Due to the non-transparent and ad hoc manner in which these licenses were granted and/or traded, thorough knowledge as to the real number of licensing (and therefore the installed fishing capacity), is missing. However, there is evidence that a very active market for fishing licenses has developed since 1987. The typical transaction involved purchasing a fishing license granted for an officially retired medium sized ship, for the operation of a larger ship with more modern technology, that was imported and nationalized by the new Argentine firm.

Consequently, the size and power of the Argentine fishing fleet grew significantly from 1986 to 1991, that is to say, previous to any change in the existing legislation. In other words, the process of expansion of the fisheries sector started before the economic reform

process, including trade liberalization, investment reforms and other deregulation measures. Nevertheless, the economic reforms that started in 1991 had several effects on the development of the sector, namely the economic environment became more favourable to foreign investors.

Main impacts on the fisheries sector

High inflation, high risk of devaluation, regulated foreign capital movements, public intervention in foreign exchange markets, erratic rates of interest, and irregular credit availability, among others, were all elements that characterized the Argentine economy for more than three decades before the profound economic reform package of 1991. In addition, a highly regulated economy and high protection tariffs and other barriers to free trade discouraged foreign investment.

As mentioned above, the main economic reforms were: (i) the Convertibility Plan (*Plan de Convertibilidad*) through which a fixed foreign exchange rate was adopted and linked to a very tight monetary policy, (ii) privatization of the main public utilities, (iii) deregulation of numerous economic activities and markets and, (iv) a progressive liberalization of foreign trade.

The main impacts of the economic reforms initiated in 1991 affected all economic activities, including the fisheries sector, as follows:

a. Price stabilization and fixed foreign exchange rate:

The '*Plan de Convertibilidad*' provided solid guarantees on the stability of the foreign exchange rate (one peso = one US dollar) and shortly after its inception, inflation significantly slowed. This new scenario changed investors' expectations and investment projects with long maturity periods started their implementation. Fisheries projects found a favourable environment in which to develop. National firms began investment programmes but with financial constraints and uncertain foreign markets. Foreign investors with access to their own national markets and financial facilities found a very attractive scenario to expand their activities.

b. Credit availability:

As has been seen, the economic reforms rebuilt the financial markets and bank deposits, enlarging the national credit availability. Although credit was rather scarce until 1994, foreign firms and the largest national firms obtained credit for working capital at the lowest interest rates in the market. The expansion of fisheries activities was financed greatly with local credit. The Banco Nación (the main state-owned commercial bank) was the principal source of credit for fishing companies, while other public sources also contributed to the sector (mainly provincial financial facilities).

c. Free movement of foreign capital:

Foreign investors were sufficiently assured that the whole economic reform package included unlimited and free movement of foreign capital. This fact had significant impacts on the fisheries sector where foreign investors owned most of the new national firms.

Consequently, the settlement rate of foreign capital in the fisheries sector saw a significant growth.

d. Reduction of import tariffs and export taxes:

A general reduction on the level of effective economic protection was reached shortly after the 1991 package. This result was obtained through the reduction of import tariffs and export taxes of numerous goods as well as by the elimination of several quotas and non-tariff trade barriers. Several working inputs for the operation of fishing vessels as well as equipment were affected by these measures that reduced the cost of fleet operation.

e. Deregulation of numerous economic activities and markets:

In 1992, a general deregulation of economic activities was introduced by decree. The decree included the deregulation of professional fees, limits to several regulations on specific labour markets (including crews of ships), and introduced general guidelines for a progressive deregulation of activities at national and provincial levels. The fisheries sector, as well as many other economic activities, benefited from this new environment.

f. Privatization of public utilities:

The privatization of ports (or the creation of mixed-enterprises with participation from provincial government and private firms) and their operation had a significant and positive impact on the fisheries sector.⁵ The privatization of other public utilities had both positive and negative impacts on the sector, i.e. while better services were provided and lower port operation costs took effect, higher prices of energy, fuel and communications services increased the operating costs of fishing activities.

In brief, the economic and investment reform policies of the early 1990s had positive impacts for the growth of the fisheries sector. The characteristics of the sector's growth (namely, close links with foreign-owned firms) provided the ground for taking advantage of all the economic measures that ensured a low risk of devaluation, free access to foreign capital, the reduction of import tariffs and export taxes, and a progressive deregulation of economic activities.

In addition, a set of specific measures for the fisheries sector was adopted between 1991 and 1992. They had several direct impacts on the ongoing growth process of the fisheries industry in Argentina.

4.3 Policy instruments for the fisheries sector

The high degree of economic protection that characterized the fisheries sector until the mid 1980s was clearly affected by the package of economic and investment reforms presented above. The fisheries sector did not change the general and basic legislation that regulated its activities, the most important feature of this legislation being that 'Argentine

⁵ For example, cost reductions in port operation services, measured as transport costs for fisheries products, decreased 78 per cent (previous to privatization the cost was US\$ 120/ton, in 1989, which was reduced to US\$ 29/ton in 1994).

waters were reserved to Argentine fishermen'. In other words, the flag of fishing vessels should (almost always) be Argentine.

Therefore, the expansion of the fleet was mainly through the incorporation of new Argentine-flag ships, although many of them belonged to foreign owners that had settled their firms in the country. To facilitate this process, several norms were modified in the early 1990s, mainly the possibility of importing 'second-hand' vessels (Decree 1493/1992), the modification of the proportion of national personnel in the crews (Decree 817/1992) and several other previous regulations. In addition, given the presence of *jiggers* chartered in the area (with or without fishing licenses granted by the Malvinas authorities) a special regime of 'chartering' was granted to foreign flag vessels, mostly from Asian countries that specialized in squid fishing.

In 1994, a powerful new policy instrument was introduced: the Agreement with the European Union (EU).⁶ This Agreement had important differences from the typical agreements signed between the EU and several developing (mainly African) countries until that year. In fact, it did not ask for a general authorization for EU-flag vessels to fish in Argentine waters. It was an agreement based on incentives (i.e. subsidies) from the EU for establishing joint-ventures with local firms so that vessels from EU member countries could establish themselves within the Argentine EEZ. It therefore enhanced the establishment of EU capital under national law.

This set of instruments constituted the main legal framework for fisheries' regulation in Argentina between 1994 and 1999. While in legal terms, the instruments seemed much more adequate than the other regimes of non-European countries, the enormous deficiencies in law enforcement and other command and control measures, and serious suspicions of bribery and corruption, led to a severe crisis in the fisheries sector at the end of the decade.

⁶ The treaty was actually signed with the European Economic Community (EEC). Given the new denomination that took place after the Maastricht Treaty (i.e. the European Union) and shortly after the fisheries accord with Argentina, the denomination EU is used throughout this study.

Corruption issues have mired the Argentine fisheries sector in recent periods. As illegal activities, these cannot be measured easily. Yet there are very strong gauges to indicate that these sorts of practices have taken place to a large degree in this context. It has been found that a large percentage of vessel licenses for operation in Argentine waters are irregular (and these are still under revision). In many instances, boats were allowed to operate in one sort of modality but end up operating in manners not permitted by the type of license granted. Non-reporting of catch is another relevant non-legitimate way of operating. Concerning the issue of corruption in direct relation to the EU accord, some evidence also exists. For example, many of the permits to fish, which had to replace licenses for other non-operating ships in order to maintain capacity, did not meet with these and other criteria. (Godelman, et al., 1999).

Concerning these types of questions, related investigations into the issue of corruption and subsidies in the fisheries sector have taken place in Europe. The European Court of Auditors have carried out a scrutiny, in 1998, of subsidies programmes for setting up joint ventures to transfer fishing capacity toward non-European waters (and given that this type of agreement was only operating in Argentina, this audit mostly relates to the transferred capacity to Argentine waters). A whole series of anomalous situations, which have been categorized as 'bordering on the toleration of fraud', were found. The European Court found specifically, that in a number of instances, subsidies were granted and paid (a) in overpayments due to miscalculated ship's capacity, (b) for sunk ships, (c) to inactive vessels and therefore not reducing capacity, (d) for boats technically unsuitable for the activities subsidized, (e) to 'shell enterprises', i.e. non-existent companies, (f) to misrepresented submissions; and other to vessels and enterprises with other irregularities. Overall, the audit by the European Court concluded that the EU should revise its monitoring and control procedures and recuperate misused grants. (Court of Auditors, 1998)

4.3.1 Impacts on the fisheries sector

The fisheries sector has been one of the most dynamic economic sectors in Argentina over 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).

This process hides many other features of the evolution of this activity in the last decade. Actually, while global indicators (i.e. volume of catches, value of production, exports, etc.) grew steadily in the period, several microeconomic transformations were taking place, with significant impacts on the social and economic scenario in different regions of the country.

Last but not least, the impacts on the sustainability of measured biomass (in particular hake but also manifested in several other species), have been very negative. This phenomenon is pointing to the real limits of non-controlled processes of natural resources exploitation. Its degradation has social and economic costs much higher than all financial benefits obtained during the 'happy years' of non-regulated sectoral growth.

Positive effects

The main positive economic impacts in the 1990s fisheries sector can be listed as follows:

- a) increase in fisheries production leading to revenue generation;
- b) increase in exports leading to increased foreign exchange earnings;
- c) increase in employment in some areas (Patagonia and harvesting activities);
- d) improvement and growth of the fisheries fleet;
- e) technological innovation in the sector;
- f) increased research facilities and skills;
- g) opening of new markets and trade exchanges;
- h) increase in public income;
- i) regional infrastructure investments (ports, other infrastructure, new firms, etc.)

Negative effects

On the other hand, the main negative impacts include the following:

- a) degradation of fisheries biomass;
- b) negative ecosystem impact (removal of primary and secondary productivity);
- c) increased costs for fisheries' regulation and control;
- d) increased operation costs;
- e) increasing fishing effort; 4.3.1 Impacts on the fisheries sector
- f) run to fish;
- g) fiscal costs (subsidies);
- h) corruption practices;
- i) non diversification of catches;
- j) investment oversizing (over capitalization of fleets, ports, etc.)
- k) increasing unemployment in some areas (Buenos Aires and processing activities);
- l) deteriorating work conditions and increasing irregular hiring practices;
- m) social unrest.

Although the general literature on this subject, and assertions by stakeholders directly involved in fisheries exploitation tend to argue that positive impacts have outweighed negative ones, these positions have been severely criticized. This has been the case in the last two years when an abrupt crisis of the hake catch has caused more severe regulations and sectoral unemployment. In other sections of this report, an attempt to quantify the net costs and benefits of factual policies in the 1990s is presented. The section will also point out that the depletion of fish stock due to extreme over fishing not only resulted in a net benefit that is much lower today than what it could have been with adequate control and economic mechanisms, but also a net benefit that substantially decreases over time.

5. DIAGNOSIS OF THE FISHERIES SECTOR IN ARGENTINA

5.1 Description of fisheries resources

Argentina's extensive continental platform, as well as its coastal extension into the South Atlantic, are indicative of the country's high level of fisheries resources. The continental platform has an extension of nearly one million square kilometres and is one of the most extensive in the world. Sixty-five percent of the platform is covered by sand while the remaining firm surfaces are made up of rock or gravel.

Geopolitically, two fisheries areas can be identified: the *Zona Económica Exclusiva*, ZEE, (Economic Exclusive Zone) and the *Zona Común de Pesca Argentino-Uruguaya*, ZCP, (Argentine-Uruguayan Common Fisheries Zone). Due to the latter zone, fishing vessels with Argentine flags can fish until Parallel 34 (while the Platform's extension is made up of the area south of Parallel 36). (For a map of the Argentine Platform and the ZCP, see Annex 1)

These characteristics, as well as oceanographic properties (salinity, temperature, currents, etc.) result in over 400 species of fish⁷ identified as well as 90 crustacean and 200 mollusc species, as well as 150 macro-algae. Only some 20 per cent of the fish are currently considered of interest to fisheries exploitation.

Although biodiversity is not as extensive when compared with other ecosystems (particularly other systems in tropical areas), the high biomass present in several species counterbalances this relative deficiency.

The highly assorted and extensive platform, as well as living resources attests to a highly complex system. Knowledge about particular species as well as ecological dynamics varies greatly from species to species, and from sub-system to sub-system, from highly studied species and dynamics to other species or ecological dynamics which have not been analysed fully.

5.1.2 Main species in Argentine fisheries and their current status

According to the National Institute for Research and Development of Fisheries (INIDEP), the fisheries resources currently exploited can be classified according to the impact that the degree of exploitation has on the particular resource. The four characteriza-

⁷ Finfish are generally divided into *demersal* and *pelagic* species: demersal—species that inhabit areas close to the ocean floor, pelagic—species that inhabit surface waters.

tions, according to INIDEP, and following approximately similar international categorizations, are as follows:⁸

Over-fished resources

These resources experience a high degree of fishing pressures.⁹ These are resources which, generally, are fished well beyond maximum sustainable yield (when such a parameter is applicable to the particular species) or where other parameters for the reproduction of the stock are not taken into account. In order to avoid fisheries collapse, measures to recuperate the resource are advised. The fish species within this category are as follows:

- Merluza / Argentine hake (*Merluccius hubbsi*)
- Polaca / Southern blue whiting (*Micromesistius australis*)
- Corvina rubia / Croaker (*Micropogonias furnieri*)
- Pescadilla de red / Striped weakfish (*Cynoscion guatucupa*)
- Besugo / Red porgy (*Pagrus pagrus*)
- Merluza negra / Patagonian toothfish (*Dissostichus eleginoides*)
- Merluza austral / Southern hake (*Merluccius australis*).

A crustacean is classified at times in this category - Centolla de Tierra del Fuego / Tierra del Fuego Crab.

Resources fished up to maximum advisable levels

These resources are currently captured up to the maximum advisable levels. The recommended measure is to maintain present fishing at current amounts. The fish species within this category are:

- Abadejo / Ling, Kinglip or Pink suskeel (*Genypterus blacodes*)
- Gatuzo / Patagonian smoothhound (*Mustelus schmitti*)
- Merluza negra / Patagonian toothfish (*Dissostichus eleginoides*)
- Castaneta or Papamoscas / Castaneta or Hawkfish (*Cheilodactylus bergui*)
- Bacalao criollo or Bacalao austral / Patagonian cod or Red cod (*Salilota australis*)

The invertebrates in this category are:

- Vieira Patagonica / Patagonian scallop (*Zygochlamys patagonica*)
- Langostino / Argentine red shrimp (*Pleoticus muelleri*)
- Calamar / Argentine short-fin squid (*Illex argentinus*)

⁸ Given that the species included in these classifications do vary from year to year, the category groupings are listed as to their status in 1999, and therefore published in 2000. Nevertheless, even within the yearly diagnostics a series of internal discrepancies can be found in all but the overfished categorization. Therefore, for the following enumeration, species have been clustered according to those for which there is certainty as to their status. For those with an uncertain or debatable status there is an indication in the text.

⁹ For some species, fishing took place not only in a high degree but well beyond advisable levels for several years.

Other species are, at times, classified in this category, such as:

- Vieiera tehuelche / Tehuelche scallop
- Salmon de mar / Brazilian sand perch (*Pseudoperca semifasciata*)
- Mero / Argentine sea bass (*Acanthistius brasilianu*)
- Condrio / Argentine conger (*Conger orbignyanus*)
- Palometa pintada / Parona leatherjack (*Parona signata*)
- Pargo / Argentine croaker (*Umbrina canosai*)
- Lengüados / Flounder (*Paralichthys patagonicu*, *Xystreureys rasile*)

Resources with feasible increased exploitation in the short and medium term

These species are currently captured at numbers below the advisable catch level, and therefore increased extraction is feasible without endangering resources. The species in this category are:

- Merluza de cola / Hoki or Long tail hake or Patagonian grenadier (*Macruronus magellanicus*)
- Anchoita / Argentine anchovy (*Engraulis anchoita*)
- Caballa / Chub mackerel (*Scomber japonicus*)
- Sardina fueguina / Fuegian sprat (*Sprattus fuegensis*)
- Congrio de profundidad or Congrio chico / Hairy conger or Conger eel (*Bassanago albescens*)
- Cabarilla or Rubio de las piedras / Rocky fish or Sculpin (*Sebaste capensis or oculatus*).
- Nogotenia coluda or Lorcho fina or Chanchito / Southern longtail cod (*Pagonothen ramsayii*)
- Tuna family

Other species that at times are classified in this category are:

- Castaneta or Hawkfish (*Cheilodactylus bergi*)
- Savorin / Silver warehou (*Serirolela porosa*)
- Granaderos / Grenadier (*Coelorhynchus fasciatus*)
- Pez gallo / Elephant fish (*Callorhynchus callorhynchus*)

Special cases

These are species with particular biological dynamics that cannot be classified exclusively in any of the above categories or are special cases with respect to fisheries. For example, species that present a distinct status in different areas within the continental shelf, and can therefore be classified as species to maintain in one area and/or to increase exploitation in another. The species categorized accordingly are:

- Centolla / King crab (*Lithodes santolla*)
- Centollon / False southern king crab or Softshell red crab (*Paralomis granulosa*)
- Tiburones / Sharks (such as Gatuza) (*Mustelus schmitti* and *Mustelus canis*) and Cazon (*Galeorhynchus galeus*)
- Rayas / Rays or skates (*Rajidae* family)

Other species that may also fall in this category are:

- Pez ángel / Angel shark (*Squatina argentina*)
- Centollon de talud / Crab (*Chaceon notialis*)

For a listing of the main commercial characterizations of some of the principal species traded in Argentine fisheries see Appendix 2.

5.2 Geographical distribution of fisheries

The geographical distribution of fisheries is an intensely important variable in fisheries exploitation, given that the division is related to management regimes, administrative aspects of the fisheries sector as well as with the determination of areas where fishing can or cannot take place for a particular resource or period of time. Furthermore, the geographic distribution of resources is also relevant concerning the substantial shift that has taken place with liberalization and increasing exploitation (i.e. from traditional fishing areas off the Buenos Aires coast to the Patagonian sectors). Five ecologically defined areas have been identified:

Buenos Aires coastal complex

The region runs from 34° to 41° S. Within it, there are two distinct zones, distinguished by their hydrographic characteristics. The northern area encompasses the external region of the de la Plata River (*Rio de la Plata*) and its maritime front and therefore has estuary-type waters from this freshwater source. The southern area is known as *El Rincón*, where salinity levels are equal to or higher than the platform, due to drain-off from saline and salt-water lakes. The same species of fish are common to both sub-zones.

Internal and external platform complexes of Buenos Aires and Patagonian sectors

This expansive region runs between 34° and 48° S, and it has an estimated surface of 500,000 square kilometres. Several areas of egg laying and hatching are identified in this zone. An elevated number of species is characteristic in this complex.

Three Gulfs complex of northern Patagonia

This area comprises the three northern Patagonian gulfs of *San Matías*, *San José*, and *Nuevo*. The surface of this complex is of approximately 14,000 square kilometres. The number of species in this complex is less than that present in other ecosystems.

Southern Patagonian—Malvinense platform complex

This system runs along the external platform to the north, until parallel 42° S with a surface of about 285,000 square kilometres. Depth runs from 30 to 220 metres. Subantarctic waters make up this system, and the fish species present are mainly demersal.

Continental shelf's deep waters complex

This system comprises waters of a depth running between 220 and 2,300 metres. The fish species present are mostly those inhabiting cold deep waters.

The above distribution is based on ecological variables defining a fishing complex. Other zonal classifications following different criteria can also be found. For example, other categorizing, along strict geopolitical dimensions, is also found where fishing zones are divided in three sectors:

Argentina—Uruguayan Common Fisheries Zone

As defined by the Rio de la Plata Treaty between Argentina and Uruguay of 1973.

Buenos Aires coastal fishing zone

Traditional fishing zone, mainly of demersal coastal species.

Southern fishing zones

Covers the greatest area of the continental shelf, and a large number of different species are harvested in this section.¹⁰

5.3 Account of fisheries exploitation

5.3.1 History of fisheries exploitation

Argentina is not a country with an intensive fishing history. Although commercial fishing has taken place since the 17th century (for example whaling), and national norms and regulations on the matter can be tracked back to the late 19th century, the country did not until recently carry out concentrated exploitation nor intensive utilization of its vast ocean fishery resources. At the beginning of the 20th century the first fish processing plants began to function in Argentina, yet it is not until the 1960s that industrial-type fishing takes place with the integration of some high seas vessels. Furthermore, it is during this decade and immediately afterwards that other types of vessels and technologies are incorporated, albeit in small numbers (such as factory ships and freezing boats). It is in the 1970s that there is also a geographical shift, and commercial fishing begins to take place on a big scale

¹⁰ See, for example, *Argentina agropecuaria, agroindustrial y pesquera*, Secretaría de Agricultura, Ganadería, Pesca y Alimentación (SAGPyA), 1997.

in the Patagonian region of Argentina's south. (Until then, most fishing took place out of the Province of Buenos Aires—that is in the northern continental shelf area.)

Some sporadic peak periods of exploitation have taken place in the recent past, following either commercial or geopolitical goals. In the 1960s, accords with the former Soviet Union allowed for intense fishing of Argentine hake. Furthermore, in the 1980s, agreements with the former Soviet Union and Bulgaria were signed in order to implement a geopolitical strategy (in addition to a commercial approach) within the Malvinas influence area.

Yet the significant shift from under-utilization to over-exploitation of some fishing resources took place in the 1990s. In the early part of the decade, charter agreements with fleets from Asian countries were signed for the capture of squid. In the same period, Argentina agreed to the operation in its EEZ of fishing vessels and European firms in the form of nationally registered temporary companies or joint ventures. Arguably, one of the major changes experienced in relation to Argentine fisheries, however, was the agreement with the European Union, negotiated in the early 1990s and ratified in the middle of the decade. This accord, the first of the so-called 'second generation' agreements signed by the European trade block, involves joint ventures and temporary associations between Argentine companies and European capital. The agreement has meant that the European vessels are now established nationally as local ships and companies, with transnational capital. This change, as well as global transformations in the areas of fisheries, has radically changed the way that fishing activities are conducted in the country.

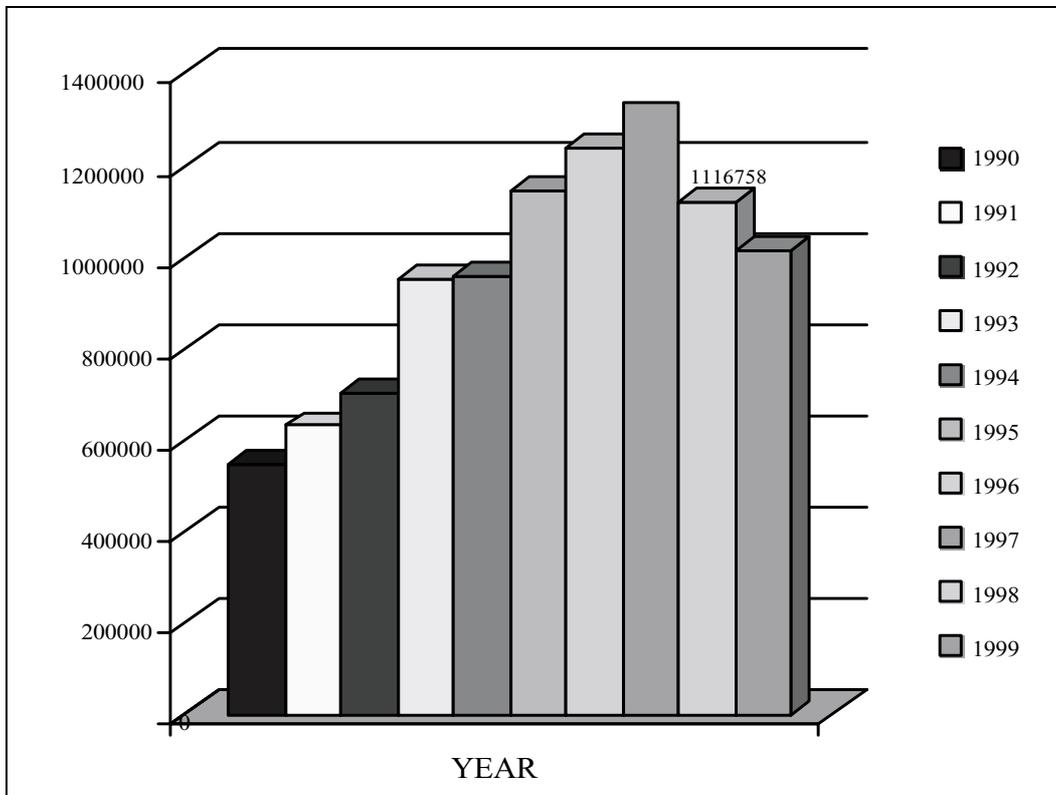
5.3.2 Fishing gear

As can be expected from multi-resource fisheries, a wide range of different types of fishing gear is utilized for capture. As stated above, a high proportion of the fishing fleet is categorized via the fishing gear used, according to the objective species.

Some of the most common fishing gear utilized is a variety of nets, such as hoop nets, purse seines, bottom trawls, mid-water trawls, longlines, and traps/pots. Yet it has been found that much of the fishing gear used is not selective as to the species captured, nor even in some cases the size of capture. The former case often results in large incidental fishing (by-catch) and discards, while the latter implies the capture of juveniles, therefore reducing the reproduction capacity of stock. Incidental and by-catch effects can also have impacts on non-fisheries resources, such as sea birds.

Non-selective or unregulated use of fishing gear has an immense impact on some commercialized species of the Argentine platform. A special case is the inter-relationship between hake and shrimp fisheries. Firstly, due to the much higher market value that shrimp represents, the hake by-catch is systematically discarded when collected by shrimp fishers, given that the gear utilized does not effectively discriminate the species caught. Although estimates are quite varied according to the consulted sources, they suggest discards of catch from 3.4 per cent (that is some 20,000 metric tons of hake) to some 62 per cent. There is evidence that juveniles make up much of these discards.

FIGURE 1
Total Capture by Year, 1990-1999



Source: Secretaría de Agricultura, Ganadería, Pesca y Alimentación (SAGPyA)

Several studies have suggested that the use of different types of fishing gear that discriminate species and size should be massively introduced in order to reduce by-catch and discards as well as lessen the impact on juvenile stock.¹¹

5.3.3 Recent exploitation of fisheries resources

The rapid and intense change in Argentine fisheries has meant that the country has changed from one with a sub-utilized potential to having resources over-exploited and reaching collapse in several cases in less than a decade (FAO, 1997). From the early 1990s to the peak year of 1997, total landings (including fish, molluscs, and crustaceans) grew from 544,320 metric tons in 1990 to 1,339,520 metric tons in 1997. This is an increment of 240 per cent.¹²

As can be seen in the graph above, there have been marked changes from the peak period of capture to date. The drop in landings between 1997 and 1998 was of 16.6 per cent,

¹¹ See Casal J. L. y Prenski L. B. (Editors), *Diagnóstico de los Recursos de la República Argentina*, INIDEP. Mar del Plata, Argentina, 2000.

¹² If increasing captures are differentiated between fish catch and molluscs/crustaceans, it can be seen that the latter experienced an even greater increase. From 1990 to 1999, the landings for molluscs and crustaceans increased 765 per cent.

while landings in 1999 dropped about 10 per cent when compared with the previous year. The reduction in total landings in 1999 when compared with 1997 has been around 25 per cent.

Individual species landings have also decreased sharply. For instance, Argentine hake landings have decreased by some 20 per cent while capture of Argentine short-fin squid (*Illex argentinus*) has also decreased—by almost one-third.

However, there is no argument from any source that any of the fishery resources of Argentina have been overexploited. Information varies from species to species and some are more studied than others. Nevertheless, the general conclusions are similar from all different sources. The data on capture for some varieties of fish is presented in the following, with analysis of those species for which information is most available and reliable.

Using for analysis captures of the *Merluccius hubbsi* species as an essential indicator, for 1997, 1998 and 1999, it can be seen that harvesting has greatly exceeded total allowable catch (TAC).¹³ For 1997 the maximum capture was set at 395,000 metric tons, yet official landing reportings arrived at over 584,000 metric tons. Just the reported landings alone therefore, are 47 per cent beyond the TAC. However this is a rather conservative figure. Estimates indicate that this amount falls short of reality, given that by-catch, discards, and unreported landings are not computed. When these types of catch are estimated, and high seas landings as well as the harvest in the Common Fishing Zone are added, it is found that total estimated catch for hake for that year arrived at 834,000 metric tons. This is more than double the TAC (111 per cent).

For 1998 the same pattern continues. Due to decreasing stocks, the TAC was lowered to 289,000 metric tons for that year. Yet reported landings greatly surpassed that amount again, with the accounted for capture reaching 395,000 metric tons. This is 36.6 per cent greater than the TAC. The pattern is quite similar with other species.¹⁴

In 1999, with a fully distended conflict already taking place, the total capture for this species was nearly 314,000 metric tons.¹⁵ The total allowable catch was 238,000 metric tons (declared capture was, therefore, 32 per cent above this figure).

Another finfish in risk conditions is the Southern blue whiting / Polaca (Micromesistius australis). This species experienced negligible captures until the late 1970s, yet accords and captures in the Malvinas region led to most of the swift increase in whiting catch. The accords for joint operation with fleet from the former Soviet Union and Bulgaria in the late 1980s to the early 1990s, accounts for most of the capture of this species.

In 1998 the total allowable catch was 79,000 metric tons, while reported capture was 100,000 metric tons according to INIDEP, and about 71,000 metric tons according to SAGPyA.¹⁶ If the data from the Secretariat is contemplated, it can be said that for 1998 reported catch was maintained within total allowable catch. Nevertheless, if the data from the

¹³ Total Allowable Catch (TAC) is a tonnage measure established yearly by the Government (based on scientific evidence) as to the maximum amount of extraction of a fishery resource that allows for regeneration (Maximum Sustainable Yield-MSY). Presumably it is a sum total of tonnage not to be exceeded.

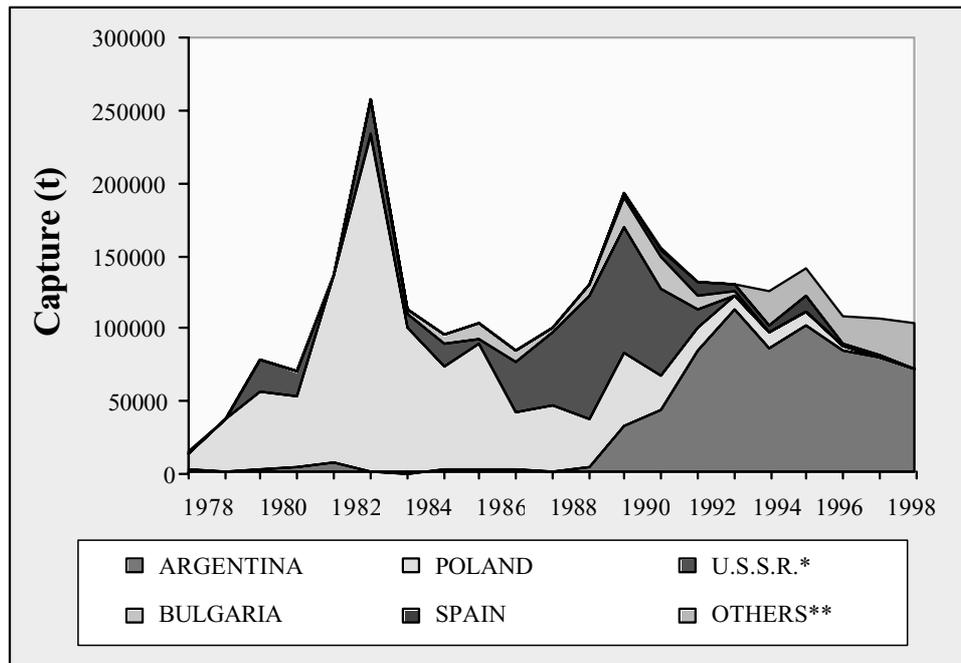
¹⁴ Country Assistance Strategy, the World Bank, 2000.

¹⁵ By Resolution 293/1999 of the Secretariat of Agriculture, Animal Husbandry, Fisheries and Food.

¹⁶ Unfortunately, enormous differences exist in reporting by different areas related to fisheries, such as the 30 per cent discrepancy here accounted for, making research difficult as well as coherent policy- setting.

INIDEP is taken into account, it can be calculated that reported catch was 26 per cent more than the permitted capture. Capture of Southern blue whiting reached a maximum reported capture of 190,000 metric tons in the early 1990s, yet as can be seen in the following graph, there have been several peaks in recent years.

FIGURE 2
Annual captures of Southern blue whiting in the south-west Atlantic



(*) USSR until 1990. It then included Russia, Ukraine, Lithuania, Latvia and Estonia.

(**) It includes captures in the area of the Malvinas Islands by vessels from Germany, Italy, Japan, Portugal, the United Kingdom and from ships from Malvinas.

Source: Casal, J. L. y Prenski, L. B. (Editors), *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP, Mar del Plata, Argentina, 2000.

5.3.4 Composition of landings

Analysis of the composition of landings, shows that although there has been some diversification over the years, most captures are just of a few species. This produces an inordinate amount of fishing pressure on just a few resources. In 1999, 77 per cent of captures was for only three species.

Although *Merluccius hubbsi* is diminishing its share of importance over time, it is still a substantial component of total landings and even more so of total fish landings. Argentine hake makes up 48.7 per cent of fish landings for 1999 (even in a year with an ample biological stop for this species).¹⁷ The proportion of *Merluccius hubbsi* of total landings was, for this year, 30.8 per cent.¹⁸

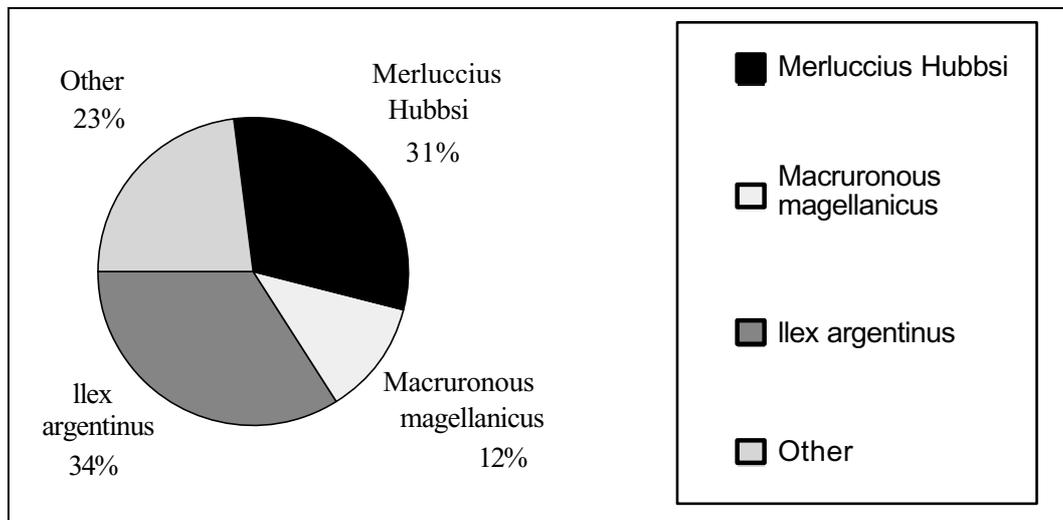
¹⁷ Hake landings in 1999 were in the amount of 311,992 metric tons, while total landings were 1,012,803 metric tons. Total fish landings (i.e. not including molluscs and crustaceans) were 640,017 metric tons.

¹⁸ Source SAGPyA, Capturas Totales por Mes por Especie 1997 and 1999.

Other species, which were not fished previously, have also experienced recent rapid and excessive growth in capture. Harvesting of *Macrurus magellanicus* (Hoki or Patagonian Grenadier) has grown 280 per cent from 1997 to 1999.¹⁹

A much more exaggerated situation is present with molluscs and crustaceans. In 1999, 90 per cent of captures in this category were made up of only one species, the Argentine short-fin squid (*Illex argentinus*).²⁰ This also represents around one-third of all captures (including fish) for that year.

FIGURE 3
Landings composition by species, 1999



Source: SAGPyA, 1999.

A note apart must be made for other captures that are not reported and hence, not adequately accounted for. Although data presented is official of all reported harvesting.²¹ Other estimates based on field research and calculation of indicators, attest that discards can range from 55 to 62 per cent.²² In total, different calculations estimate that capture can range between 110 per cent to 150 per cent over the TAC. In absolute numbers, the volume of estimated discards can reach nearly 300,000 metric tons. There is also information that in recent years, discards is in great measure composed of juveniles given their greater proportion in captures due to the status of hake, further stressing reproduction capacity of the species.

Furthermore, harvesting out of the EEZ as well as in the Malvinas area has a high impact on fish stock within the zone. The lack of full control over the extensive platform and national jurisdiction has strong implications for fisheries stock. The so-called '201' mile problem, with large scale fishing of species which are shared, migratory, or straddling stock is a problem of international dimension.

¹⁹ In 1997 only 41,835 metric tons of hoki were harvested, while in 1999 the total amount captured was 117,570 metric tons.

²⁰ The total capture of molluscs and crustaceans for 1999 was 372,785 metric tons, while the capture of Argentine short-fin squid was 342,693 metric tons.

²¹ For example, in Schonberger and Agar, 1999.

²² See Godelman, et. al., 1998 and INIDEP 1996, Informe Técnico n° 111/96.

5.4 National consumption patterns and the domestic market

5.4.1 National consumption patterns

National consumption of fish is not very high when compared with consumption in other countries. Cultural factors, as well as the high price of fish and fish products in the local market (when compared with other protein sources), has concluded in a historically small domestic market. Nevertheless, there has been a steadily increasing consumption of fish and fish products in recent years. The increase has been mostly in middle and upper-middle income groups as well as in large urban areas.

In 1960, domestic consumption of fish and fish products was 4.6 kilograms per capita. In 1996 this was 8 kilograms, while in 1999 consumption rose to 9.7 kilograms per capita. For 1996, consumption in Argentina's main urban area—Buenos Aires—(which includes one-third of the country's total population) was 9.5 kilograms per year.²³

5.4.2 Domestic market

National consumption only accounts for about 10 per cent of the total seafood catch. Here also, a very high concentration of consumption of a very few species is found. Hake, again, represents a very high proportion of the fish consumed, with about 60 per cent of the local market. The second largest fisheries product consumed is Argentine short-fin squid, with about 8 per cent of the local market. All other species represent individually a much smaller proportion of products consumed. Most local seafood consumed is either fillet or whole fish. Fresh (i.e. non-frozen and non-processed seafood) accounts for over 80 per cent of the value of domestic fish consumed (or 66 per cent of volume consumed). The market value of domestic fish consumed is of about US\$ 184 million. About 12 per cent of consumption is canned products and 8 per cent is frozen products.

The source of most locally consumed fish is based in the harbour of Mar del Plata, in the Province of Buenos Aires (traditional seaport and oldest major fishing town of the country). Eighty-five per cent of seafood consumed internally goes through the Mar del Plata harbour.²⁴ The fleets concerned with local consumption are the coastal and ice trawl group of vessels. Catch is generally sold to a cooperative that then carries out public sales to wholesalers. Although the proportion sold through this method is not fully known, it is estimated that it entails a large proportion of the Mar del Plata catch. The situation with frozen fish is slightly different, given that supply comes mainly (about two thirds) from Patagonian cities and harbours.

The wholesale market, particularly in the Buenos Aires Urban Area, is supplied directly and largely from Mar del Plata. There are a series of commercial as well as family enterprise links between wholesale distributors in Buenos Aires and Mar del Plata's businesses linked to the fishing industry. Some of these inter-linked companies also own vessels. Although there is no integral study as to the distribution patterns of fish products in

²³ Some data indicate that Mar del Plata's domination of the domestic market is decreasing over time. Aggregate consumption data includes consumption from domestic fisheries as well as imported products.

²⁴ note manquante

the domestic market, it is estimated that nearly two thirds of the domestic market is dominated by a small number of wholesalers (some 60 wholesalers in total).²⁵

The high concentration of the domestic market, the relatively small volume of trade, and the dominant role that the Mar del Plata fisheries system historically played, impaired the creation of classic chains of market, wholesalers, and retail sales. In spite of this, there were, in the 1980s, groupings created as a result of the mandated creation of a central wholesaler market in the Buenos Aires area.

Nevertheless, market deregulation policies in the 1990s also implied national deregulation, and the concentration market was disbanded in the early 1990s. This has created further changes in the way domestic markets function, with the result that smaller intermediary firms no longer exist, and the local market is even more consolidated, concentrating even further the domestic fish market arena.

Therefore, in recent years, wholesalers are solidly linked to retailers, closing even more than previously the commercialization of seafood in the local market. This not only includes the commercialization of local products but also the growing market of imported products.

Argentina has a long tradition of local canning and processing industries in the seafood sector. The first canning and processing plants were established in the 1920s. Here there is also a preponderance of companies established in the city of Mar del Plata with only newer plants established in the Patagonia region.

A recent change has seen the rise in consumption of imported seafood, partly due to the opening up of imports. Since the mid 1990s, the emerging pattern is that while seafood that comes from the local market is consumed fresh with little value added, imported fish products are generally processed foodstuffs or products of higher value than local fish. Accounts vary from year to year, but it is estimated that between 60 and 75 per cent of all seafood imports are processed fish products. The total value of imports has ranged to US\$ 60 to 70 million in recent years. The sources vary greatly from product to product. A great deal of imports of canned products is from Asian countries or other Latin American nations. Fresh seafood is mostly imported from other countries in Latin America.

The opening of markets for processed imported products (especially canned) has created a crisis in the processing sector. Many local canneries are currently closing or downsizing operations and unemployment is increasing in this fisheries sub-sector

5.5 Export patterns and subsidies

5.5.1 Growth of export patterns

The growth and change in export patterns is undoubtedly an outcome of the fisheries policies exercised in Argentina since the early 1990s. As discussed, local consumption is

²⁵ For a thorough compilation of information on the domestic fish market in Argentina, containing this summarized information, see Xavier Boursol and Santiago Caro "Infopesca: El Mercado del Pescado en Buenos Aires", July 1997, Montevideo, Uruguay.

very low compared to international standards and compared to volumes harvested; therefore the growth in fisheries exploitation has been almost solely brought to bear by the impelling force of exports. Over 90 per cent of the harvest is exported, making Argentina currently one of most important exporters of fish products in the world.

The growth of the export sector, taking for example the period 1986-1997, was at 368 per cent. This increase casts an annual cumulative growth percentage of 15 per cent in this period.

The increasing importance of fisheries exports can be exemplified by noting that for 1997, seafood revenue was about US\$ 1000 million, while in comparison, beef exports (a traditional sector of the Argentine economy) was slightly above US\$ 800 million. In 1998, with fisheries exports down due to the stock crisis, they still reached US\$ 860 million.

Primarily, frozen products are marketed abroad, accounting for over 90 per cent of traded volume (this proportion is about the same when measured by income or by mass internationally traded). Here again, a high proportion of hake and squid is seen. For the fish species, in the peak export year of 1997, over 33 per cent of the exports were made-up of this product, while the value of squid is also very similar to the value of exported hake.²⁶ These two products then make up nearly two thirds of all internationally traded seafood. Other products exported are fish paste (surimi) and shrimp, which have a higher market value yet lower volume in overall exports.²⁷

In general, it can be reliably stated that exports have very little added value, given that most products exported are just headed and gutted or frozen whole. Processed seafood products only account for a very small percentage of exports.

5.5.2 Foreign markets

Markets for internationally traded seafood products are somewhat diversified. In 1998, if export markets are distinguished by trade blocks, it can be seen that (by value of exports) the main receptor block was the European Union with 50 per cent of the market. Within the European Union, Spain is the main receptor country/point of entry to that market, mainly for hake but also including shrimp and squid (with 28 per cent of all products traded with the EU). The Netherlands is the second largest receptor country within the European block.

The Asian market receives 25 per cent of seafood exports (Japan is the main receptor here) and the Southern Common Market (MERCOSUR) is the third block in order of importance with 14 per cent of products. Within MERCOSUR, Brazil is the main receptor country. The North American Free Trade Association (NAFTA) block secures 10 per cent of exported products.

Exports of seafood to Brazil increased 271 per cent from 1991 to 1996. For the last year in this interval, the revenue from fisheries exports to this country was US\$ 126 million. This increase has clearly been a result of liberalization of trade within the MERCOSUR trade block.

²⁶ The revenue from exported hake and hake products in 1997 was US\$ 330,000,000, while the value of exported squid was US\$ 338,000,000.

²⁷ The value of these exports for 1997 were: for surimi US\$ 58,000,000 and for shrimp US\$ 51,000,000.

Most exports to Asia and two thirds of products to the European Union are done so without any type of processing. Nevertheless, a greater proportion of products exported to MERCOSUR as well as to the NAFTA block (83 and 63 per cent respectively) are processed before export.

When differentiating by the product exported, some clear specificity to each market and/or receiving region can be discriminated. Three countries are the receptors of two thirds of hake exports: Brazil, Spain, and The Netherlands. When distinguishing by revenue, for 1997 the main destiny of hake exports was Brazil (over US\$ 92 million). This export product was almost exclusively made up of frozen fillets. Next is Spain with over US\$ 67 million, two thirds of which are whole frozen products frozen on board ship. The third largest importer of Argentine hake is The Netherlands, with US\$ 58 million, half of which are frozen fillets and half of which are frozen whole fish.

Other products are directed to different markets. Short-fin squid is mostly traded with Asian markets, while the United States within the NAFTA block is the main receptor of shrimp. The relative weight of these exports varies slightly year to year, yet the main distribution characteristics are maintained.

5.5.3 Subsidies in Argentine Fisheries²⁸

Subsidies are an essential dimension to the situation facing global fisheries today. The Argentine case does not escape from this situation, from both an international and a national perspective. First, it must be stated that it is quite difficult to find the areas where subsidies to fisheries exist, given the few studies to date on this issue and due to subsidies masked as incentives or multifunctionality goals.

Subsidies and perverse incentives in relation to natural resources are increasingly being analysed due to their 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 subsidized, as well as an increasing recognition of the negative impacts that these subsidies have on sustainable development.

Although the definition and unravelling of the extent of subsidies (in particular those with negative impact on sustainable development) is still debatable, there is generalized agreement as to the processes involved that cause negative impact. It has been indicated that the main impact of fisheries subsidies can be divided into three outcomes (see Porter, 1998):

1. Drawing more enterprises and capital to the industry than would have occurred in a non-distorted and non-subsidized 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.

²⁸ This section is drawn largely from "Subsidies in Argentine Fisheries", a paper submitted at the UNEP Fisheries Workshop, Geneva, 12 February 2001.

As has been stated, the problems and the outcomes are also inter-linked. Ineffective management of fisheries is consistent with over-fishing as well as with overcapitalization/overcapacity. Overcapacity is intrinsically linked to subsidies. Yet falling profitability of the fishing industry and social problems (such as unemployment resulting from mismanaged fisheries) press for more subsidies (open or masked ones), creating a vicious circle and a more difficult issue to solve (Milazzo, 1997).

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 policy-makers and analysts. The issue is further compounded when subsidies are characterized or perceived according to outcomes or aims (for example, when they are masked under multifunctional goals). In the ensuing literature, some definitions are quite simple, such as indicating that subsidizing is the '*practice of providing governmental support to the fisheries sector*'.²⁹ 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.”*³⁰

There have also been attempts to operationalize concepts in order to unravel the intricate pattern of subsidies and perverse incentives impacting on natural resource use. The OECD has tried to do this through a typology that classifies subsidies according to some of their characteristics, as indicated below with some of the examples of each:

- budgetary subsidies;
- direct subsidies (such as grants or payments to consumers or producers);
- fiscal policies (such as fiscal credits, exemptions, allowances, exclusions and deductions, rate relief, tax deferrals, and preferential tax treatments);
- public provision of goods and services below cost (for example, provision of infrastructure and complementary/utility services or research financing);
- capital cost subsidies (such as preferential loans, loan or liability guarantees, debt forgiveness);
- policies that create transfers through market mechanisms;
- domestic-oriented policies (such as price regulations, quantity controls, government procurement policies);
- trade-oriented policies (for example, import and export tariffs and non-tariff barriers).³¹

²⁹ See, for example, “Towards Rational Disciplines on Subsidies to the Fishery Sector: A Call for New International Rules and Mechanisms”, World Wildlife Fund, September 1998.

³⁰ See de Moor A.P.G., “Perverse Incentives Subsidies and Sustainable Development: Key Issues and Reform Strategies”, Institute for Research on Public Expenditure, The Hague, The Netherlands.

³¹ OECD (2000) as quoted in op cit.

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;
- subsidization 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 programmes;
- export promotion programmes;
- 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 a commonly agreed ground. For example, the FAO has recently launched a debate around four sets of subsidies defined as follows:

Set 1 Subsidies: Government financial transfers that reduce costs and/or increase revenues of producers in the short-term.

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

Set 3 Subsidies: 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.

Set 4 Subsidies: 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.³²

The WTO Agreement on Subsidies and Countervailing Measures (SCM Agreement) comprises more concise and circumscribed definitions. The SCM Agreement defines ‘subsidy’ with three primary components. A subsidy is defined as a *financial contribution by a*

³² See FAO “Report of the Expert Consultation on Economic Incentives and Responsible Fisheries,” Fisheries Report No. 638, December 2000.

government or any public body that confers a benefit. For an instrument to be defined as a subsidy it has to meet all three of the elements.³³

The specific issue of subsidies in Argentine fisheries can be basically approached from two perspectives; foreign subsidies and national subsidies. Subsequently, a few of the aspects of these two types of subsidies will be explored.

5.5.4 Foreign subsidies

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

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'.³⁴ Other types of subsidies, such as cross-sectoral and non-budgeted subsidies, will also be acknowledged in this analysis.

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.³⁵ The norms that preceded the formal EU–Argentina Agreement³⁶ 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 ecus³⁷ to 487,500 ecus, varying according to age of the vessel (the newer vessels receiving larger subsidies) and varying according to ships' 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

³³ 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).

³⁴ This is a classification acknowledged by Milazzo, Mateo J. “Re-examining 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.

³⁵ It is of interest to note that the EU–Argentina Accord, as well as the European regulations that preceded it, were instituted within a virtual legal vacuum in the fisheries norms. That is, the applicable norms in Argentina at the time that these types of agreements were being signed and implemented, were highly deficient and antiquated, in particular given the foreseen intensification of fisheries exploitation.

³⁶ This is a classification acknowledged by Milazzo, Mateo J. “Re-examining 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.

³⁷ Former term for the euro,€.

Rule 3944/90 before the EU Accord came into place) were 82 million ecus or US\$ 100 million.

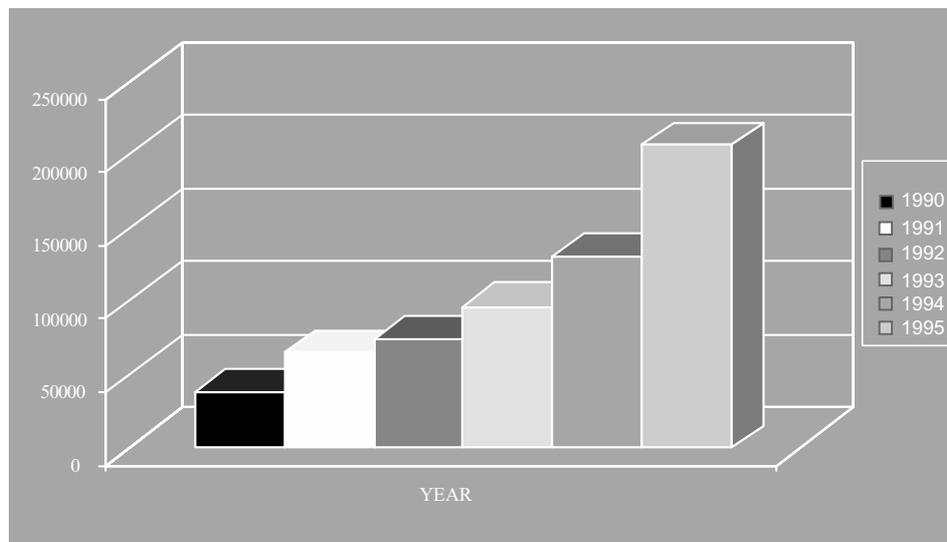
The EU-Argentina Accord also included specific items dealing with subsidies that European companies would receive when entering into joint ventures or other types of allowed associations with Argentine companies. Here, the prescribed maximum amounts vary also according to vessels' age and tonnage, ranging 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 US\$ 96 million 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 was in the sum of 28 million ecus or US\$ 33.6 million.

Therefore, just for EU-Argentine joint ventures of one sort or another, a conservative total of US\$ 230 million in subsidies for the 1990s can be identified. 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 EU norms and records from the European accounting office (Godelman, et. al., 1999). See the figure below (Figure 4) for the increase in accumulated horsepower resulting from the incorporation of European vessels through this instrument.

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 subsidized activity in OECD countries. Therefore, a

FIGURE 4
Total horsepower of freezer ships operating in waters under Argentine jurisdiction (1990-1995)



Source: SAGPyA, 1999.

series of national (or even regional, and in the case of Europe, provincial) subsidies for shipbuilding and infrastructure have been identified such as: construction subsidies, export credits, tax exemptions, or fiscal benefits. Infrastructure subsidies have also been recognized in the areas of fishing ports construction and maintenance.

The extension of the above mentioned subsidies have been impossible to fully identify at the global level, but are extensive. Some of the 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 have been accounted for at the following levels (in millions of US dollars) for 1997:

FIGURE 5
Government financial transfers to marine capture fisheries
in selected OECD countries in 1997

<i>Country/Trade Block</i>	<i>Infrastructure</i>	<i>Enforcement, and enhancement</i>	<i>Waters</i>	<i>Vessels and licence retirement</i>	<i>Investment and modernisation</i>	<i>Income support and unemployment insurance</i>	<i>Taxation exemptions</i>	<i>Other</i>	<i>Total</i>
E U	67	592	245	288	144	4	3	91	1434
Japan	2165	628	–	25	21	–	–	107	2946
Korea	164	73	–	30	–	–	–	72	342
Spain	16	37	–	196	80	–	–	15	345

Source: Extracted from OECD, 2000.

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 underpin intervention in Argentine fisheries, it can be clearly seen that some of the most subsidized fleets operate either directly or indirectly in Argentine waters.

Within the EU, it has been established that 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 percent of the EU subsidy to its total fleet went to Spanish vessels in the period 1994-1999.³⁸ Additionally, 90 per cent of European financial transfers for the support of foreign access agreements (such as the one operating between the EU and Argentina in the 1990s) were transferred to this country and its fishing industry.³⁹ 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

³⁸ See "European Union aid for the development of the fishing industry of Spain (1994-1999)", Fisheries Directorate, EU.

³⁹ See Porter, 2000.

market from waters outside the EU.⁴⁰ Spain is, as stated, the main recipient of total Argentine fisheries products.

The situation vis-à-vis subsidies and fleets from Asian countries is not as clear. The main assessments have been carried out for European capital (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 the Asian countries case since there is no accord of the type signed between the EU and Argentina. Asian cases 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, Argentina's strategy has been to open their fisheries to distant water fleets. The degree of subsidies involved for these countries have not been reliably evaluated; yet the shipbuilding industry is highly subsidized. The development of specialized and highly efficient vessels (squid jiggers) in Asian countries has permitted a specialization in squid harvesting. Distance 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 US\$ 150 to 200 thousand per year, which, for the end of the decade entailed some US\$ 10 million yearly in income. The degree of subsidies for foreign access, in the Asian countries involved, is not reported, yet the literature indicates that these governments do subsidize foreign access (Milazzo, 1997).⁴¹

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

There are whole 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 subsidized lending, tax preferences, fiscal benefits, export support, and others, exist.⁴²

⁴⁰ "Spain Annual Seafood Report" AGR Number: SP5039, US Embassy, Madrid, 1995.

⁴¹ For example, just for Japan it has been calculated that the Fisheries Agency of Japan (FAJ) spends US\$ 100 million per year on distant-water dealings.

⁴² For example, for fleets and capital operating in Argentina's fisheries (EU, Spain, US, Norway and Japan) subsidized credit has been recognized for fishing endeavours. Tax preferences have also benefited this industry from the countries operating in Argentina (in addition to the countries mentioned, the 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.

5.5.5 Domestic subsidies

Domestic subsidies are even more intricate to unravel, considering that many of them are not explicit in Argentina. Many of these transfers are not domestically defined as subsidies, but are characterized as ‘incentives’ in policy-making, creating diverging interpretation in local debates as to what is a subsidy and what is an incentive. 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 nor as to the actual real disbursement of subsidies by the Government 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 fisheries industry operating in Argentina with different capital origin has received a series of explicit and implicit subsidies as well as environmental subsidies in the 1990s.

These incentives include both general subsidies (or production incentives applied to the fisheries industry and all other industries) as well as specific subsidies just for fisheries.⁴³ These occurred during the period analysed and they were:⁴⁴

- reimbursements for processed fisheries products exported;
- reimbursements for exports from Patagonian harbours;
- fuel tax subsidy for Patagonian activities;
- environmental 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’.

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 has been in place, with an increasing percentage of reimbursement the further south the port’s location.⁴⁵ The reimbursement applied to all fisheries products until 1996 and

⁴³ For this analysis, reimbursement or remittal of national taxes to the producer of exported products has not been considered a subsidy, given that this is a mechanism used to avoid ‘exporting’ taxes.

⁴⁴ According to the Government of Argentina, and following the definition of subsidy and guidelines set by the WTO’s Subsidies and Countervailing Measures Agreement, 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.

⁴⁵ 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).

from then on just to products processed on land. The mechanism used is through a payment by customs to exporters on the basis of FOB (free on board) export value declared for products in a natural state or manufactured in the Patagonian region. The total subsidization, including all products and not only fisheries, was US\$ 92 million per year.⁴⁶

Although the level of direct impact 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.⁴⁷

Other programmes for general export promotion that have been implemented throughout the decade here analysed (either in semi-permanent levels or sporadically), involve financial support, promotion through trade missions, and partnerships between the public and private sectors. For example, the *Programa de Promoción de Exportaciones de Productos de Base Agrícola No Tradicionales* (PROMEX, Programme for the Promotion of Exports from Non-Traditional Agricultural Base) 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.⁴⁸ The programme 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, the Federal Government also offered credit lines to several exporting complexes, among them the fisheries industries, mainly 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. From the mid 1990s these are applicable to on-land processed products (not processed on board).⁴⁹

Fuel tax subsidy for Patagonian activities

Fuel tax has been subsidized during the preceding decade for all Patagonian activities. Although, as in the 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

⁴⁶ Government of Argentina, "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 1996.

⁴⁷ "El Sector Pesquero Argentino: Informe General (Preliminar II)" Universidad Católica Argentina, November 1999.

⁴⁸ This programme, 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 fair's participation) has been through funds received via the EU—Argentina Accord current until the late 1990s and slated as funds for scientific and technical cooperation in the international agreement.

⁴⁹ Resolución No. 420/1999; Resolución 967/1999, Resolución 257/2000; Resolución 1004/2000 and others.

of the main endeavours of this regional economy. Fuel taxes have been subsidized in the 1990s, through a tax exemption granted to fuel sold in Patagonia.

Environmental subsidies

Subsidies on the use of resources themselves have been identified in studies on fisheries subsidies. This occurs when access to resources is granted to fleets at a very small fraction of the commercial value of the catch.⁵⁰ That is, the removal of a publicly owned natural resource, such as fisheries, is being extracted with little or no cost to the industry.⁵¹

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 a small amount of 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.⁵²

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 period of time.⁵³ This indicates that an annual subsidy of US\$ 15 million to the industry can be identified solely in the area of management, for certain years.⁵⁴

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

Other subsidies

Other subsidies identified, following internationally agreed categorizations to date, include:

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

⁵⁰ See Gareth Porter, "Fisheries Subsidies, Overfishing and Trade", *Environment and Trade 16*, United Nations Environment Programme, August 1998.

⁵¹ 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. That is, the concept of full cost accounting, natural resource rent extraction, as well as other environmental accounting principles, are overlooked in national policy setting for the fisheries sector. It is acknowledged, however, that the issue of administration costs has not been upheld by the industry locally. It is indicated that between three and five per cent of fisheries rent should be used as a fiscal mechanism for an efficient management.

⁵² Catch fees have only been implemented since early 2001, for an estimated total income from fishing rights that will amount to some US\$ 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 from the 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 capture fees already implemented in most countries around the world. (*Source*: www.fis.com).

⁵³ Estimates by other sources are much more critical. For 2001, a collection of only 0.6 per cent of the total value of fisheries exports is foreseen. (Comunidad Pesquera, July 6 2001).

⁵⁴ See Schonberger and Agar, 1999, where it is estimated that for 1996, when Argentina's gross fisheries product was in the order of US\$ 1,500 million, only US\$ 4.3 million were recovered for management purposes, when the annual fisheries management budget for that year was roughly US\$ 30 million.

Conclusions

The analysis of fisheries subsidies and their relationship to sustainable development still lacks many pieces, not the least being working definitions accepted by most if not all parties involved. First, a thorough analysis on what is the amount of the subsidies involved today in fisheries exploitation, is missing, 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 has been pointed out, subsidizing 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 (see Porter, 1998). This has been the case in Argentina.

Furthermore, the issue of subsidies, when dealing from a sustainable development perspective, also appears to be analysed differently by different interest groups and even from confined or local analysis. Further global analysis on this issue needs to be done, given that fisheries' subsidies are sometimes classified as 'good' subsidies when perceived as having an environmentally friendly perspective when analysed strictly at the local level. To clarify, two examples of the unsound classification of 'good' subsidies can be found in the Argentine case: 1) the European subsidies employed for access to distant waters (in the case of the EU-Argentina Accord as well as previous agreements of the type) were categorized as positive subsidies given that they reduced pressure on natural resources in European waters. Nevertheless, as can be seen in this case, the outcome has been a transfer of the problem of overcapacity to distant waters; 2) 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. This programme 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, including Argentina.

As can be seen from analysis and from a policy setting point of view, work still needs to be done regarding the impact subsidies have on the unsustainable use of marine fisheries. Nevertheless, the evidence is clear that they play a negative role in over fishing practices.

5.6 Labour in the Argentine fisheries sector

5.6.1 Employment

A major component for analysis is the employment generated by the fisheries sector. The total workforce directly employed in the fisheries sector is about 24,000 people. Some estimates indicate that, in total, some 100,000 jobs (direct and indirect) depend from the fisheries sector. The industry is divided into a harvesting and a processing sector, with about 50 per cent of employment in each sector. The following analysis on labour in Argentine fisheries follows this distribution given that it clearly implicates labour variances.

Very few studies exist on the fishery labour markets, and none can truly account for recent changes (i.e. changes in the last years during the drastic drops in catch and during the biological stops). Studies' results are, at times, even contradictory. Some general esti-

mates have been made, indicating that although catch enormously increased in the last decade, between 1987 and 1996, 11 per cent of jobs connected to the fishery sector were lost. Most of these losses were in Mar del Plata where the employment rate fell 25 per cent in that period. In Patagonia, however, the employment rate increased by 37 per cent in the same lapse of time. Yet, as stated before, this data and its succeeding are far from conclusive and its veracity is even put into doubt.

Employment in the harvesting sector

The harvesting sector employs about 12,000 people. The processing fleet is the larger employer, hiring 72 per cent of workers. The ice trawler fleet hires 18 per cent of the workers, the coastal inshore fleet 6 per cent and the artisanal fleet the remaining 5 per cent.

Average employment by vessel can be estimated in:

Processing vessels:	30
Ice trawlers:	16
Coastal ships:	5
Artisanal ships:	3

Males make up the great majority of harvesting sector employees. Labour costs accounts for an estimated 50 to 55 per cent of the vessels' total variable cost.

Employment in processing activities

Total employment in the on-shore processing sector is estimated at 12,400 people, including cooperative workers (about 30 per cent of the total). Between 1987 and 1996, total employment has decreased by 11 per cent, and many plants moved from Buenos Aires to Patagonia (due to incentive measures, promotion policies, subsidies). In the hake processing plants, labour accounts for 10 to 15 per cent of all costs.

Cooperatives were developed in the early 1990s, as a means to cut labour cost and increase efficiency. Workers and *filleters* who were formerly employed in processing plants were encouraged to form cooperatives that hire their workforce out to large processing plants on a piecemeal rather than on a salary basis. These arrangements allow big firms to adapt employment to the fluctuations of the catches, and reduce costs by 30 per cent. This has created a large informal sub-sector in the processing sector. About 64 per cent of all processing workers, both formal and cooperatives, are located in Buenos Aires Province.

The growth of processing cooperatives is closely related to the changes in the employment and production patterns of the whole sector, that has resulted in the atomisation and heterogeneity of the labour force. Originally, integrated plants used to hire piecemeal services only for some surplus production; however, this is now a generalized practice. This type of action is concentrated in the Province of Buenos Aires (see Novick, et al., 1999).

FIGURE 6
Fishery processing plants, employment

<i>Processing type</i>	<i>1996</i>	
	<i>Buenos Aires</i>	<i>Patagonia</i>
Processing and filleting of fresh or chilled finfish or shell fish	376	490
Processing, filleting and freezing of finfish or shell fish	2979	2881
Salting	707	–
Canning	762	21
Fish meals and oils	106	12
Cooperatives	3303	749
Total	8233	4153

Source: Censo Pesquero, 1996.

6. NATIONAL FISHERIES' LEGAL FRAMEWORK

6.1 Constitution and environmental norms

Argentina is a federal republic. The National Constitution (of 1853 with various reforms, the latest in 1994), delineates a federal structure of government, with three branches of power: Executive, Legislative, and Judiciary. These three branches are interrelated through a complex system of checks and balances.

The country has 23 provinces and an autonomous city (City of Buenos Aires, capital of the Republic). Although the National Constitution delineates a federal model and a division of power, real political practice has been one of very marked centralism and a very strong Executive power, to the detriment of other branches.

The federal structure of Argentina divides powers and responsibilities between the Federal Government and the provinces. Traditionally, under Article 121 of the National Constitution, all powers not specifically delegated to the Federal Government are reserved to the provinces. This issue restricts, complicates, and at times hinders the development and application of federal environment-related rules and regulations.

Argentina has, in the 1990s, carried out numerous normative changes in order to bring its legislation up-to-date, as well as to accompany structural economic reforms. The main comprehensive change has been the Constitutional Reform of 1994. This reformation imbeds at the constitutional level the “right to a healthy environment . . .”. Also, a new specific division of legislative responsibilities between the Federal Government and the provinces has further been created. The Constitution states that:

“All the inhabitants have the right to a healthy environment . . . productive activities should satisfy the current necessities without compromising those of future generations . . .”

“Authorities should provide protection of this right, the rational utilization of natural resources, the preservation . . . of biological diversity . . .”

Nevertheless, although the normative changes introduce principles of sustainable development to the National Constitution, several different jurisdictions and rights over natural resources compete, and makes difficult its legal implementation. For example, navigation activities and international trade as well as inter-provincial trade fall under federal jurisdiction (Article 67 inc. 13). On the other hand, the 1994 Constitutional Reform incorporated a new definition over resource dominion, where it is stated that provinces have “original dominion of its natural resources” (Article 124), further complicating matters at this point.

Adhesion is a legislative and juridical practice whereby a province voluntarily takes on a national law ratified by the Legislative Power for their own jurisdiction. Environmen-

tal issues per se, not being a delegated jurisdiction, means that provinces must legislate over these specific matters within their borders. Many provinces have environmental issues enshrined in provincial constitutions (particularly those constitutions that have been recently reformed); most have enacted environmental laws or laws which contain partial environmental aspects, and/or have environmental dependencies within their executive branches.

Whenever jurisdiction conflicts arise regarding environmental questions, the Nation's Supreme Court has the power to resolve jurisdictional disputes arising between provinces, "between a province and the neighbours of another province; between the neighbours of different provinces" (Article 116, National Constitution).

Argentina has a major gap in legislative environmental questions, which is the lack of a general comprehensive federal law of the environment. It is the only federal country in Latin America lacking such a piece of legislation. Therefore, the country does not have a norm that provides general directions in many aspects of environmental issues, among them the primary sector of the economy. This lack is, as in the case of fisheries, partially by-passed by sectoral norms, which, however, do not adequately converge all the important frameworks related to the environment.

The intricate, and at times unclear, division of jurisdiction between national and provincial domains vis-à-vis natural resources and all other matters pertaining to the environment, the political and economic complexity behind such a law, as well as the need to bring together diverse issues and interest groups to support the approval of such a law, has meant that so far all the attempts to approve any piece of legislation along the lines mentioned have failed. Nevertheless, many bills have been presented to Congress, and several bills were even amalgamated at one point. There now follows an analysis of fisheries law examined in the light of environmental and sustainable development issues.

6.2 Background to the Federal Fisheries Law

Historically, fisheries exploitation was reserved to national exploitation. Therefore, National Law N° 17 500 of 1967 and other complimentary norms regulated this area until current the Federal Fisheries Law of 1998. During this period (i.e. 1967-1998), labour, capital investments, vessels' flags and fisheries' processing had to be Argentine and be carried-out in Argentine territory. Nevertheless, certain occasional exceptions were permitted through special international treaties (e.g. Acuerdos Marco), for fishing in Argentine territorial waters or for foreign investment made to Argentine enterprises.

- The greatest modifications took place from 1989 onward, when:
- collective labour agreements were annulled;
- the national concentrating market was disbanded;
- a registry for foreign vessels was opened;
- an international agreement was signed with the European Union to renew fleet and to allow access to foreign markets.

Up until 1991, fishing permits were unrestricted. Ships could capture any species in any amount solely by obtaining a fishing permit. Permits were granted per vessel.⁵⁵

New reforms were approved in 1991 (Decree 2236/1991), paving the way for the forthcoming agreement with the EU. With this Decree, new permits were granted (called 'restricted' permits), based on capture plans presented by fishing companies. Furthermore, a latter resolution (Resolución No. 985/1994) attempted to fix limits to the fishing capacity of vessels that would for the first time (by replacing older vessels) limit the exploitation of Argentine fisheries by an annual capture allowance. This implied that there had been a partial replacement of traditional unrestricted fishing licenses to licenses based on capture quotas and species to be harvested.

6.2.1 The Federal Fisheries Law

In an attempt to modernize and systematize dispersed norms, and after extensive parliamentary and social debate, a new Federal Fisheries Law was approved in late 1997 and sanctioned in early 1998. Federal Fisheries Law No. 24 922 is the result of these debates and multisectorial negotiations. The result is that in the fisheries sector there has been a major modification, which has meant leaving a scattered and fragmentary legislative framework in order to ratify a comprehensive Federal Fisheries Law,

The norm also changes the precarious issue of provincial domain over natural resources inherent in much Argentine legislation related to natural resources. Provincial jurisdictions are specified in current the Federal Fisheries Law (Articles 3 and 4) to encompass 12 miles from the coast.

The norm establishes objectives, defines authorities and different mechanisms that regulate all aspect of fishing activity in Argentine territorial waters. It sets control, finance and research mechanisms as well as conservation, protection and administration of living resources regimes. Further, it explicitly regulates fisheries exploitation and establishes sanctioning systems. Following is an analysis of the particular aspects of the Law.

Objectives

The Law's objectives are summarized in Article 1 and can be divided into three categories:

1. Environmental
2. Productive
3. Labour related.

All of these objectives are intrinsically inter-linked in the letter of the law.

Regarding environmental objectives, the Law states that there should be "... rational use of living resources . . ." as well as "... long term conservation of resources. . .". In addition, the "development of fisheries processes that are environmentally appropriate...".

⁵⁵ These are still current, although, as it will be seen below, there are now other sorts of licenses involved, creating a mixed system until the individual quota system is fully implemented.

Concerning productive objectives, the norm states that fisheries exploitation should promote "... exercise of fisheries seeking maximum development ...", "...sustainability of fishing activities..." and "...obtaining maximum value added (to products from fisheries)". Article 2 especially determines that fishing activities and marine living resources processing are an industrial activity. Regarding labour, the Law establishes that fisheries activities should promote the maximum employment of the Argentine labour force.

Authorities

The application authority (i.e. the division of the Federal Government charged with executing the norm) is the National Secretariat of Agriculture, Animal Husbandry, Fisheries, and Food. The Law also established the creation of the Federal Fisheries Council, a collegiate organism with representation from national and provincial authorities.

The Law originally established the creation of a Fisheries Secretariat in order that the activity would have an executive agency with greater autonomy and hierarchy within the national administration. This was vetoed by Presidential Decree before the norm was sanctioned.

Given that the Secretariat of Agriculture, Animal Husbandry, Fisheries and Food of the nation is the application authority of the Federal Fisheries Law, this area of federal government has specific functions outlined by the norm (Article 7). Therefore, the Secretariat is in charge of implementing fisheries policies, regulating exploitation, supervision, and research. The particulars mentioned in this regard are:

- supervision of total allowable catches;
- issuing of quotas per vessel, species, area, and type of fleet;
- granting of fishing permits;
- calculation of available surplus;
- establishment of biological stops;
- application of sanctions;
- establishment and implementation of control systems to determine real capture in Argentine jurisdiction.

The Federal Fisheries Council

This organism is a collegiate body established by the Federal Fisheries Law presided over by the Secretary of Agriculture, Animal Husbandry, Fisheries, and Food, with representatives from other areas of the national government and from all provinces with maritime coasts. Its functions are to:

- set a national fisheries policy;
- establish a research policy;
- determine total allowable catch;

- approve experimental and commercial permits;
- regulate artisanal fishing;
- establish extraction rights and royalties;
- modify the distribution of income from the National Fisheries Fund (FONAPE).

According to the Law, the establishment of a fisheries policy should be based on research and recommendations carried out by the National Institute for Fisheries Research and Development (*Instituto Nacional de Investigación y Desarrollo Pesquero* - INIDEP).

Research guidelines of the Federal Fisheries Law

The National Institute for Fisheries Research and Development is the organism in charge of carrying out research on fisheries based on the requisites and objectives dictated by the FFC to that effect. The Law states that INIDEP is an autonomous organism.⁵⁶

The results of its research are presented to SAGPyA and explained in English before they are disseminated or used. Private companies exploiting living marine resources have the duty to report data of their activities to be used for scientific investigation

Regulations on the conservation, protection and administration of living marine resources

The FFC can impose fishing restrictions in order to avoid excessive exploitation and to prevent environmental or ecological damage, according to the norm. The SAGPyA can establish biological stops by zone or time periods, as well as establish reserved resources and fishing zones. Besides its own control organisms, the Secretariat is also entrusted with the coordination of all control and surveillance agencies dealing with fishing vessels and living marine resource exploitation.

The Secretariat, together with the Ministry of Foreign Affairs, must organize and maintain a system of fishing regulation in the areas adjacent to the EEZ when dealing with migratory resources or when dealing with species associated to the Zone.

Fishing practices

To be able to fish in areas under Argentine jurisdiction, it is stated that the vessels should have a permit. However, this permit only allows access to the fishing zone. Besides the permit, each ship must be granted a quota of capture per species, in the case of existing as well as future permits.

To this effect, the Federal Fisheries Law has the authority to regulate an administrative system of fisheries resources through the implementation of capture quotas (by species, vessels, fishing zones, and type of vessel). Moreover, all permits are temporary and there are restrictions so that no one company or holding should be granted the total TAC of any one species. A series of criteria will also be taken into account when granting quotas, such

⁵⁶ By Argentine administrative law there is a difference between an autonomous and an independent (or "autárquico") organism. An autonomous organism, such as INIDEP, can set its own administrative make-up yet it cannot establish its own policies, budget, or determine its executive personnel. On the other hand, independent organisms within public administration can carryout these policies.

as employment, investments, and previous fishing records (amounts captured as well as sanctions).

Capture quotas would be totally or partially transferable through the payment of transference fees. Transference of quotas will not be allowed from ice trawlers to processing fleet.

The exploitation of live marine resources can only be carried out by ships under the Argentine flag, except when dealing with national companies with more than five years of activity. The latter can charter foreign ships for up to 36 months when capturing under-utilized or unexploited species.

International issues in the Federal Fisheries Law

Access to Argentine waters by foreign vessels is permitted through international treaties for unexploited or under-exploited species. However, several considerations are regulated in the Federal Fisheries Law in this regard, such as:

- opening-up the markets of the foreign contracting country;
- conservation of resources in the area adjacent to EEZ;
- reciprocal rights for the Argentina fleet to fish in the waters of the contracting country.

According to this sector of the norm, foreign concessions should not affect reserves imposed favouring national vessels. Furthermore, these have to be carried out in conjunction with Argentine companies, employ up to 50 per cent of national crew, unload the capture in Argentine harbours, as well as meet with other local norms. In addition, there has to be an agreement not to re-export products.⁵⁷

Crews

The law establishes nationality reserves of Argentines for the totality of officers and captains, and for 75 per cent for the rest of crew (crew can also be of different nationality after having resided in the country for more than ten years). Foreign temporary personnel can be hired if there is a shortage of national crew.

National Fisheries Fund (FONAPE)

The FONAPE is a special account made up of funds drawn from royalties, fishing permits, penalties, sale of products or sale of decommissioned vessels, and other such income. The fund is administered by the Secretariat of Agriculture, Animal Husbandry, Fisheries, and Food with the participation of the Federal Fisheries Council. The Fund is shared between the Federal Government and the governments of maritime coastal provinces.

The main purpose of this fund is to finance, control and survey INIDEP training activities. However in practice it also funds staff salaries and honoraria.

⁵⁷ The clauses relating to international issues present in the Federal Fisheries Law are not applicable to the EU Agreement given that the accord with Europe was ratified prior to the national law's adoption.

Infractions regime

A wide and strict sanction regime for different activities that breach fishing norms is established. Penalties that vary from the equivalent of US\$ 10,000 to US\$ 1 million can be applied. Aggravating circumstances (gross infractions or re-incidence) can raise penalties up to the equivalent of US\$ 2 million. Other, non-monetary penalties can also be applied, such as the suspension or cancellation of permits and the confiscation of fishing gear and ships.

Conclusions

The current norm, it is agreed, is not the best law for a country with a fisheries sector in crisis, given that it is a norm that mainly promotes fishing and fishing activities without adequate sustainability caveats. The law has a productivist and extractive bias. For example, in the norm there are no indications to alternatives to the extractivist bias, such as the promotion of aquaculture or other production developments.

Nevertheless, it is also agreed that the norm introduces changes to modify a system of open fisheries to one based on rights. Notwithstanding this, it should be pointed out that the norm and the systems it professes are not totally applied.

The Federal Fisheries Law is not drafted with what is generally accepted as an environmental or a sustainable development perspective. Although it does introduce certain partial environmental perspectives, it does not follow modern and current environmental/sustainable development legal viewpoints. It is not a 'properly environmental' norm, as understood in current legislative analysis, it only incorporates some environmental issues as secondary aspects. Environmental faculties are reduced to two applicable elements in the norm: restricting fishery activities and coordination of control/surveillance mechanisms. Furthermore, the Law does not apply many of the environmental principles established by the Argentine Constitution.

The Federal Fisheries Law has substituted dispersed and dated norms that concentrated most decisions on the Federal Executive Power. It can be concluded that the introduction of a Federal Fisheries Council is a step forward in deliberating and conciliating national and provincial perspectives. Nevertheless, in some critical areas, the Council does not have the necessary authority to operate.

Control and surveillance activities are largely hindered, given that the national authority in charge of applying the norm has a functional dependency on other public organisms that do not directly respond to the application authority (the Coast Guard, the Navy, etc.).

It can be generally concluded that although in some aspects the law is quite current, the norm's effectiveness is deficient. That is, although the statute has many positive components, the enforcement per se has been insufficient. This is the case particularly in two areas: control and surveillance again, and the application of sanctions. Regarding the latter, it is found that, for example, procedures for the application of sanctions are bureaucratic and slow, and when applied after a long period they lack effect. Concerning sanctions, although high penalties could be applied for infringing the law, the penalties applied tend to be so low on average that they are economically irrelevant, and do not have a dissuasive

impact. Furthermore, although it has been found currently that over 30 per cent of permits are 'irregular' they continue to function for long periods without sanctions.⁵⁸

The main deficiency currently concerning the Federal Fisheries Law is the application of quotas, arguably the essential component to the norm. Although recently there have been several activities conducive to applying the quota system, this insufficiency has even led to the perception by public opinion and even by some stakeholder groups that the norm is not applied in its totality.

The implementation of the quota system has not been applied for several reasons, the manifest ones being difficulty to do so and administrative lassitude. Furthermore, several stakeholder groups, such as some sub-federal governments and private interest groups, resist the quota system. The opposition is, consequently, a key issue to address in order to implement an orderly transition without obstruction from interest groups.

⁵⁸ This is one of the management areas that has changed in recent times, not only in the reviews but also with respect to more profound shifts. For example, the Senate is reaching consensus with the Executive Power to introduce changes in order to speed administrative matters in the application of sanctions, improving the norms' effectiveness.

7. INTERNATIONAL LEGAL FRAMEWORK FOR FISHERIES

7.1 Background to the international legal framework for Argentine fisheries

Internationally, Argentina has been an active agent in the formulation of global norms related to the sea and to the exploitation of maritime resources. Considering the country's geographic situation and particular interests, it has impelled and subscribed to numerous bilateral, regional and international treaties in this subject as well as tangential issues.

Argentina, as a general rule, tends to subscribe to and ratify international treaties. The Argentine Congress (both chambers) must ratify international treaties that have been subscribed by the Executive Power. Subscription is carried out via the *Ministerio de Relaciones Exteriores* (the Foreign Office) which is also the division of federal government in charge of negotiating bilateral, regional and global treaties.

Without the Legislature's approval, any treaty, even when it has been subscribed by Executive Power, has no internal validity. For the application of the treaty, it needs further specific decree regulation to be drafted by the Executive Power, just as for nationally originated laws. Obligation to prosecute arises once all these steps are completed. The National Constitution gives greater hierarchy and supremacy to international treaties than to national law. Some of the main international accords Argentina is a party to directly dealing with fishing activities, are highlighted below. Besides these, Argentina is also party to a multiple number of other international norms and accords that tangentially deal with fisheries or impact on fisheries (for example, the agreement on maritime pollution, high seas safety, double flag, etc.).

Tratado del Rio de la Plata y su Frente Marítimo/Treaty of Rio de la Plata and its Maritime Front

The Treaty was subscribed by Argentina and Uruguay in 1973. It determines the Common Fishing Zone (*Zona Común de Pesca*) for both countries, projecting from the mouth of the shared river (*Rio de la Plata*), and including the ocean zones corresponding to each of the nations. The Treaty establishes the *Comisión Técnica Mixta del Frente Marítimo Argentino-Uruguayo* (CTMFM) (Technical Mixed Commission of the Argentine-Uruguay Maritime Front), which implements several aspect of the accord, such as management issues and others related to fisheries.

United Nations Convention on the Law of the Sea

As a coastal country, Argentina actively participated in the long-drawn international debate leading to the United Nations Convention on the Law of the Sea. The Convention

was subscribed to in 1982, yet Congress only ratified it in 1995. This accord legally established the 200-mile Economic Exclusive Zone (EEZ) for fishing rights for coastal countries and sovereignty over living marine resources.

The *Prefectura Nacional* (the Coast Guard) is in charge of the control of Argentine maritime zones (EEZ) vis-à-vis navigation in general, and also in the specific case of fisheries. This is to prevent possible infractions, as well as for periodic or possible vessels controls. These controls can take place on harbour or in navigation.

In the specific case of fishing boats, the *Prefectura* designates an inspector and, in accordance with the Federal Fisheries Law, all activities should be coordinated with the federal authorities in charge of the area of the Executive Power. The Argentine Navy (*Armada Argentina*) can in special cases intervene in the detention of vessels when faced with possible infractions.

Agenda 21

Argentina subscribed to Agenda 21 during the United Nations Conference on Environment and Development of 1992. Given that this is a non-binding action plan, it did not need national ratification procedures. Nevertheless, the debates ensuing after the drafting of Agenda 21's Chapter 17, ("Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas, and the protection, rational use and development of their living resources"), were the driving force that led to the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks. Argentina took an active and high-level role in the Conference's international debates.

United Nations Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks

Argentina was an active participant in the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks, and it is a signatory country to the accord ensuing from this Conference. To date this accord has not been ratified by sufficient nation-states to become internationally applicable.

The Argentine Parliament has ratified this agreement.⁵⁹ In order for the norm to be applicable within national jurisdiction, it needs one more legal step, which is ratification by the Executive Power via an executive decree.⁶⁰

Antarctic Treaty

Argentina is party to the 1959 Antarctic Treaty, where the fishing area that conforms the Treaty is defined, as is the conservation of marine ecological systems in the Antarctic. Argentina has ratified several other norms related to this Treaty (such as protocols).

⁵⁹ National Law No. 25290 "APROBACION DEL ACUERDO SOBRE LA APLICACION DE LAS DISPOSICIONES DE LA CONVENCION DE LAS NACIONES UNIDAS SOBRE EL DERECHO DEL MAR RELATIVAS A LA CONSERVACION DE PECES", becoming effective on August 17 2000.

⁶⁰ However, there is a strong doubt that the Accord will ever be ratified by Argentina. The convenience to do so is currently being debated and there is a great deal of resistance from different private and national public sectors.

A recent ratification is Law No. 25 263⁶¹ which regulates fisheries in the Antarctic zone, and which determines a functional relation to the Federal Fisheries Council since it is this organism that should grant fishing rights in this area to Argentine vessels. The norm also establishes management guidelines (control, surveillance and research).

Code of Conduct for Responsible Fisheries

Argentina, as a member of the FAO, adheres to that organization's Code of Conduct for Responsible Fisheries. The Code includes several new measures and aims for fisheries, such as the 'precautionary principle'. It also promotes several 'conservation and rational utilization' standards, as well as regional perspectives to fisheries. The Code itself is of voluntary application. Nevertheless, several of its principles are taken and conveyed into other mandatory norms (such as the National Fisheries Law of Argentina and the United Nations Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks).

Convention on Biological Diversity

Argentina is a signatory country to the Convention on Biological Diversity.⁶² Therefore, Argentina has ratified its international commitment to "the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources". Besides including some of these aspects in the National Constitution reform of 1994, several of the issues of sustainable use and conservation of biological diversity have permeated to national legislation directly related to fisheries.

7.2 Fisheries Agreement with the European Union

Acquiescing with the general opening of the Argentine economy, and in the format of agreement, the Accord on Relations on Marine Fisheries with the European Community was subscribed in 1992. It was approved by National Law No. 24315 in April 1994⁶³ and became effective by Decree 685 in May 1994.

After years of negotiation between the European block and the Argentine Government, this agreement took as its backdrop, the United Nations Convention on the Law of the Sea and a few of its concepts, which (in the letter of the law) are articulated as the Accord's mandates. Nevertheless, the norm was a forceful instrument that regulated European capital and vessels for the operation of distant fleets. The Accord was approved for a period of 5 years (1994 - 1999). Automatic renewal was foreseen for two years, unless one or both parties would solicit its suspension.⁶⁴

⁶¹ National Law No. 25 263 "REGIMEN DE RECOLECCION DE RECURSOS VIVOS MARINOS EN EL AREA DE APLICACION DE LA CONVENCION PARA LA CONSERVACION DE LOS RECURSOS VIVOS MARINOS ANTARTICOS (CCRVMA), becoming effective on July 25 2000.

⁶² The Convention was ratified by National Law No. 24 375.

⁶³ "ACUERDO SOBRE LAS RELACIONES EN MATERIA DE PESCA MARITIMA CON LA COMUNIDAD ECONOMICA EUROPEA".

⁶⁴ The Accord is currently abridged by request from Argentina. It was not renewed and its expiry date would have been, nevertheless, May 2000 had it not been abridged. Although other sorts of accords are being discussed with the EU, there has been no real progress in this area to date.

Within the framework of fleet restructuring, the Community would facilitate the incorporation of vessels from the EU (see section on subsidies). The companies to be established had to be of joint venture or temporary association types. Argentina agreed to facilitate the transference of fishing permits, and would issue new ones following the terms of the accord. That is, for resource exploitation, a series of mechanisms and combinations dealing with investment, finance, access to fisheries, among others, were specifically set. The common characteristic, however, is that the new enterprise formats had to be associations with European fishing companies or European capital.

It was also explicitly established that the "transformation of Argentine fisheries resources would be within a perspective of priority supply to the Community's market". Therefore, a reciprocity component of sorts was established, given the access to European markets. Unfortunately however, this component was diluted for Argentine purposes, given that GATT norms, implemented after this particular treaty, have extended the access of the European market to other nations. Therefore, the relative advantage for Argentine products that this particular accord would derive was weakened. The agreement went further into detail, to regulate the species to be fished, the maximum captures, the incidental catch, and other issues related to the management of resources.

Besides its implicit goals, in its first article the Agreement states that the principles and norms of the accord refer to the "conservation, exploitation and transformation" of fisheries resources. To support fisheries exploitation, one of the expressed conservation objectives of the norm is the joint research to promote preservation and conservation of living resources (Article 3).

Following these explicit goals, it was determined that the parties would carry out joint studies for the preservation and conservation of living resources. Additionally, the Community would finance the development of new technologies to allow for the rational exploitation of the resources. The provision of resources and assistance for technical and scientific cooperation was established in the maximum amount of 28 million ecus.

In the possible case of needing to apply conservation measures (such as biological stops, suspension of fishing, fishing zones, etc.), Argentina pledged to take these in a non-discriminatory manner and based on 'objective scientific criteria'. Nonetheless, these measures have to be agreed with by the Mixed Commission created by both parties to direct the application of this treaty. In addition, the revision of financial support was contingent upon the TAC.

The Mixed Commission had as its duties, to select the projects (that is the joint ventures and temporary companies) that would be approved to operate under this accord, and obtain subsidies from the EU. Other obligations were to evaluate programmes, control administration and supervise the fulfilment of proposed projects, as well as supervise the use of the financial assistance involved. The Commission also acted as the dispute settlement mechanism. The Mixed Commission, therefore, dealt with significant issues in directing and applying fisheries policy. As can be seen, this joint committee was in charge of several different aspects without adequate checks and balances

This Accord was key in the activity and fishing policy. As a result an enormous flow of capital and material resources were transferred toward Argentine fishing activities. Although it was formally agreed that measures had to be taken in order to safeguard management (such as the substitution of vessels in order not to exceed installed capacity for example) the bilateral commission in charge of overseeing the implementation of the

Accord did not attend to these. In the Accord, it is explicitly stated that fishing capacity would not be exceeded, yet the Mixed Commission approved—as a whole—an assemblage of projects that far exceeded that capacity. Furthermore, ships that were to have been replaced continued fishing de facto, and were not ‘retired’ nor ‘modernized’ as was presumed by the Accord. Vessels that had more fishing capacity than was permitted, would request (and be granted) permits to continue capture, by devising legal figures that did not exist in national legislation nor in the Accord with the EU.⁶⁵

Permit granting, by national authorities as well as approval exercises by the Mixed Commission, did not keep with the explicit agreed concepts and limitations of fishing capacity. The end result of the Accord, has been a substantial and net increase in fishing capacity.

FIGURE 7

Accumulated vessels’ horse power for freezer fleet per year

<i>Year</i>	<i>HP</i>	<i>Accumulated HP</i>
1986	21.867	21867
1987	8.400	30267
1988	6.332	36599
1989	0	36599
1990	1.995	38594
1991	26.463	65057
1992	9.847	74904
1993	21.789	96693
1994	34.454	131147
1995	75.311	206458

Source: National Ships Registry as quoted in Godelman, et al., 1999.

7.3 Administrative layout of the fisheries sector in Argentina

7.3.1 National Administration

The policy and administrative arrangement of fisheries issues in Argentina is highly elaborate. First, it must be taken into account that Argentina is a federal country whereby Constitutional designation, dominion, and property over natural resources corresponds to provinces in general. Nevertheless, all subjects related to navigation and international trade fall under national jurisdiction. In the specific area of seas, provinces have jurisdiction up until 12 miles, while the rest of the EEZ is under national jurisdiction. Therefore, an assortment of different policies and administrative units co-exist and at times overlap. In the following is a characterization of the most relevant areas, as well as a scheme of how they interact.

⁶⁵ Godelman, et. al., op. cit.

The Secretariat of Agriculture, Animal Husbandry, Fisheries and Food

The Secretariat of Agriculture, Animal Husbandry, Fisheries and Food (*Secretaría de Agricultura, Ganadería, Pesca y Alimentación*) is a second-tier division of the Ministry of Economy. It is also the current maximum authority (implementation authority) at the national level in fisheries policy, and the Secretary presides over the Federal Fisheries Council (*Consejo Federal Pesquero*). Within the Secretariat, the specific area dealing with fisheries is the National Fisheries and Aquaculture Directorate.⁶⁶

The Secretariat is, as stated above, the implementation authority charged with conducting and executing policy as fixed by the Federal Fisheries Council. It also has enforcing and control authority, and it is decentralized to a certain degree in local district offices and delegations (generally established in the main fishing harbours of the country).

The National Institute for Fisheries Research and Development (INIDEP) is an autonomous division of the Secretariat. INIDEP is the main and official research organization in the country oriented toward the development of fisheries. In this capacity, it is charged with the assessment of stocks as well as conducting research and technical work in other areas of marine matters. INIDEP has a programme of on-board research assessment and observation of fishing practices, and collects extensive amounts of data on fisheries resources. The Federal Fisheries Council sets INIDEP's general areas of work. INIDEP also recommends the TAC amount to the Federal Fisheries Council, based on information determining maximum sustainable yield (MSY).

The National Agroalimentary Quality and Safety Service (*Servicio Nacional de Sanidad y Calidad Agroalimentaria*)—SENASA—is also an autonomous body of the Secretariat. This organism controls food safety and inspects products consumed nationally and exported. It also acts as certifying entity of processing plants for *foreign markets*.

The Ministry of Foreign Affairs, International Trade and Religion

The Ministry of Foreign Affairs, International Trade, and Religion (*Ministerio de Relaciones Exteriores, Comercio Internacional y Culto*) is the primary area of national government to deal with foreign and international concerns. As such, it includes several areas that directly and tangentially deal with fisheries issues and international trade. The Ministry is in charge of foreign policy and international negotiations. Therefore, it is an important component of all international agreements negotiated by the country. It has several units dealing with topical areas such as global issues (where the Division of Environment is set), the Antarctic area, and the Malvinas Bureau. The Ministry has a seat in the Federal Fisheries Council.

The Secretariat of Sustainable Development and Environmental Policy

The Secretariat of Sustainable Development and Environmental Policy (*Secretaría de Desarrollo Sustentable y Política Ambiental*) is a second-tier division of the Ministry of

⁶⁶ This structure is current as of the latest national administrative changes of December 1999. Although some of the literature and reports refer to the Under-Secretariat of Fisheries, this division does not exist any longer.

Social Development and Environment. The Secretariat deals with environmental and conservation issues, such as environmental quality, natural resource management, and biodiversity. It has a seat in the Federal Fisheries Council.

7.3.2 The Federal Fisheries Council

The Federal Fisheries Council (*Consejo Federal Pesquero*) is a new figure in the administrative scheme established by National Law No. 24 922 of 1998. The Council is presided over by the Secretary of Agriculture, Animal Husbandry, Fisheries and Food, and has representation from the above mentioned divisions of government (that is, the Ministry of Foreign Affairs, International Trade and Religion as well as the Secretariat of Sustainable Development and Environmental Policy) from national government. The President of Argentina names two other representatives. Furthermore, there is one seat for each of the maritime provinces.⁶⁷ The Council is in charge of setting fisheries policy.

7.3.3 National Parliament

Argentina has a national two-chamber parliament with representation from all provinces and the Federal District of Buenos Aires in both houses. Within both chambers (Upper and Lower), special thematic committees exist. These committees generate and evaluate legislative proposals and have the legal capacity to act as a check-and-balance mechanism for other divisions of government (i.e. Executive Power and Judicial Power). Following are presented descriptions of both house committees specifically dealing with fisheries. Nevertheless, given the cross-sectoral aspect of many activities related to fisheries, bills and other legislative instruments must also be debated and/or approved by other committees if the subject calls for it.

National Senate (Higher Chamber)

The National Senate's Committee on Fishing, Maritime and Harbour Interests (*Comisión de Pesca, Intereses Marítimos y Portuarios*) is the specific area within Senate to deal with fisheries issues. It has distinct yet very wide capacity to pronounce itself on:

*“all matters related to the exploitation in terms of sustained use for all of the sea's living resources; to the administration, investigation and destiny of economic resources drawn from surpluses; harbour assistance; industrialization linked to fisheries potential of the Argentine sea's continental platform, incentives to aquaculture, sanitary control, fisheries statistics and information, shipbuilding industry related to fisheries and all matters related to fisheries exploitation.”*⁶⁸

Chamber of Deputies (Lower House)

The Chamber of Deputies also has a permanent committee that deals with fisheries issues specifically. The Committee on Fishing, Riverine, Fishing and Harbour Interests of

⁶⁷ The provinces with maritime coasts in Argentina are five: Buenos Aires Province and the four Patagonian provinces of Rio Negro; Chubut; Santa Cruz and Tierra del Fuego, Antarctic and Islands of the South Atlantic.

⁶⁸ Art.76 del Reglamento del H.S.N.

the Chamber of Deputies has as its domain to deal with “everything concerning the preservation, development and exploitation of renewable and non-renewable sea, river and interior water resources; implement the harbour and navigational system; harbour policy and navigational activity; research and exploitation of fisheries activities in all its manifestations and the promotion of the shipbuilding industry; maritime and riverine transport.”

7.3.4 Sub-Federal Government

Several levels of the Sub-Federal Government have an important role to play vis-à-vis ocean fisheries in Argentina. First, all coastal provinces do have a specific area dealing with fisheries within provincial government (where, within provincial administration, this dependency is located, varies from province to province). All maritime coastal provinces do have, by law, a seat in the Federal Fisheries Council. In some cases, many municipal governments in fishing communities do have administrative areas on the subject, although they have little or no jurisdiction in most fisheries-related issues.

7.3.5 Control and enforcement

Several specific areas of control and enforcement are part of federal government. First, as stated above, the Secretariat of Agriculture, Animal Husbandry, Fisheries and Food has an area in charge of surveillance with inspectors. Furthermore, the Secretariat runs the MONPESAT satellite system for ship monitoring. Other areas of control and enforcement are outlined below. Enforcement and surveillance falls under two categories:

1. Control of the Argentine flag fleet.
2. Control of foreign fleets operating illegally within and/or approaching the country's Economic Exclusive Zone.

Prefectura Naval (Coast Guard)

The Coast Guard is in charge of overseeing that vessels meet with current regulations, in the areas of capture, fishing gear, crews, as well as safety control. The Coast Guard also provides onboard inspector officials. The Coast Guard is part of the Federal Ministry of Interior and collaborates with provincial governments.

The Armada (the Navy)

The Navy also fulfils control and surveillance obligations of national pavilion and foreign fleets. Aerial and ship controls take place throughout the EEZ and neighbouring regions. The Navy is under the dominion of the Defence Ministry. The Navy also runs the *Escuela Nacional de Pesca*, a fishing training school for those involved in fisheries occupations (not for enlisted personnel).

Conclusions

As can be expected in a cross-sectoral and complex issue such as ocean fisheries, many other areas of government can have a tangential intrinsic impact on fisheries. Al-

though the above are the main policy-setting and implementation areas related to fisheries, there are many others that do have a role (either permanently or temporarily), areas such as labour, coordination mechanisms within the Government, official research institutions, etc. As can be seen, there are many overlaps in jurisdiction, such as the overlap between federal government and the provinces, and among different divisions of government with feasibly distinct perspectives. Although the creation of the Federal Fisheries Council is an attempt to work out these areas of tension, some of the strains still remain, particularly among national administration and provincial administrations as well as between different provinces.⁶⁹

7.4 Regional fisheries bodies

Argentina is part of several regional and supra-national commissions dealing with ocean fisheries, as can be expected from a coastal country which shares several of its resources.⁷⁰ The most important of the regional fisheries bodies are listed below.⁷¹

Comisión Técnica Mixta del Frente Marítimo Argentino-Uruuguayo—CTMFM/ Technical Mixed Commission of the Argentine – Uruguayan Maritime Front

This Commission deals with the Argentine-Uruguayan Common Fisheries Zone (*Zona Común de Pesca Argentino—Uruguaya —ZCP*), and is created by the River Plate Treaty and its Maritime Front (*Tratado del Río de la Plata y su Frente Marítimo*) of 1973. Member states are Argentina and Uruguay.

The Commission deals with plans and measures conducive to the preservation and rational use of living marine resources. It also deals with the establishment of maximum capture volume per species. The maximum recommended capture volumes are then assigned and distributed between both countries. The Commission also promotes joint studies between both nations, dealing with rational exploitation and conservation of marine resources, as well as with subjects related to the subject (such as marine pollution, for example).

For research and development purposes, the Commission tends to organize working groups along a particular resource (i.e. a particular exploited species) or particular subjects (for example, fishing gear or pollution problems), although these can vary periodically according to the need for inquiry. This work is then channelled for the elaboration of management programmes of fisheries in the Common Fisheries Zone, negotiated between the two countries.

Comisión de Pesca del Atlántico Sur / South Atlantic Fisheries Commission

This Commission was created jointly by Argentina and the United Kingdom in 1990. It attempts to gather information from both nations on harvesting and fishing efforts for pre-

⁶⁹ See *Actas del Consejo Federal Pesquero*.

⁷⁰ Argentina is also a member of FAO's Committee on Fisheries (COFI).

⁷¹ Argentina has taken part in many other fishing commissions and committees throughout recent periods. Nevertheless, many of these have fallen inactive. For example, the Regional Fisheries Advisory Commission for the Southwest Atlantic (CARPAS), established by the FAO in the early 1960s and made up of Atlantic coastal states south of the Equator, which are also members of the international organization, has not been active since the mid 1970s.

determined species. The Commission evaluates information and submits counsel to both countries involved regarding actions to take for sustainable management, joint scientific research, monitoring fishing, and take up issues of shared jurisdiction or migratory stock. In particular it deals with management of certain species of finfish and molluscs: *Illex argentinus*, *Loligo gahi*, *Micromesistius australis*, *Macruronus magellanicus*, *Merluccius australis*. In particular, its concern is Argentine shortfin squid (*Illex argentinus*). The Commission only deals with the circumscribed area between latitude 45° and 60° S in the south-west Atlantic.

*Comisión para la Conservación de los Recursos Vivos Marinos Antárticos—CCRVMA/
Commission for the Conservation of Antarctic Live Marine Resources*

Several countries with claims upon the Antarctic created the Commission in 1980, and it deals with the conservation of living maritime resources in the Antarctic Sea. Its aims are to control fishing in areas under suspended or special sovereignty. Further to conservation efforts, the Commission compiles information and it acts as a data dissemination body on issues related to Antarctic living resources.

8. FISHERIES INDUSTRY STRUCTURE

The industrial structure of the Argentine fisheries system is extremely complex, and data and available information are not comprehensive, homogeneous nor well developed. This poses additional problems for a careful description of the dynamics of this industry, its sub-sectors and agents. Hake, together with squid, are the main products of this productive system, which are exported in a high proportion as a commodity, without further industrialization process (mainly as frozen fillets for hake).

Furthermore, in a general vision, there are two main production sub-sectors within this industry: the harvesting and the industrial. These activities may be performed by different agents, or they may be integrated in different ways: ship harvesting and on-board industrial plants, integrated firms with ship harvesting and on-land industrial plants, or a combination of the two. Economic groups operating in this industry may have several integration forms. National and international distribution channels are part of the sub-system. Related industries and services are also relevant, with packaging, transportation, distribution, logistics and port infrastructure among the most important. Fuel, water, ice production and electric energy are important inputs. In addition, consumption patterns, national and international market regulations, public and private institutions and organizations are relevant factors in the system dynamics.

The structure of firms of this activity is also complex and heterogeneous, and for this reason, difficulties arise when trying to propose a relevant typology of agents in the sector. Firms include, among others, artisanal family-operated boats, small coastal vessels, independent ice-trawlers, ice-trawlers integrated with on-shore plants, independent freezer and factory vessels, and freezer vessels integrated with on-shore plants.

There have been important developments in infrastructure and processing plants, in the southern ports of *Puerto Madryn*, *Puerto Deseado* and *Ushuaia* following technological changes during the 1990s. These changes have manifested themselves (in addition to displacement of the activity towards the Patagonian region) in new firm management and operating forms related with factory vessels and integrated firms.

As a general remark, the same trends towards concentration and transnationalization observed in the rest of economy are found in the fisheries sector, trends that were deepened in the 1990s. At the same time, the most important seafood firms performed a clear export-orientation strategy, and have developed well-established networks with international markets and distribution channels.

In the following section, available relevant information is presented (although not fully comprehensive and sometimes also partially representative), for the purpose of a typology of actors; the organizational structure of the sector (trade unions and business associations), and some estimations of the probable social impacts on employment following

the hake crises. This analysis will concentrate on the harvesting and on-shore processing sub-sectors.

8.1 Harvesting sub-sector

Although no comprehensive studies on the industrial structure of the extractive sector exist, the level of concentration in the hake fishery appears to be high. INIDEP estimates that even though the number of business groups that own vessels which harvest hake has increased from 49 to 98 between 1987 and 1996, a small group of firms control a majority of the hake landings: the largest 10 per cent of the firms control over 70 per cent of the catches while 77 per cent of small and medium sized firms control only the 10 per cent of the catches.

Fleet composition

According to size, range and operational mode or fishing gear, the fleet can be grouped into three types: coastal or inshore vessels, ice trawlers and processing vessels.

FIGURE 8

Fleet composition

<i>Fleet type</i>		<i>Number of vessels</i>	<i>%</i>
i) Inshore		310	42
	Artisanal	186	25
	Coastal	124	17
ii) Ice Trawler (fresqueros)		133	18
iii) Processing ships		288	40
	Factory	17	2.3
	Freezer (arrastreros)	103	14.2
	Longline (palangreros)	23	3.2
	Scallop (vieyeros)	4	0.6
	Shrimp (tangonero)	32	4.4
	Surimi	5	0.8
	Squid, (poteros)	104	14.3
Total		731	100

Source: Schonberger et al., 1999, from SAGPyA.

In the 1990s, the number of freezing and factory vessels grew rapidly: in terms of landing, they accounted for 28 per cent of the total landings in 1989 and of 67 per cent in 1998. The Mar del Plata fleet is primarily composed of ice trawlers that landed 48 per cent of the port's catches, followed by inshore boats that landed 26 per cent and the freezer ships with 25 per cent.

In the Patagonian ports, the processing fleet predominates. Landings in the Patagonian region have increased dramatically (from 39 per cent to 64 per cent between 1991 and 1998), reducing the Mar del Plata share from 90 per cent in the 1980s to 31 per cent in 1998.

The main characteristics of the fleet are:

1. **Inshore fleet:** Coastal boats are the most important and technologically more advanced. This fleet consists of boats ranging 17 to 25 metres in length and possess larger and refrigerated holds. They account for 88 per cent of total landings, while representing only 40 per cent of the boats. Mar del Plata (65 per cent) and Rawson (21 per cent) are the main operating ports.

Artisanal vessels (60 per cent of the total), account for the remaining 12 per cent of total landings; they are smaller—10 to 17 metres in length—and do not possess any cooling equipment; they pack their catch in ice. They are concentrated in Mar del Plata (70 per cent of the total) and are family operated.

2. **Ice trawler fleet:** They range from 25 to 63 metres in length, possess refrigerated holds but don't process the fish on board. The fish are preserved in layers of ice. The fleet provides chilled products to processing plants on shore. This operation tends to be vertically integrated: most of the boats are owned by firms which have on-shore plants in Mar del Plata, Puerto Madryn, or Comodoro Rivadavia. Most of the ice trawler fleet (77 per cent) operates from Mar del Plata

3. **Processing fleet:** These consist of freezer (*arrastreros*), factory (with fishmeal plants), surimi, scallop, and shrimp trawlers, jiggers and longliners. The trawler component varies in size depending on the resource they exploit. This fleet chills the catch and does some processing on board. Jiggers concentrate on squid, while large trawlers target squid and hake. Most of the freezer fleet operates in Puerto Madryn (26 per cent), Puerto Deseado (25 per cent), Punta Quilla (24 per cent) and Mar del Plata (18 per cent). Most of the factory fleet operates in Ushuaia (24 per cent) Puerto Madryn (19 per cent), and Puerto Deseado (24 per cent).

4. **Chartered fleets:** Under the 'charting' regime, established in 1994, Argentine companies could charter or hire foreign fleets to harvest and process squid, subject to government approval and the payment of a royalty. This regime encouraged the significant growth of squid landings. Jiggers (*poteros*) boats developed in Southeast Asia specialized in the squid catch. In 1999 there were 49 national-owned ships and 57 chartered ones in the squid catches.

5. The development of the **surimi industry** resulted in the increase in Southern blue whiting catches, primarily harvested by mid-water trawls. Industrial processing consists of the production of a homogeneous fish paste, which afterwards is used to make different varieties of fish products.

The Coastal fleet is a diversified one. Their landings are of wide variety of species using different fishing gear. Hake represents a very small proportion of total landings, less than 1 per cent, and may be considered as incidental landings. They integrate a cooperative which is in charge of the industrialization and commercialization of their products. For the rest of the fleet, as the following figure shows, the principal captures are by species in different types of boat.

FIGURE 9
Main fish species by fleet
(in percentage of total landings, 1999)

Ice Trawlers	Hake (<i>merluccius hubbsi</i>): between 60/65% to 85%
Processing ships	
Freezer fleet	Hake (<i>merluccius hubbsi</i>): between 55% and 81%
Longline (palangreros)	Patagonian Toothfish: 90%
Shrimp (tangoneros)	Shrimp (82%); hake (9%); squid 8%
Surimi	Southern blue whiting (56%); Hoki 42%
Jiggers (poteros)	Squid 100%

Source: INIDEP, SAGPyA.

Ice trawler ships are specialized in hake capture. INIDEP classified them in three groups, according to length:

- class I (length between 19 metres and 28 metres);
- class II (length between 28 and 39 metres);
- class III (length between 39 and 65 metres).

Ships of class III have the higher hake proportion in their fish landings, nearly 85 per cent. They do not have processing plants on board, and are connected with on land plants. This is the most vulnerable fleet in the present hake crises.

Freezer fleet: in 1999 freezer ships reached 36 per cent of total fish catches which means a significant increase in comparison with previous years. INIDEP has classified the fleet into the following groups:

- Group I: ships with lengths between 29 and 58 metres. These ships specialize in hake. They also fish squid and kingclip, which are species that accompany hake.
- Group II: ships with lengths between 59 and 83 metres.
- Group III: ships with lengths between 84 and 110 metres that specialize in hoki catches.

It is estimated that 80 per cent of total catches are processed on land. In addition, it is also estimated that about 50 per cent of the processing fleet catch is processed on board.

The freezer fleet is, by definition, a processing fleet. As can be seen in the following figures, hake is the main fish landing for trawlers and integrated fleets, mostly for trawlers with on-shore plants. Frozen headed and gutted hake are the principal processing products of these kinds of ships.

About 50 per cent of the vessels' total variable costs are fuel and maintenance. Fuel costs for vessels operating in Patagonia account for 10 to 15 per cent of the costs, and maintenance for another 15 per cent. Fuel costs are higher for the Mar del Plata boats because of their longer steaming time.

FIGURE 10
Processing fleet: on-board hake processing, 1997

<i>Processing fleet type</i>	<i>Hake as a % of total landing</i>	<i>Filleting as a % of total hake processing</i>	<i>H&G as % of total hake processing</i>
Trawlers with on-shore plants	81	39	61
Trawlers without on-shore plants	54	24	74
Integrated trawlers, Longline, shrimp, squid, with on-shore plants	71	28	68

Source: INIDEP estimations, 2000.

8.2 On-shore processing sub-sector

8.2.1 Processing activities

According to the National Industrial Fisheries Census of 1996, there were 240 active processing plants and 81 active cooperatives (processing and filleting of fresh and chilled seafood), mostly concentrated in Mar del Plata, Buenos Aires.

The industrialization process began on an important scale in the 1960s, in Mar del Plata. Later on, expansion took place during the 1970s and the early 1980s. Nowadays, processing and filleting plants of fresh or chilled fish and of freezing are the most important industrial activities.

FIGURE 11
Fishery processing plants

<i>Processing type</i>	<i>1982</i>		<i>1987</i>		<i>1996</i>	
	<i>Buenos Aires</i>	<i>Patagonia</i>	<i>Buenos Aires</i>	<i>Patagonia</i>	<i>Buenos Aires</i>	<i>Patagonia</i>
Processing and filleting of fresh or chilled finfish or shell fish	52	3	71	1	26	22
Freezing and cold storage	4	–	5	22	2	
Processing, filleting and freezing of finfish or shell fish	51	10	56	27	39	38
Salting	35	1	32	1	18	–
Canning	13	2	16	1	7	1
Fish meals and oils	8	2	3	2	5	1
Subtotal	163	18	185	334	97	62
Cooperatives	–	–	–	–	(70)	(11)
Total	181		219		240	

Source: Censo Nacional Pesquero, 1996 and prior censuses.⁷²

⁷² There is strong resistance to and distrust of official data such as the information presented here. Many sources indicate that, given the precarious hiring situation, real employment in processing plants is grossly under-reported. Therefore, it is indicated that if the under-reporting factor is compounded, some of the larger firms with informal hiring practices can have at a time between 500 and 800 workers.

Most of the plants are small or medium sized. In terms of employment, 20 per cent of the total have less than five persons; 55 per cent of the total have less than 25 persons, 37 per cent of the plants have between 25 and 100 persons.

The number of plants in Buenos Aires decreased by 40 per cent between 1987 and 1996; in contrast, plants in Patagonia increased by 77 per cent. Nevertheless, 59 per cent of plants and 88 per cent of cooperatives are located in Buenos Aires. Most of the growth was experienced in the processing, filleting and freezing activities.

INIDEP presents additional results of the 1996 Census for Mar del Plata. In this location, firms belong to national owners, with the exception of two processing, filleting and freezing of finfish or shellfish firms, which are 100 per cent foreign capital. Investments in infrastructure and out-lay of plants were made principally in 1995 and 1996, followed by investments in processing and freezing equipment.

Large processing, filleting and freezing plants have their own ships; the rest of the plants are supplied by independent vessels or by other plants. Plants located in Patagonia had received promotional benefits through national and regional economic policy.

8.2.2 Processing costs

In the hake processing plants, raw material for filleting accounts for 60 to 70 per cent of the costs, and labour for 10 to 15 per cent. The rest of the costs are mainly ice and packaging.

Seafood prices for Argentine exports (mainly hake and squid) are formed in international markets and influenced by scarcity in other fishing areas and in the availability of other fishing grounds. Argentine exports are of the commodity type and most exports are frozen fish blocks, frozen fillets, H&G and minced products.

8.3 Towards a typology of agents in the fishery system

8.3.1 Typology

Several typologies of agents operating in the fishery industry are proposed in different studies, but none of them, so far, has estimated the relative economic importance of each type of agent. The lack of statistical information, the sector's complexity, and the dynamic restructuring process are the main reasons that explain these results.

Apart from different degrees and forms of integration between the primary and the industrial sub-sectors, different sizes of ships and fishing gear, and different degrees of fishing specialization, there are also different channels of distribution and different productive and commercial chains regarding species, degree of industrialization and specific destination markets. Taking into account the integration forms, and the characteristics of vessels, the following typology is proposed:

- Integrated ice trawler fleets, with on-shore plants;
- Independent ice trawler firms;
- Integrated freezer vessels with on-shore plants;

- Independent freezer vessels without on-shore plants;
- Integrated ice trawler and freezer vessels with on-shore plants (ice trawler intensive);
- Independent ice trawler and freezer vessels with on-shore plants (freezer intensive);
- Jiggers with plants;
- Jiggers without plants;
- Charters;
- Longliners;
- Surimi ships;
- Longliners and surimi ships;
- Shrimps ships with or without plants;
- Factory fleets with incidental hake catches.

It has been pointed out that even though this is a very comprehensive typology, it is not enough to fully understand the agents' dynamics and interest group networks in the sector. In the first place, it is important to identify the economic groups operating in this industry—which are conformed by different firms, integrated or not, which own different kinds of fleets. Another important distinction is capital ownership: the most important foreign capital in the sector is from Spain, but there is also Japanese capital (in surimi), South Korean capital (in squid), Norwegian capital (in squid and longliners), plus capital from the US and from China.

In the case of hake catches, other studies propose an additional classification of the freezer fleet, consisting of the number of years that ships are fishing in the South Atlantic waters. The following tables present partial information about the economic strength of the different kinds of firms.

FIGURE 12

Salaries and other variable costs for fishing ships

<i>Year/cost</i>	<i>Coastal and ice trawler fleet</i>	<i>Freezer fleet (hake capture)</i>
1997		
Salaries	68.1	65.2
Other inputs	80.2	100.5
1998		
Salaries	60.0	54.0
Other inputs	70.0	82.6
1999		
Salaries	50.0	41.2
Other inputs	58.5	63.6

Source: INIDEP, preliminary data, May 2000

FIGURE 13
Economic groups—employment in on-store plants, 1996

<i>Economic group</i>	<i>Employment</i>
Ice Trawler/Coastal ship, with plant	2192
Integrated intensive ice trawler (with plants and processing ships),	2150
TOTAL ICE TRAWLER	4342
Freezer with plant	289
Freezer with cold storage	200
Integrated intensive freezer (with plants and processing ships),	1208
TOTAL FREEZER	1697
TOTAL PLANTS WITHOUT SHIP	744
TOTAL ON-SHORE EMPLOYMENT OF ECONOMIC GROUPS	6783

Source: INIDEP, provisional figures, May 2000

INIDEP provisional data on the salaries participation to total costs was of 40 per cent for coastal and ice trawler ships, and 35 per cent for the freezer fleet.

Contradictory interests in the hake crisis

At present, in the middle of the hake crisis, owners of freezer fleets and of processing fleets are confronted. The first consider that the strong growth in processing fleets' hake catches are the origin of the resource over-exploitation, and the under-employment in on-land plants. Frozen fleet firms, on the contrary, consider themselves to be the drivers of technological change, and the most efficient ones, so they can face consumer demands for higher quality in the export markets.

This confrontation also has a) geographical aspects - Buenos Aires versus Patagonia; b) origin of firms aspects - national versus foreign firms; c) degree of integration of firms aspects - with or without on-shore plants.

Conflicts and competition among 'users' of these scarce resources are important. Both segments are affected by the present crisis, but the impacts are not similar, as presented above.

The hake crises will also affect other species, following the expected reorientation of landings to prevent losses. Financial capacity and credit access are key variables in the ongoing restructuring process, together with the ownership of a diversified and integrated fleet.

8.4 Labour and private organizations

8.4.1 Labour organizations

Labour organizations include different trade unions as well as other types of associations for on-board and on-land workers. Among the on-board labour organizations and unions, several associations can be found for sea workers, for navy personnel, as well as for shipmasters. Among the unions, there are several that agglutinate food industry workers and fisheries' workers trade organizations. As in many labour sectors in Argentina, there is

a high dispersion of labour organizations, given their historic form of organizing by branch and sub-types of work.

Nevertheless, although trade unions and labour-related organizations do have a high degree of representation for on-board personnel, this is not the case for on-shore workers. Given the high level of informality in the so-called labour cooperatives, cooperative workers are not unionized nor do they have formal employee status. This precarious status (i.e. non-unionized employment) affects 34 per cent of on-shore employees.

8.4.2 Business sector organizations

Business sector organizations are differentiated according to the type of vessel and working modalities, as well as geographical location. Some business associations began as alliances defined from where the capital originated from, for example joint ventures or national capital. A high dispersion of business sector organizations can be seen, as expected, but only to a certain degree, due to the multivariied exploitation of the resource that is being utilized.

Some business sectors' associations agglutinate ship owners that operate in the high seas, others owners of freezing fleets, while yet others agglomerate ship owners of smaller coastal fleets (the latter tend to be associated exclusively by the harbour where their ships operate from). Furthermore, additional ones gather exclusively along a geographic characteristic, which implies a diversification of industries or fleets they represent.

It has also been pointed out that new associations have upsurged in recent times exclusively as agglutinations of different economic groups, and these organizations have scarce representation in the true sense of a business association. Furthermore they cannot be counterparts in labour negotiations as authentic business associations do (see Georgeadis, et. al., 1998).

There are also business associations of fish processing firms and of canning enterprises. Given the particular situation that cooperatives have in relation to the fish processing industry, at times these also fulfil the role of quasi-labour organizations.

Over thirty business organizations have been identified. This diversity also reflects excisions and changing factors in the fisheries business sector. Although at some point several business associations have been federated, currently there is no second-tier business coalition that would significantly group different chambers

8.4.3 Other civil society organizations

As can be expected from such an activity, there are a multiple number of organizations that are neither labour nor business groups, yet deal with the fisheries sector. Among these are several professional organizations, private research centres, and academic groups who take up the subject, either directly or indirectly.

Environmental organizations also deal with the subject, though most of them from a preservationist or conservationist viewpoint. There are very few environmental organizations or institutions with an environmental outlook that embraces the subject from a sustainable development perspective. Some of these have intertwined alliances with

stakeholders from other groups, given the relatively low weight that environmental organizations have in Argentine policy steering.

Conclusions

The extremely high desegregation, especially in the business sector but also in labour organizations, has implied that claims regarding fisheries problems have been highly desegregated. The number of actors and their conflicting claims over what can be perceived as a single resource, have been conducive to high conflict situations. Furthermore, this piecemeal composition of all sectors that compose civil society have implied a difficult and at times contradictory negotiating strategy from different government sources, further aggravating the search for durable solutions.

9. VALUATION OF TRADE LIBERALIZATION

9.1 Environmental impact

9.1.1 Fish stock reduction and impact on fishing effort

The increasing over-capture and pressure on just a few species has caused significant impact on strictly defined environmental variables. Research has indicated that there are six commercially utilized species where the fishing stock is endangered.⁷³ Three essential indicators will be examined for these species in order to be able to determine environmental impacts: 1) total biomass estimations, 2) reproductive biomass estimations, 3) fishing effort.⁷⁴ Not all indicators are readily available for all species. Although the indicators used generally fall along the above-mentioned lines, slightly different evaluations are made for different species (for example, fishing effort is measured by captured metric tons by hour of trawl or simply by hours). Therefore, impact indicators for the different species can vary slightly from resource type to resource type.⁷⁵

Merluccius hubbsi

This is currently the species most at risk of collapse. The species has three niches within the ocean platform, one south of parallel 41° S and one north, as well as a third niche within the Patagonian Gulf San Matias. For this work, the two major niches (north and south of 41° S) will be dealt with.

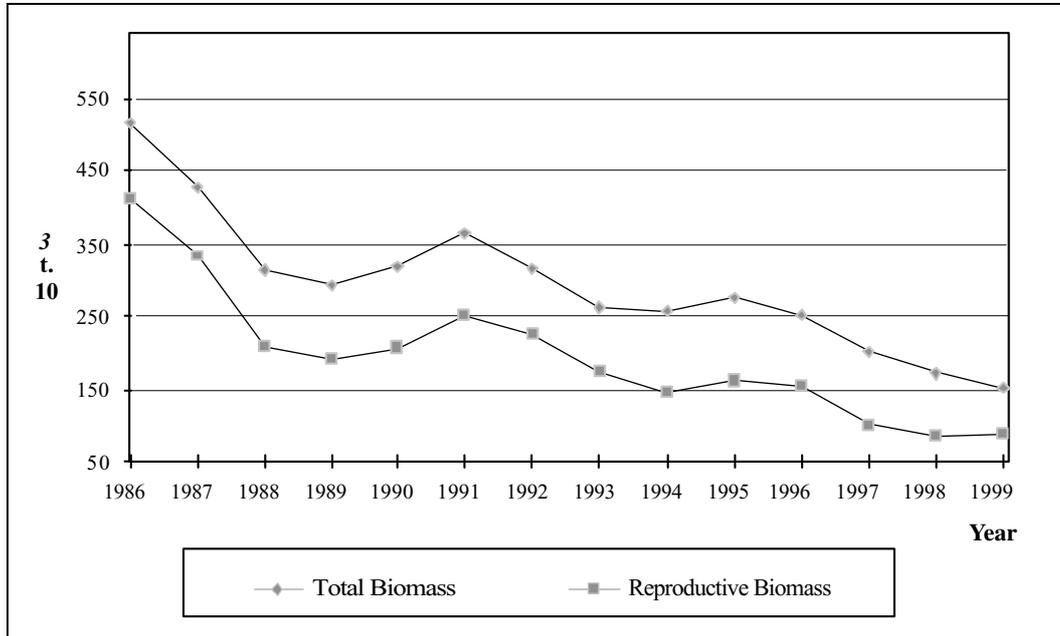
The average size of captured hake has decreased. In 1986, the mean size was 44 cm and 40 cm in 1998. Other evidence is biomass assessments. The hake population to the north of parallel 41° S is clearly excessively exploited, as indicated by biomass estimates, indicated in the graph below (Figure 14).

⁷³ These fish species are: Merluz/Argentine hake (*Merluccius hubbsi*); Polaca/Southern blue whiting (*Micromesistius australis*); Corvina rubia/Croaker or White Croaker (*Micropogonias furnieri*); Pescadilla de red/Striped weakfish (*Cynoscion guatucupa*); Besugo/Red porgy (*Pagrus pagrus*); Merluza negra/Patagonian Toothfish (*Dissostichus eleginoides*); and Merluza austral/Southern Hake (*Merluccius australis*). Source: Casal J. L. y Prenski L. B. (Editors) : 2000. *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP . Mar del Plata, Argentina

⁷⁴ Fishing effort measures are gages that attest to the effectiveness of fishing, and—together with other indicators such as biomass estimation—can act as an index to species abundance. They are recorded in local literature as captured tons per hour of trawl (*Captura por Unidad de Esfuerzo*—CPUE) or simply in hours. When examined over time, this indicator can grant impact evidence.

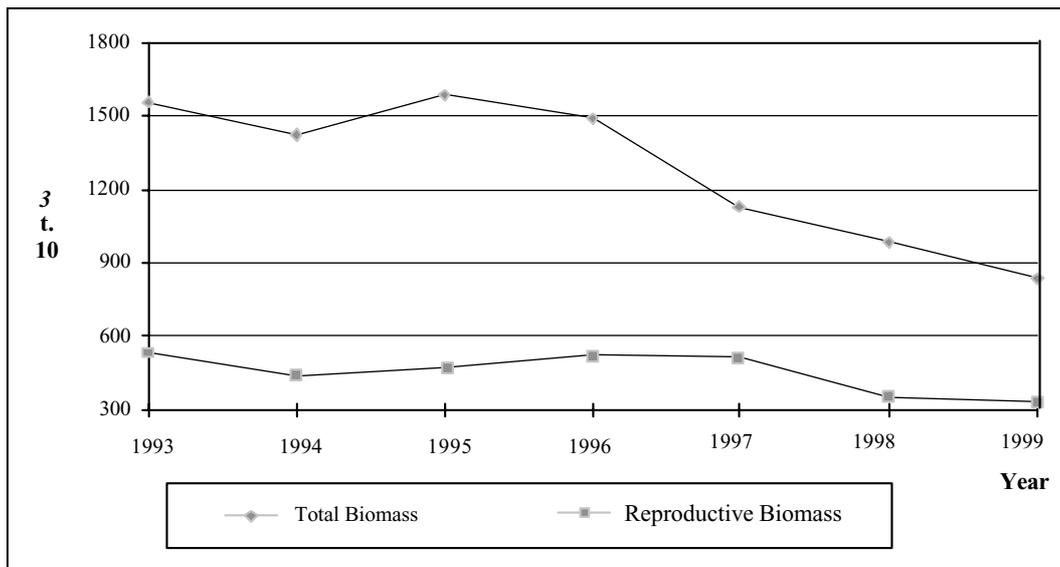
⁷⁵ Most of the section on fish stock reduction, and relevant classifications regarding stock status, have been extracted from the compilation carried out by Casal J. L. y Prenski L. B. (Editors) : 2000. *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP. Mar del Plata, Argentina, unless otherwise noted.

FIGURE 14
**Total and Reproductive Biomass for *Merluccius hubbsi* north of 41° S
 1986-1999**



Source: Casal J.L. y Prenski L.B. (Editors), *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP, Mar del Plata, Argentina, 2000.

FIGURE 15
**Total and Reproductive Biomass for *Merluccius hubbsi* north of 41° S
 1993-1999**



Source: Casal J.L. y Prenski L.B. (Editors), *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP, Mar del Plata, Argentina, 2000.

As can be seen in the graph (Figure 14), biomass (total and reproductive) is at an all time low, following a downward decline. The decline of biomass for the period 1997 to 1998 has been calculated, and it is indicated that total biomass north of parallel 41° S for *merluccius hubbsi* has experienced a 28 per cent drop just for that one-year period.

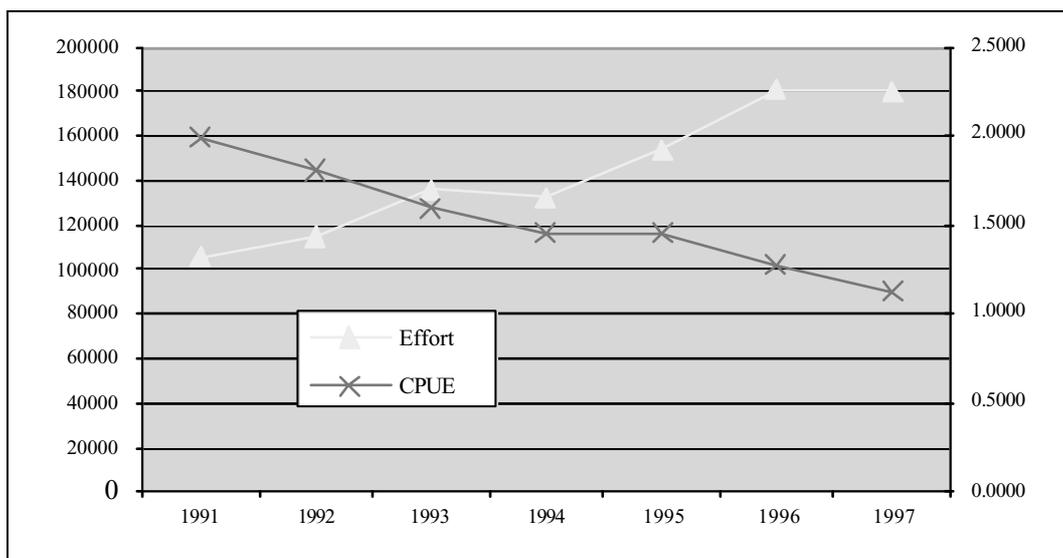
Although total biomass decline is not as high in the other major zone where *Merluccius hubbsi* is found (south of parallel 41° S), as in the graph above (Figure 15), there are still clear indications of overexploitation.

Therefore, for this species, it can be concluded that total biomass and reproductive biomass have decreased sharply. From the latter, it can be determined that reproduction capacity has declined, endangering the future recuperation of the resource.

Fishing effort analysis concurs with biomass assessments. In the period 1986-1997 was a change in fishing effort measured in captures per unit of effort, which rose 68 per cent while the total standard effort increased 2.6 per cent in this period. Furthermore, when analysing by fleet, other drastic fishing effort change can be perceived. This can be illustrated by Figure 16, where fishing effort for ice-trawl vessels is mapped.

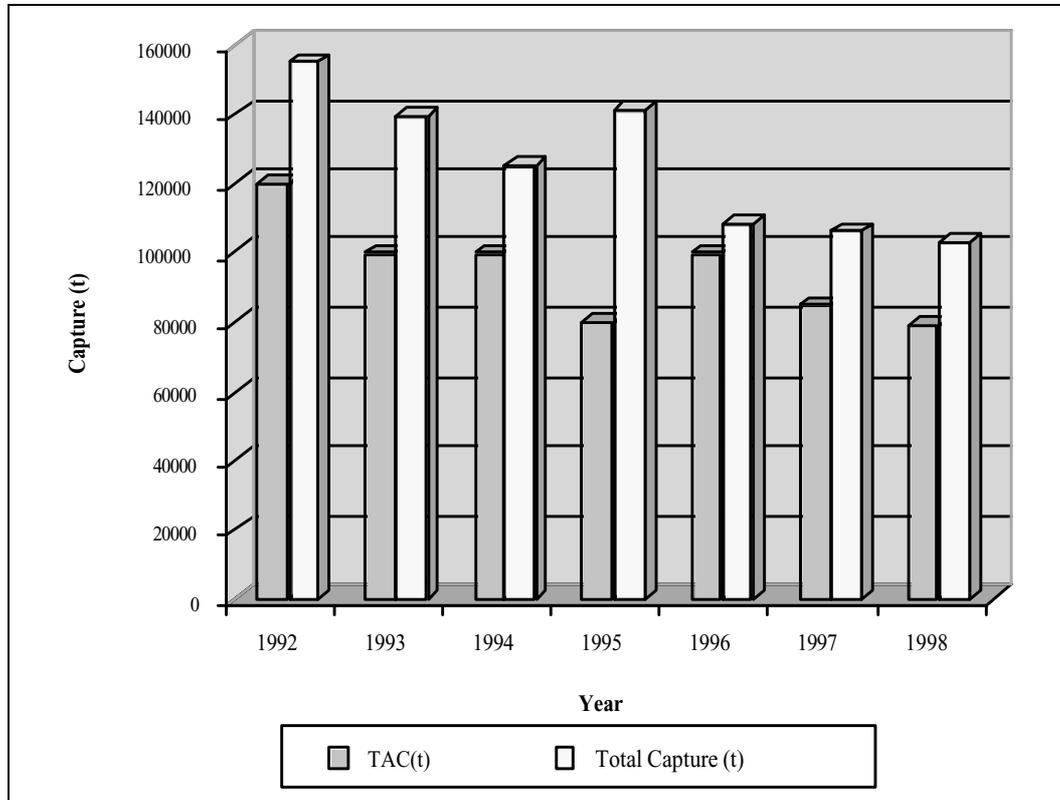
Notwithstanding the discrepancies arising out of different reportings of the catch of this species, peak periods of capture have concluded in over-fishing of the resource.

FIGURE 16
Fishing effort of ice-trawl fleet for *Merluccius hubbsi*, 1991-1997



Source: SAGPyA as shown in Godelman et. al., 1999.

FIGURE 17
**Total allowable catch and actual total capture for Southern blue whiting,
 1992-1998**



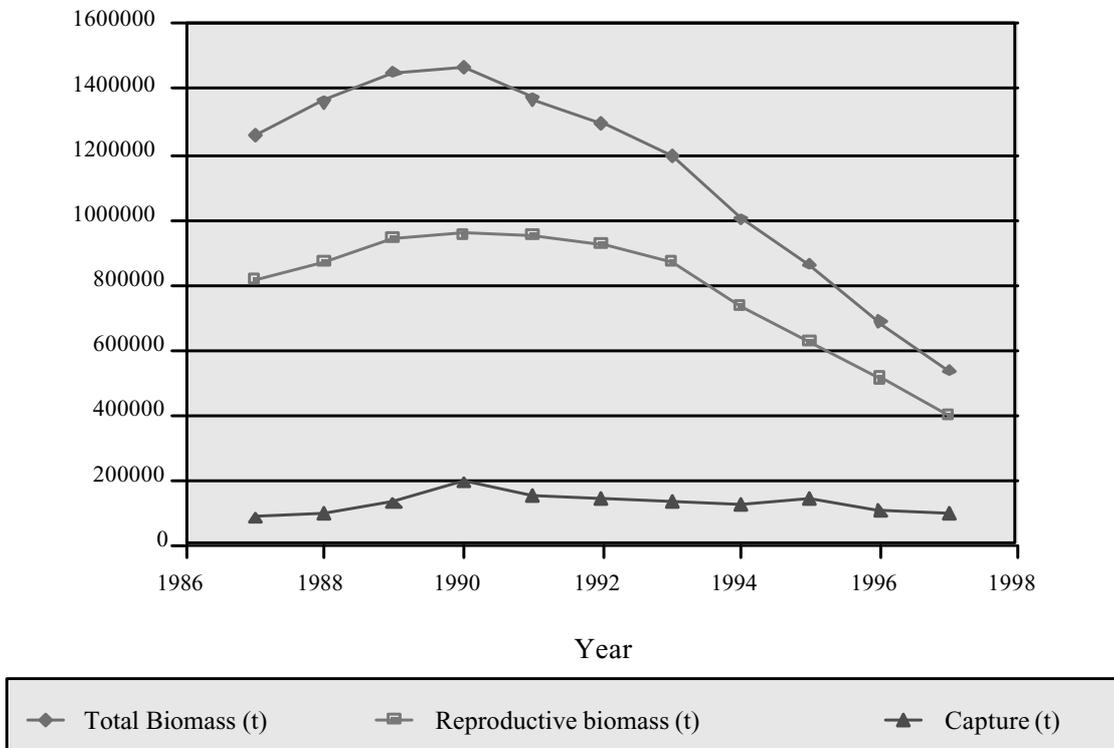
Source: Casal J. L. y Prenski L. B. (Editors), *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP. Mar del Plata, Argentina, 2000.

First, it is indicated by INIDEP that for the last decade, catch has greatly exceeded the TAC, as is illustrated by the graph below. Furthermore, the capture over the TAC has impacted greatly, since it had an immense incidence on biomass due to this species' biological aspects, for example its longevity and life cycle.⁷⁶

Biomass indicators (total and reproductive) coincide with fishing effort analysis and other studies (such as diminishing rates of juveniles in capture, distribution, etc.), which indicates that exploitation rates have put the resource at risk. See Figure 18 for biomass indicators.

⁷⁶ Although scientific estimates vary greatly with regard to this species' life cycle, it is a long-lived species without any doubt. Some estimates of maximum age are of 30 years, while others indicate that this species can live up to 23 years. Currently, after intensive fishing has taken place, the maximum reported longevity is of 21 years. (Casal J. L. y Prenski L. B. (Editors) : 2000. *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP . Mar del Plata, Argentina).

FIGURE 18
**Biomass estimations and capture for Southern blue whiting,
 1986-1998**



Source: Casal J. L. y Prenski L. B. (Editors), *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP. Mar del Plata, Argentina, 2000.

As this figure indicates, in relation to the TAC data presented earlier, where the allowable capture is greatly exceeded by the real harvest, although capture has been steady, biomass is falling abruptly.

Croaker or White croaker / Corvina rubia (Micropogonias furnieri)

Up until 1992, there was practically no intensive use of this particular resource. In that year, exports to Asian countries started, reports of abundance were established, and seasonality of catch⁷⁷ led to a significant increase in capture (367 per cent from 1992 to 1995). The result has been that fishing effort was 60 per cent greater in 1996 than in 1986, when measured by hour. Acute changes in effort are also accounted for when measured by capture per unit of effort (CPUE). Although some control measures have been implemented in 1998, assessments have indicated that there has been no substantial recuperation of this species, and accentuates the critical state of this resource.

⁷⁷ This species is caught in the southern hemisphere's winter, a period of time when other species are generally not harvested.

FIGURE 19
Fishing effort measures per units for White croaker
CPUE (t/mn²)

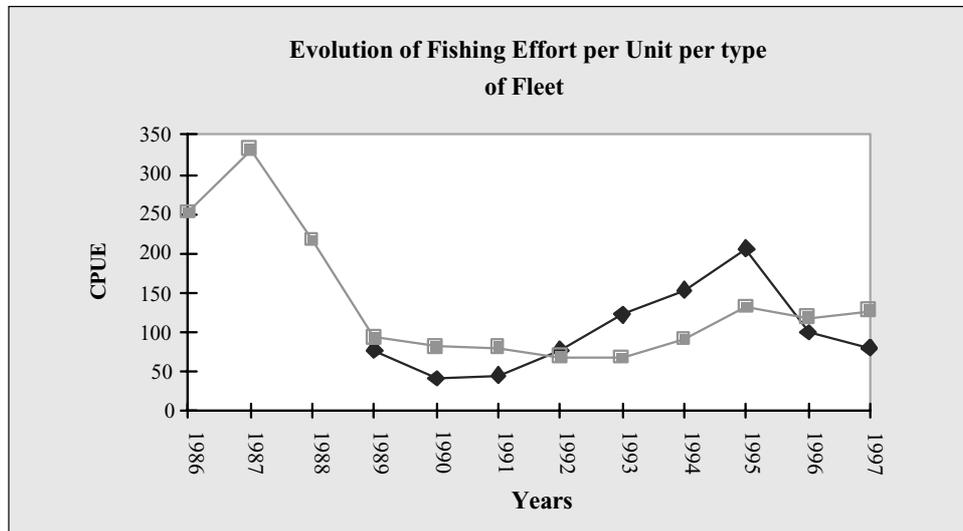
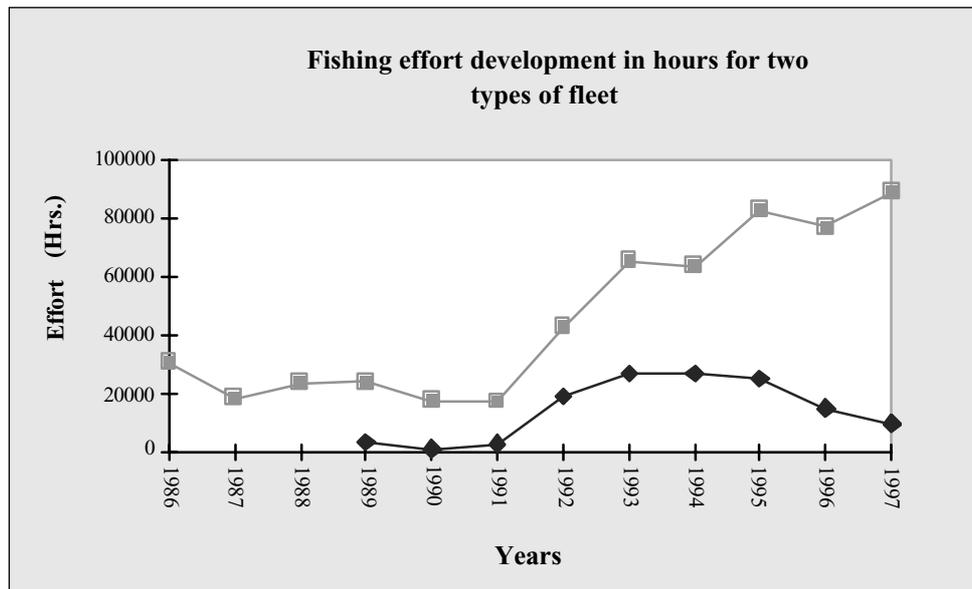


FIGURE 20
Fishing effort in hours for White Croaker

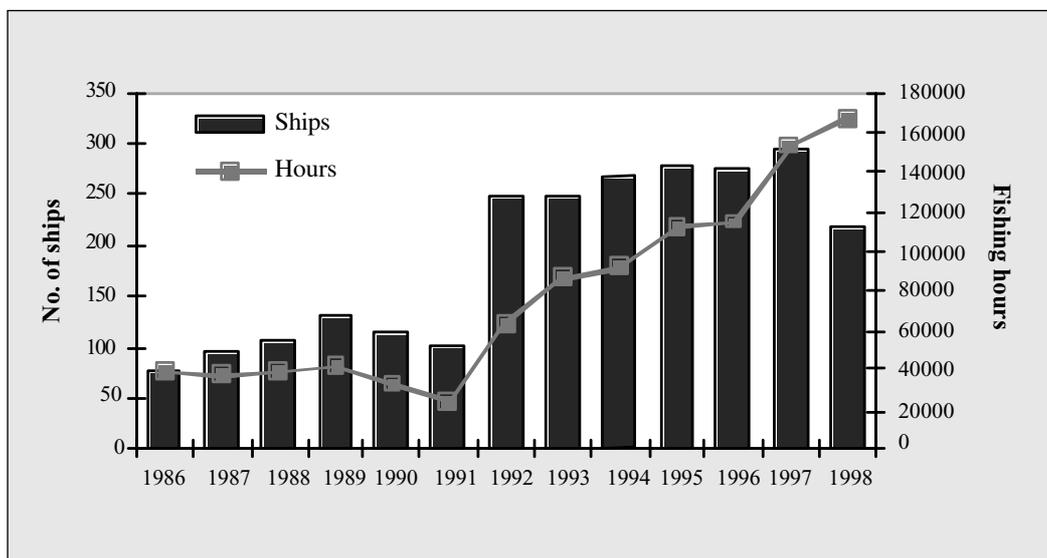


Source: Casal J. L. y Prenski L. B. (Editors), *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP. Mar del Plata, Argentina, 2000.

Pescadilla de red / Striped weakfish (Cynoscion guatucupa)

This is another species with negligible capture until the early 1990s. Captures of 4000 metric tons in the 1970s and 1980s grew to a record 24,130 metric tons in 1997. Accompanying this expansion, the number of vessels grew from 75 to 218 from 1986 to 1998. Fishing effort measured in hours increases greatly in this period, as can be seen in the graph below.

FIGURE 21
Number of ships and fishing effort in hours, 1986-1998



Source: Casal J. L. y Prenski L. B. (Editors), *Diagnóstico de los Recursos Pesqueros de la República Argentina*, INIDEP. Mar del Plata, Argentina, 2000.

Other species

Other fish have also been categorized as at risk, yet there are no genuine indicators as to the extent of risk. The other three species catalogued for which there are some indicators of impact are described below.

Red porgy / Besugo (Pagrus pagrus)

This type of finfish has experienced an intense drop in capture, yet very little is known about its condition. There are, in addition to the drop in harvest, some indicators given that the size of captured fish is substantially smaller at this time than in previous years, yet there is high uncertainty as to biomass calculations and fishing effort.

Patagonian toothfish / Merluza negra (Dissostichus eleginoides)

Biomass calculations for Patagonian toothfish in the late 1970s in the region south of parallel 46° S were about 13,444 metric tons, yet the estimate of biomass for 1999 has dropped to 4,650 metric tons. The biomass estimates to the north of parallel 46° S shows no significant impact. Nevertheless, it has been determined that data on this species is also scarce and deficient. Slow growth factors as well as intensified exploitation without genuine knowledge as to the status of this species warrant its classification as a species whose exploitation has to be observed.

Southern Hake / Merluza austral (Merluccius australis)

Although this is one of the many species in the Argentine platform where there is little biological knowledge, it has been classified as an over-exploited species in several recent evaluations due to several partial indicators.

9.2 Ecosystem impact of fisheries: other indicators

Although there is no sizeable comprehensive research on the ecological impact of fisheries from an ecosystem perspective, there are several indications that could be used to establish impact. Some are based on deduction from similar ecosystems; others are based on descriptive data.

The first matter that arises out of the literature is the impact of fisheries on other marine organisms. For instance, the FAO reports that Patagonian toothfish fishing (using long-line gear) is one of the principal fisheries⁷⁸ in which incidental catch of seabirds, are known to take place. In addition, although the real extent of this occurrence is not quantified, it is of a magnitude that has called for action from different national, regional and supranational entities. For example, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) adopted mitigating actions in 1992 to reduce incidental catch of seabirds, and Argentina is one of the countries party to this accord.⁷⁹

Other indications are the impact on the coastal system and coastal cities with a large amount of fisheries activities. Increased environmental impact of fisheries and adjoining activities (such as increased harbour transit, impact of processing plants, and so on) are repeatedly reported. Yet they are not sufficiently analysed or quantified to date.

Due to the lack of analysis on the more general effects of fishing on ecosystems or of interfaces between different species, ecological assumptions based on similar ecosystems are used to try to ascertain the extent of impact of commercial fishing. For example, it has been reported that fisheries remove about 35 per cent of the primary productivity of marine

⁷⁸ See FAO "The International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries".

⁷⁹ Reports of seabird incidental catch have indicated that this occurs with several species such as albatross, cormorants, penguins, petrels, seagulls and terns. These species inhabit Patagonia mainly. There are also copious reports of mammals' by-catch and mortality due to fishing practices and gear used, some of which are porpoises, dolphins and sea lions, among others. These are also mammal species mostly present in Patagonian ecosystems.

ecosystems of non-tropical shelves.⁸⁰ This can usher in notable modifications of marine ecosystems and their productivity. Secondary productivity can also be greatly reduced or altered by over-fishing, as has been generally documented in literature on the impact of fisheries. The links between these modifications can be varied, in particular affecting trophic chains. Again, although the primary research for Argentine fisheries, following an ecosystem approach, is lacking, there have been several indications (such as a biomass increase of species preyed upon by hake) that the near-collapse of *Merluccius hubbsi* fisheries and the drastic reduction of its stock is the explanation behind a modification in ecological community structure.⁸¹

Other foreseen impacts are the potential ‘domino’ effects that changes in resources can produce.⁸² For example, the stock reduction of *Merluccius hubbsi* has led to the elevated and rapid exploitation of other resources (such as the *Macruronous magellanicus*). Moving fishing capacity to other species in such a way that there is inadequate reproduction potential can surely entail repeated sequential over-exploitation of different species. Some evidence of this sort is already being faced in Argentine fisheries, and ecological impact is beginning to be observed, especially concerning impact on biodiversity, reproductive output, spawning, and other such ecological dynamics.

In sum, several strong indicators suggest that there are several ecological impacts when fisheries are analysed as a system, and not only in a species-by-species basis. A more thorough understanding of the impact of fisheries exploitation on biodiversity, fishing community structure as well as habitat alterations is needed in order to be able to manage fisheries as a whole and not on a fragmentary basis.

9.3 Social analysis of the fisheries sector in Argentina

Every sustainable development assessment should incorporate a social analysis given the inter-relationship between natural resources and the productive sector. The following section will deal with an evaluation of the impact that fisheries development has had on labour opportunities, examining in particular the possible impact that a collapse of hake fisheries could have on labour issues. Social conflict surrounding fisheries in Argentina will also be explored.

9.3.1 Impacts of the hake crisis and industry restructuring on employment

As has been described in other sections of this report, employment in the harvesting and processing sub-sectors of the fisheries system is about 24,000 people, with 50 per cent of the total in each sub-sector. Contrary to public perception and disseminated notions, there are indications that the increase in catch did not (in an overall analysis) lead to higher rates of employment in all areas. It has been indicated that in the period of growth in the fisheries sector in Argentina, 11 per cent of fishery-related jobs were lost in the period

⁸⁰ As cited in Schonberger and Agar “Argentina: Towards Rights-Based Fisheries Management”, the World Bank, December 1999.

⁸¹ This is the explanation given for the presumed increase in species such as the “anchoita” or anchovy (*Engraulis anchoita*) as well as other marine resources that hake preys upon.

⁸² This is the explanation given for the presumed increase in species such as the “anchoita” or anchovy (*Engraulis anchoita*) as well as other marine resources that hake preys upon.

1987-1996. This greatly affected the city of Mar del Plata, where employment fell 25 per cent in that same period.

In order to evaluate the possible impact of the collapse of hake fisheries on employment (and therefore welfare), or reduction in catch mandated by the drop in the resource itself, the following breakdown basically centres on that area of fisheries. Estimations concerning employment in the hake industry are scarce and not homogeneous, yet it can be stated that approximately 9,800 workers depend on hake fishery with the following heterogeneous distribution (Figure 22).

FIGURE 22

Employment by location in hake fishery

<i>Location</i>	<i>Number and share of total workers</i>	
Mar del Plata	5965	61%
on-land	3990	41%
on-board	1975	20%
Patagonia	3822	39%
on-land	966	9%
on-board	2856	30%
Total	9787	100%

Source: Novic, M. et.al., 1999.

Males represent 81 per cent of the total workforce, yet women make up 35 per cent of the global on-shore workforce. However, while in Mar del Plata, women make up 24 per cent of the workforce, in Patagonia 81 per cent of on-shore labourers are female. This can be explained by the fact that most new jobs in the fisheries sector were created in Patagonia, and given that women tend to enter newly created job markets. For this region, a gender-differentiated impact can be foreseen if catch is substantially reduced. Another issue that has to be factored in is that from 30 to 44 per cent of female labourers in the fisheries sector are heads of household or primary economic support for their families.

On-shore workers are considerably more important in Mar del Plata, where cooperative workers are concentrated. Cooperative arrangements represent nearly 30 per cent of the total in-shore employment. These workers are not included in job security systems, do not have safety net provisions, and most of them are under-employed. In terms of earnings, 59 per cent of the workforce earns less than US\$ 400 per month, a great proportion located in Mar del Plata.

Even though labour in fisheries requires a highly trained labour force, education levels are low: almost 93 per cent of the on-shore population did not finish high school and nearly 50 per cent did not finish primary school. Figures for the on-board workforce are 72 per cent and 30 per cent respectively.

When analysing the social impacts of the hake crises, it is estimated that the number of workers directly involved in the hake catch and processing activities is about 8,200 people. Differences between both estimations are to be found in figures concerning Patagonia employment, which are considerably smaller in this study, only 2,400 workers.

The following two scenarios of probable employment impacts can be presented following the hake crisis and restructuring of the industry (see Novick et al., op. cit.).

The hypothesis of simplified minimum and maximum impacts derive from the presumption that some types of rigorous measures and imposition of quotas would be implemented to reduce catch and prevent over-fishing and eventual collapse. The minimum impact hypothesis presents an impact on 70 per cent of hake-related on-shore employment and 65 per cent of hake-related on-board employment. The maximum impact scenario presents an impact of 100 per cent on-shore and 80 per cent on-board hake-related employment. This and other numbers of social impact scenarios are listed.

Scenario I: Minimum impact:

On shore impacts

Hake	70%
Other species	15%

On board impacts

Hake	65%
Other species	0%

Scenario II: Maximum impact:

On shore impacts

Hake	100%
Other species	20%

On board impacts

Hake	0%
Other species	20%

Each scenario would, therefore, have different social impacts. These estimations point out that the number of workers directly concerned with the implementation of short term reduction in hake catch, that will lose their job are, depending on each scenario, between 7,220 and 1,023, 65 per cent of them located in Buenos Aires, 65 per cent of the total corresponding to on-land workers.

Regarding on-land workers, both formal and cooperative workers will be extensively impacted by reductions in the TAC, being the cooperative segment (about 3,500 to 4,000 workers) the most affected being the more under employed, and the ones with more difficulties in finding a new job, because of their age.

Within on-board workers, those who work on inshore fleets will be moderately impacted since hake constitutes about 42 per cent of their landings and they are not a specialized fleet. On the contrary, the ice-trawl fleet will be heavily impacted by smaller allowed catches, since hake represents 70 per cent of their landings. Factory and freezer fleets will be also impacted, but to a lesser degree, since hake constituted only 30 per cent of their landings and most workers are protected under collective agreements.

The above figures concern workers directly engaged in hake production. There are, of course, a number of activities indirectly related, mainly in the small urban locations that were organized around fish production. Among them, diminishing job opportunities in port activities, warehouses, processing industries, transport, maintenance shipyards, and services are expected.

Even if it is not possible to have an estimation of the total social impact of reduction in hake catches, it has been pointed out that for 42 per cent of the families, workers in the fisheries sector are the only income earners, which implies that, considering an average of four members in each family, about 17,000 people are totally dependent on those earnings. A preliminary estimation of the total social impact of the hake crisis indicates that more than 50,000 people will be affected.

9.3.2 Social perception and conflict

Social conflict is an indicator of discord over a single resource with multiple and conflictive uses. It is impossible to quantify, yet can be quite visible and highly hostile. For this study, archives from the media for the period 1996 - 2000 were analysed, and the results are quite indicative of conflict and public perception of the strife. For the period 1996 – 1998, almost no reporting on fisheries took place in major national media, except for milestones (as for example approvals of legislation, etc.). This is also significant, by attesting that the fisheries sector was not important in public perception in Argentina, and that this country did not consider itself a country with substantial fisheries. The latter of course was inconsistent with the rate of growth and export value of fisheries products, but accurately reflecting the perception of what traditional exports were for this country.

In late 1998, when the first biological stops took place, conflicts arising out of this situation were than covered widely by the media. The coverage greatly increased in late 1999 when dispute between and among different interest groups and different geographic regions begin to take place. During the year 2000 coverage continues, with further analysis, but mostly dealing with the conflictive situation.

Several conflictive situations and social disruptions have been fully documented by all types of public information and dissemination in the media. Conflict has been violent, damage to property has repeatedly been registered, and life-threatening situations have been exposed. Real or perceived conflict follows divisory lines: between towns that had fishing as one of its traditional activities and cities that have recently entered into the activity; between ice trawler fleets and processing fleets, and between business of national capital versus enterprises with foreign capital.

9.4 Cost-benefit analysis⁸³

Cost-benefit analysis (CBA) is a set of techniques used as a tool for making decisions about proposed investment projects and, in a general sense, to compare the advantages and disadvantages of alternative policies to be adopted. In the case of the Argentine fisheries sector, it could be argued that the exercise is almost trivial: practically any alternative

⁸³ This section follows the methodology presented in Villalobos, Ruy de (1999) Notes on the valuation of renewable natural resources. Mimeo.

control and management policy would have been better than the set of policies applied during the last ten years. The present critical situation, especially for the hake biomass (but relevant for other resources), is a result of this mismanagement process.

For the future, the fisheries crisis imposes the urgent adoption of better sustainable management policies. Present Fisheries Law provides an acceptable legal and regulatory framework for improving the effective control and management of the sector activities.

However, there is no clear definition of alternative policy-packages that might be adopted for the operation of future control and management of sustainable fisheries. Therefore, there is no room for a meaningful CBA on future alternative policies for the sector. Hence, the type of analysis undertaken under this section would be better named as the identification and quantification of economic costs and benefits of the recent fisheries sector evolution and policies in Argentina.

This exercise will be undertaken under two basic scenarios: (i) the factual scenario which implies the identification and quantification of actual benefits and costs of the recent policies and evolution of the sector, and (ii) the 'optimum-policies' scenario which would identify and quantify the costs and benefits of a sustainable fisheries policy. The comparison of the net benefits of both scenarios would clearly show the costs of adopting the wrong policies for fisheries control and management.

The CBA will be applied exclusively to the case of hake catching. Although it could be argued that recent policies also affected other species, the higher risk of collapse of the resource is concentrated in the hake biomass. Furthermore, hake represents a historically high proportion of fisheries resource traded, and is consequently the species most studied from several perspectives. Nevertheless, the results of the exercise will also provide valuable lessons to be applied to other species.

9.4.1 The identification of costs and benefits

Once a given impact in the society is classified as a cost or a benefit, a basic question is implicitly posed, i.e. for whom? Actually, from an economic point of view, CBA is undertaken assuming that there is a social function of utility which is affected positively (i.e. benefits) and/or negatively (i.e. costs) according to the different identified impacts of a given project and/or policy.

In this case, the 'society' could be defined as the Argentine economy, but this definition could conceivably be expanded to more broad definitions of 'society', given the fact that many fishery resources (as well as many other natural resources) do not have finite explanations regarding ownership and ownership rights. The distinction is not trivial. In fact, it is possible to find that some benefits for a given country are, in fact, costs for another nation or even the whole world.

In addition, the estimate of benefits and costs is usually done as aggregate economic flows while there is still the question of the different social and economic groups that are differently affected by benefits and costs. For example, for businesses, the salaries are costs but for the workers, the salaries are benefits. In this exercise, a matrix of beneficiaries will be estimated in order to show the most relevant impacts on the different categories of economic agents and social groups.

9.4.2 The positive impacts of sectoral policies and benefits estimate

As presented above, the main positive economic impacts of the sectoral policies can be listed as follows:

- a) increase in fisheries catches (production);
- b) increase in exports;
- c) increase in employment;
- d) improvement and growth of the fisheries fleet;
- e) technological innovation in the sector;
- f) increased research facilities and skills;
- g) opening of new markets and trade relations;
- h) increase in public income;
- i) regional infrastructure investments (ports, other infrastructure, new firms, etc.).

From the point of view of CBA, the main benefits are supposed to be the net increases in value added for the economy, assuming that labour marginal productivity is nil (i.e. high unemployment rate). Sectoral value added is equal to gross production value less operative costs.

Therefore, this economic flow derives from the positive impacts above listed, with the possible exception of (e) and (g). The net value added for the economy should correspond to the fisheries' production and its related sectors (i.e. construction, capital goods production, etc.),⁸⁴ but, for the sake of simplification, only direct fisheries sector activities will be considered in this exercise. Based upon different sources of information, the average price of hake has been estimated at US\$ 900/ton for this exercise. Value added has been estimated at 89 per cent of gross production value.⁸⁵

Non-quantitative benefits are those related with the transfer of skills and technology, the opening of new markets and trade relationships, etc. However, these benefits would have been reflected, directly or indirectly, in the flows of economic benefits above described.

⁸⁴ The assumption of a social price of salaries equal to 0 is rather strong, giving the fact that unemployment rate was not too high during the period 1990-1995 and that skilled labour is required for the sector. This assumption would result in overestimating net benefits. On the other hand, giving several indicators of idle capacity in the Argentine economy, assuming that all incremental operative costs are considered as net costs for the economy is also a matter of discussion. This assumption would result in underestimating net benefits.

⁸⁵ No official (nor reliable) information is available on prices, GPV or VA for the sector. Only Exports series seem to be consistent. It has been estimated that, for 1996, a GPV for the sector equivalent to US\$ 1,500 million while exports for this year were US\$ 1,030 million. Hake constitutes approximately 34 per cent of the value of exports and approximately 400,000 metric tons (for a total declared hake catch of about 584,000 metric tons). Therefore, the implicit average price has been estimated at US\$ 900/ton. Estimates indicate that value added is about 85 to 90 per cent of sectoral GPV. For the hake sub-sector, VA was estimated at 89 per cent of GPV. (See Schonberger and Agar, 1999.)

9.4.3 The negative social, economic, and natural resource impacts and costs estimates

The main negative impacts (costs) have been the following:

- a) degradation of the hake biomass (i.e. the value of the natural resource);
- b) increased costs for fisheries regulation and control;
- c) subsidies costs;
- d) corruption practices;
- e) non-diversification of catches;
- f) investment oversizing (fleets, ports, etc.);
- g) other: i.e. abrupt unemployment.

From the point of view of CBA, the main costs are those associated with the degradation of the biomass. Theoretically, this is always a very difficult question to answer, i.e. what is the value of a natural resource?

From an orthodox economic point of view, the value of the resource would be equivalent to the market price, and this price would strictly depend on market conditions. For example, even with a very rigid and high demand, if supply is great enough, the price would be zero. This would be the case of air and other so-called 'free-goods'. On the other hand, if the resource is non-renewable and demand is sufficiently high, the market price would rise to include a 'rent component' (i.e. this would be the typical case of good agricultural lands, minerals, etc.). The free movement of prices would regulate, under this conception, the use of natural resources: i.e. a degradation process would lead to higher prices of the resource which in turn would shift the production to other alternative resources and/or slow down the exploitation of the resource.

However, thousands of extinct vegetal and animal species, the unsustainable use or consumption of natural resources, as well as other environmentally originated questions are tragic proof that the system according to orthodox economic theory does not work. Free-market forces without control cause the degradation and even extinction of many biological species. It can be said that the abuse and unsustainable use of renewable natural resources makes them non-renewable.

This CBA exercise assumes that the sustainable use of natural resources is the basis for estimating its value. With adequate scientific information, it is always possible to estimate a maximum rate of exploitation that ensures the sustainability of a given species. In the long term, the discounted value of this flow of sustainable catch can be considered as the value of the resource.⁸⁶

Any violation of this rate has negative impacts on the future flow of catches, and this should be considered as current costs for the society. Regulated exploitation of natural resources causes incremental costs derived from the operation of control systems. These costs should also be included in the CBA.

⁸⁶ With given technological parameters and its associated prices and costs. The level of the rate of discount would also have impacts on the value of the resource.

In addition, for this particular case, there would be other costs derived from the fiscal transfers to the sector (i.e. Patagonian ports reimbursements, EU subsidies) derived from special legislation and agreements.

There are other costs difficult to quantify, associated with the effects of corruption practices and the social costs of abrupt unemployment as well as costs associated with the idleness of the oversized equipment and other capital goods.

9.4.4 Cost-benefit analysis

The exercise consists of assuming a policy decision-maker in 1990 that had to decide between two different basic alternative policy packages. The first one is equivalent to the factual situation (with two different consequences after the year 2000). The second one implies assuming an optimal sustainable fisheries management policy (simplified as catches equal to the TAC determined by the Federal Fisheries Council or the SAGPyA).

Discounting the flows of net benefits associated with each alternative, over a period of thirty years,⁸⁷ provides an economic indicator of the relative convenience of each option.⁸⁸ The profitability indicator is the net present value (NPV) of the net benefits flows.

The main basic assumptions for the estimate are as follows:

a) Given the relative openness of the economy, prices of goods, foreign exchange and capital are market prices considered as 'proxy's' for the social opportunity cost of each good and/or factor service?

b) The annual rate of discount is estimated at 10 per cent (equivalent to the opportunity cost of capital for the world; at 20 per cent (estimated at the opportunity cost of capital for the Argentine businessmen) and at 4 per cent (estimated as an appropriate social rate of discount that includes adequate concern for future generations and the environment).

The costs of the biomass degradation were assumed to be the loss of incomes (i.e. value added) due to the loss of catches and, during the fishing years, the over-catch is also considered as a cost.

c) There are three projection hypotheses, as follows:

- the first one is assuming a total loss of the hake biomass in the Argentine waters from year 9 to 30;
- the second is that of assuming a total loss of the hake biomass from year 9 to 14 and afterwards catches respecting the TAC;
- the third hypothesis is that of assuming catches respecting the TAC (optimal regulation policies).

⁸⁷ More than thirty years provides negligible values to NPV.

⁸⁸ Discounting (that is, lowering the value of a natural resource over time) is a problematic issue in the valuation of natural resources. It has been pointed out that market discount rates need to be adjusted downwards to social rates, given that the use of market interest rate has a bias towards future generations. (See Rietbergen-McCracken and Abaza, 2000.)

Naturally, the projection hypotheses could be more. The first one can be described as ‘catastrophic’ while the second one is rather optimistic. For the sake of simplification, it is felt that they are useful tools for an adequate characterization of the real evolution of the hake catch and for the forecasting of eventual consequences of the set of policies adopted during the 1990s.

Under these assumptions, it is easy to prove that the whole fisheries sector performance of the last 10 years constituted an enormous policy mistake and an impressive cost for the Argentine economy and society.

Figure 23 shows the results obtained under the different hypotheses presented above. (Figures 29-31 are appended).

FIGURE 23

Alternative fisheries management policies

<i>Alternative Fisheries Management Policies</i>			
<i>Net Benefits Results</i>			
<i>Alternative Hypoth.</i>	<i>NPV at 4%</i>	<i>NPV at 10%</i>	<i>NPV at 20%</i>
(1) Factual Hypothesis	-501925	738261	935350
(2) Factual Hypothesis (II)	3062390	1751488	1092956
(3) Optimal Hypothesis	5074495	2748817	1435678
Net Cost ((3) - (1))	5576419	2010555	500328

Source: CEDEA.

In fact, the comparison of the NPV (at a social rate of discount of 4 per cent), for the best policy package with the worst factual situation shows that the economy would have lost approximately US\$ 5,600 million.

It is interesting to point out that, with the above-mentioned assumptions, the **value of the hake biomass could be estimated at the equivalent of US\$ 7,900 million** (at a social rate of discount of 4 per cent). That is to say, this is the NPV of the flow of net benefits equivalent to the value added that corresponds to the TAC, at constant prices.

It is also interesting to point out that the net costs for society diminish as long as the rate of discount rises: in other words, the ‘market rate’ is short-sighted with respect to any concern for future generations and a sustainable environment. As a matter of fact, the net cost for the society would only amount to US\$ 500 million when the ‘businessmen’ rate of discount is applied.

9.4.5 The distribution of benefits and costs

A matrix simulating the flows of benefits and costs and its distribution among different stakeholders is presented below. The exercise has been estimated for two policy-hypotheses:

1. the 'optimal policy' alternative, and;
2. the worst factual situation.

The stakeholders have been identified as (i) the fishing firms; (ii) the workers (fleet and industry); (iii) the Argentine Fiscal Authority; (iv) the EU taxpayers; and (v) the future generations (mostly Argentine)

FIGURE 24

Factual situation (hypothesis 1)
(in thousand US\$)

<i>Stakeholders</i>	<i>Profits</i>	<i>Salaries</i>	<i>Subsidies</i>	<i>Taxes</i>	<i>Losses</i>	<i>Total</i>
Fishing firms	1607000		-366242	-320000		1653242
Workers		1425000				1425000
Argentine Fiscal Auth.			-269310	320000		50690
EU Taxpayers			-96932			-96932
Future Generations					-3533924	-3533924
TOTAL	1607000	1425000	0	0	-3533924	-501924

Notes: (1) Taxes are estimated to be 20% of profits.

Source: CEDEA.

Under this situation, the economy as a whole lost approximately US\$ 502 million. This net loss implies profits for the firms for about US\$ 1,650 million, salaries for US\$ 1,420 million, a net profit for the Argentine Fiscal Authority of about US\$ 50 million, a net loss for European Tax payers of US\$ 91 million⁸⁹ and a net loss for future generations of approximately US\$ 3,500 million.

The matrix of distribution in the 'optimal policies' situation shows a very different scenario. In this case, the economy as a whole would have earned approximately US\$ 5,100 million as net benefits. These benefits would have been distributed as follows: the firms with US\$ 2,298 million, the workers with US\$ 2,547 million, the Argentine state would have earned US\$ 229 million, which would have included the costs of an adequate control system and no losses for the future generations would have taken place.

⁸⁹ This is a conservative estimate given that, as indicated in the section on subsidies of this work, even budgeted subsidies from the European Union for the exploitation of fisheries in Argentina have been substantially more the 91 million US dollars. Nevertheless, this conservative figure was used given that it is the figure that can be unequivocally be catalogued as a direct subsidy for activities directly derived from the Argentine-EU fishing agreement.

FIGURE 25

Optimal policies situation (hypothesis 2)
(in thousand US\$)

<i>Stakeholders</i>	<i>Profits</i>	<i>Salaries</i>	<i>Subsidies</i>	<i>Taxes</i>	<i>Losses</i>	<i>Total</i>
Fishing firms	2872800		0	574560		2298240
Workers		2547535				2547535
Argentine Fiscal Auth.			345840	574560		228720
EU Taxpayers			0			0
Future Generations					0	0
TOTAL	28772800	2547535	345840	0	0	5074495

Notes: (1) Taxes are estimated to be 20% of profits.

Source: CEDEA.

Main conclusions

The CBA undertaken on alternative Argentine fisheries policies during the 1990s has shown that:

- a) The hake biomass would have a total value of about US\$ 7,900 million, at constant prices.
- b) The factual policies carried out during the 1990s would have had a net direct cost for the economy of about US\$ 500 million, which includes the assumption of a total degradation of the hake biomass.
- c) An optimal set of fisheries management policies (simplified as respecting the TAC), would have had a net benefit of about US\$ 5,100 million.
- d) Therefore, the opportunity cost of the factual policies in the 1990s would amount to about US\$ 5,600 million, if the hake biomass will not recuperate.
- e) Under a more optimistic scenario, where the hake biomass would recuperate by year 2004, the opportunity cost of the factual policies in the 1990s would amount to about US\$ 2,000 million, provided that the future catches would respect TAC.
- f) The distribution of benefits and costs proves that the main beneficiaries of the 1990s policies would have been the private firms (and the workers) with very low net benefits for the Argentine fiscal revenues (about US\$ 50 million), and an enormous social loss for future generations valued at approximately US\$ 3,500 million.

In conclusion, the adoption of a consistent and strong fisheries control and management policy would have net economic benefits for the economy as a whole and the Argentine society, that would be worth about ten times the factual economic results obtained so far, as indicated by the products of the analysis above. Furthermore, the value of a sustainable hake and fish biomass for future generations do not have, indeed, any price.

9.5 Summary of impact assessment

Although there is argument from very different sources that the fisheries sector in Argentina is in crisis, the roots for this crisis as well as multiple facets are not agreed upon by all sectors involved, or at least not analysed in an integrated manner. In order to implement and achieve corrective policies, it is necessary to determine that the causality and failures behind this crisis be analysed in detail and in an integrated manner. The following is an attempt to search through the multiple issues and deficiencies that have led to this situation.

Information failures

Reporting and provision of data systems are highly deficient. Beginning with the first data reporting steps by industry and vessel operators to statistical analysis, a series of failures have been identified. Catch reports are not filled immediately after each operation, for example, and they are sworn depositions by vessel captains. Therefore, they are open to inadequacies due to a lack of through checks of these declarations which at times can occur following a relatively long period after the activity has taken place. It has been found that these formal statements frequently do not contain real capture amounts or truthful information as to the areas where fishing took place. Chronic deficiencies have been described, subsequently, in official fisheries statistical areas of government, with different sub-system inputs concluding in different databases and registries with large discrepancies in quantitative and qualitative data. Furthermore, many of the information databases are not publicly available, making this information non-transparent. This, of course, makes all sorts of analysis as well as policy setting (such as quotas, maximum capture, etc.) ineffective.

Research and analysis deficiencies

The former failings (i.e. deficient data systems) is conducive, in many cases, to deficient research and analysis. Furthermore, although the information base for particular species is quite well known, or estimated with a relatively high degree of certainty, a great amount of biological data is unknown. Moreover, an array of environmental questions and interactions are ignored at this time, once again straining the evaluation of impact and the application of corrective measures. Data and analysis on the commercial structure of the fisheries system are not comprehensive, nor homogeneous between sources, nor well developed. At last in this subject, there is an almost total lack of holistic analysis that takes into account the integrated nature of fisheries. That is, there are no examinations of the fisheries sector that include analysis of ecological, economic as well as social factors and their interactions.

Command and control failures

Command and control failures of different sorts are one of the crux issues to deal with in Argentine fisheries. Throughout the whole system of fisheries, a high rate of control failures are identified, from weak administrative structures at the national and sub-national levels, the fragile application of norms, to inadequate systems of vigilance over the activity per se. The high rates of capture (even reported captures) that multiply permitted captures are just one indicator of command and control failure. The command and control failures have also had an impact on the ecosystem due to pulse fishing patterns present, given the stop-

and-go application of biological stops or other fisheries control norms. Failure to prosecute legal violations in the past is another indicator of command and control failing in the sector. A special case or symptom in this area to be taken into account is the high degree of corruption, in both public and private sectors, which has characterized exploitation of fisheries in Argentina in recent times. Irregular permit request and granting, manipulation of satellite systems on vessels, and even the operation of vessels without any type of legal permits have been common occurrences.

Market failure

Economic evaluations, incorporating the issues of subsidies and overcapitalization, have indicated that market failures have occurred in the case of fisheries in Argentina, even by conservative estimates and even by dealing exclusively with quantifiable costs (as seen elsewhere in this report). Economic policy instruments that would derive in sustainable development management have not been applied in this case. Even basic measures of royalties, fees and other standard economic measures to capitalize the sector have been deficient in a strictly economic sense, given that they have not been sufficiently compensatory to countervail resource degradation (creating a synergy between market failures and command and control failures).

Conclusions: inter-relationship between management system and economic aspects of the fisheries sector

Altogether, it can be said that the problems faced by the Argentine fisheries sector after liberalization are due to an ingrained inter-relation between management questions with economic issues. The problems faced by the Argentine fisheries are classic mismanagement regime issues compounded by economic flaws. The literature in this area tends to focus on three types of administrative regimes, which will be explored vis-à-vis the Argentine case, also looking at the temporal dimension (i.e. short term and long term) that each management system has and its economic connections. These management types are: *open access*, *catch control*, and *effective management*.⁹⁰

An *open access* regime is basically a system without control of the quantity of resources fished and where the fish captured is not paid for adequately. Activities are carried out without a genuine cost to the fishers or the fishing enterprises where licenses (if at all required) are minimal in relation to the value of the product or are mere formalities. This type of fisheries resource administration leads to two types of difficulties when the matter is examined comprehensively: (a) physical over-exploitation that in the long term could lead to serious drops in the yield; and (b) economic over-exploitation where the marginal value that individual fishing companies represent to the economy is less than if the enterprises would be pursuing a different economic endeavour. Open access regimes for fish exporting countries (as is the case in Argentina) without trade barriers (which to a certain degree has happened in the Argentine case) leads to fishing being a more profitable activity

⁹⁰ Although these characterizations are quite standard, much of the theoretical background to this section of the study is based on the following publications: Hannesson, R. "Effects of Liberalizing Trade in Fish, Fishing Services and Investment in Fishing Vessels"; OECD Papers, Offprint No. 8, 2001 and *Transition to Responsible Fisheries: Economic and Policy Implications*, OECD, 2000.

over time. This means that the activity increasingly draws in capital and labour. In general terms, it is found that expanded catch leads to export growth. However gains dwindle and, in the longer term, they are outweighed by the losses. As it has been seen in the data presented thus far, the Argentine case follows this pattern very closely.

Catch control regimes are an improvement over open access systems since total catch from a particular species is regulated, either directly or indirectly. Direct catch control is carried out by setting (and meeting) a total allowable catch, or indirectly by curtailing the fishing boats' actions. However, with this type of management scheme, biological damage is avoided given that fishing terminates once the allowable catch (based on calculations of maximum sustainable yield) is met. In economic terms, nevertheless, the end result is similar to the case before, given that although more fishing capacity than needed could be attracted, the economic value to the economy as a whole is set by the quantity of fish allowed to be caught. Therefore, marginal gains are minimal or non-existent. For the individual firms, since there is a competition or a so-called 'race to fish' as much as possible as quickly as possible, this situation leads to diminishing rent for the firm, given that this sort of behaviour entails larger fleets, amended technology to meet this end, and therefore higher costs for fishing activity.

This is also what has been called an 'Olympic' fishery. In the long term, and analysing this with economic issues such as the reduction of trade barriers for fish exporting countries, the opportunity to sell, and price variations does not conduct to a decline in fish stock given that this is controlled. Yet, the growing profitability of this economic endeavour in this circumstance attracts more labour and more vessels. This in turn will lead to shorter and shorter seasons due to the fact that fishers will compete to catch as much as possible before other fishers do the same, leading to higher costs. Gains from increasing trade will, in turn, wane. In general economic terms, for a country with this management situation, profits are essentially the same as under an open access system. Formally, this is what the Argentine fishing system was supposed to be until the late 1990s. That is, officially Argentina has operated under a catch control system. Nevertheless, as has been thoroughly documented in this work, that this has not been the case for most of the stock captured in this country's fishing zones.

A third organizational type is called *effective management* where predetermined catch levels are not only set by biological variables but by an economically optimal guide. In this type of regime, government authorities set a capture limit, yet this is done with incentives to industry to maximize the value derived from the captured stock. This regime, therefore, acts as a precaution for long term use and benefit derived from the renewable resource. Several different tools are proposed for this type of resource administration that, it must be stated, is still a theoretical regime throughout the fisheries of the world. The tools proposed are not only individual transferable quotas but also other licenses or concessions sold to vessels. That is, licenses whose cost should reflect a value beyond the boat's price but also mirror the resources' worth. Here the temporal factor is incorporated by anticipating the long term depletion and preventively applying measures to thwart resource reduction, yet at the same time incorporating economic dynamics that maximize value. The Argentine system, in particular after normative reform in the late 1990s, aspires to the implementation of an effective management system.

A summary of management characteristics of the presented regimes is provided in the following figure. This compact also considers temporal and economic effects.

FIGURE 26

**Management regime characteristics and temporal effects
for fish exporting countries**

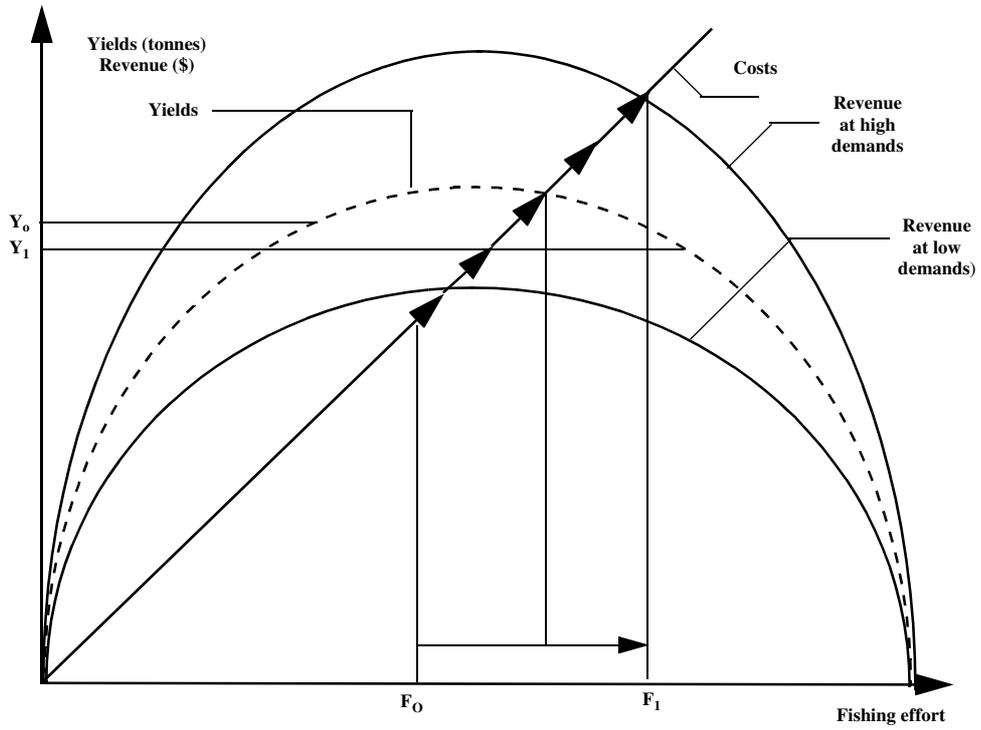
	<i>Open access</i>	<i>Catch control</i>	<i>Effective management</i>
Catch level	Fish resource limits disregarded, competition among fishing firms for greatest capture	Allowable catch set and enforced by government	Limit set by government
No. of fishing boats	Same as above	Set by extension to obtain highest portion of allowable catch by each vessel ('race to fish')	Limited by cost minimization of industry firms or by government
Other elements (technological, etc.)	Same as above	Same as above	Limited by fishing companies' cost minimization. Can be partially limited by government
Short term effects	Increased catch	Increased effort, no change in catch, higher profits, gains from trade	No change in effort unless higher allowed catch, gains from trade, higher market value of quotas and licenses
Long term effects	Decline in catch and stocks decline, loss from trade	Increased investment in fishing boats, no change in catch, small gains from trade	Same as above

Source: Extracted from Hannesson, R. "Effects of Liberalizing Trade in Fish, Fishing Services and Investment in Fishing Vessels", OECD Papers, Offprint No. 8, 2001.

The basic commercial dynamism of over-fishing is, evidently, interconnected with the biological aspects of a natural renewable resource. Theoretical aspects of this dynamic are long standing, and particular cases—such as the one from Argentina—tend to corroborate these hypothetical situations. Hypothetically, stock reaches a biological maximum expressed as maximum sustainable yield (MSY). Extracting fish resources beyond this point is over-fishing and, as in an inverted curve, decline in stock occurs in a situation without restrictions on capture (open access). This situation has been modelled as in the graph (Figure 27) that follows.

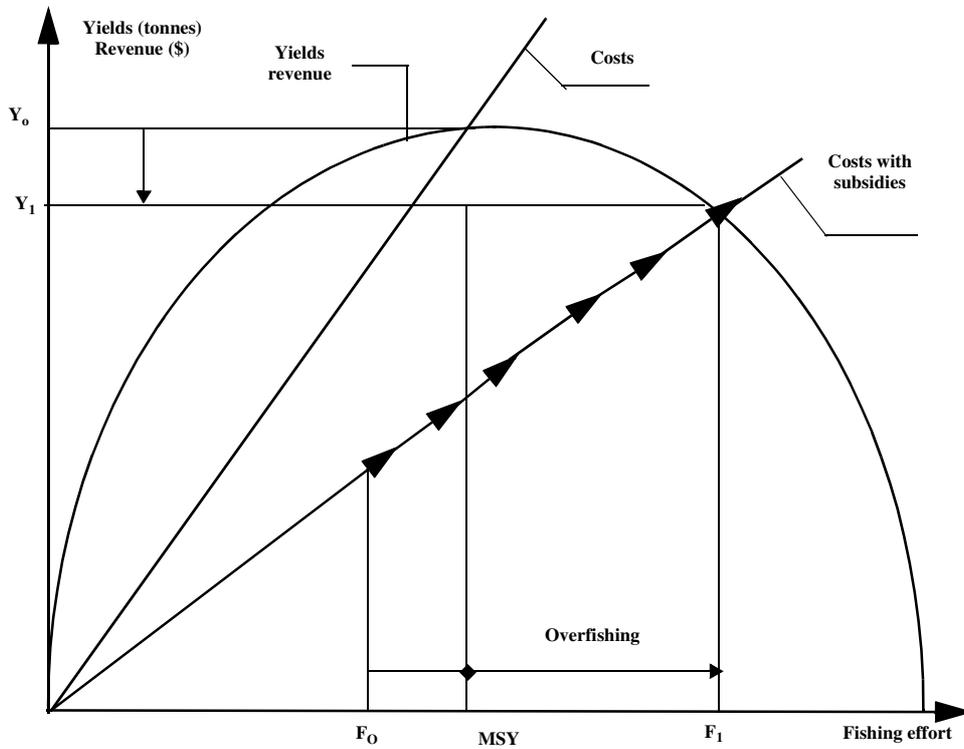
In the beginning of commercial exploitation, revenue is similar to costs, therefore there is no disposition to enter the industry, and market equilibrium is well below MSY (F_0). With increasing demand, extraction technologies upgrade, price, and fishing capacity (and therefore extraction of resource) increases together with effort. Yet, this dynamic also arrives at a point where costs are equal to revenue (F_1). A cyclical situation is then present with declining yield progressing downward as is declining revenue. The Argentine case is (as can be seen below in Figure 27), an instance where these theoretical functions are reflected in actuality.

FIGURE 27



Source: World Trade Organization, "Special Studies 4: Trade and Environment", Geneva, 1999.

FIGURE 28



Source: World Trade Organization, "Special Studies 4: Trade and Environment", Geneva, 1999.

A second situation has been modelled with the added factor of subsidies. The fishing industry, as has been seen elsewhere in this report, is highly subsidized world-wide. The cost to industry is lowered and consequently distorted (downward shift in the graph) and therefore leads more quickly to or exacerbates an over-fishing situation (as can be seen above in Figure 28).

10. POLICY PACKAGE

Based on the preceding findings as well as multi-stakeholder discussions, a series of policy measures that include economic as well as command and control instruments can be recommended. Due to the manifold nature of the problem, involving socio-economic as well as natural resource variables, an action plan should address the issues in an integrated manner.

Furthermore, it is essential to comprehend the integrated nature of the recommended actions. That is, economic measures without adequate command and control policies (or vice-versa) are not feasible to address the multiple issues involved.

Also, the approach with regard to policy recommendations in this study is one of feasibility and certain consensus, at least by groups of stakeholders. This also implies that several of the policy recommendations are already in the process of being applied, in particular in recent times.

The design of the package should be carried out in such a manner as to include local characteristics. Contentions with the implementation of the system should also be acknowledged and factored in. Furthermore, market instruments do not in and of themselves lead to environmental and socially sensible decisions. Therefore, economic measures and market-based instruments should be implemented with this in mind.

10.1 Main impacts identified (positive and negative): environmental, economic and social

Several impacts (both positive and negative) have been identified in relation to trade liberalization and the fisheries sector in Argentina. They can be summarized as follows:

POSITIVE IMPACTS	NEGATIVE IMPACTS
a) Increase in fisheries production.	j) Degradation of fisheries biomass;
b) Increase in exports;	k) Negative ecosystem impact (removal of primary and secondary productivity);
c) Increase in employment in some areas (Patagonia and harvesting activities);	l) Increased costs for fisheries regulation and control;
d) Improvement and growth of the fisheries fleet;	m) Increased operation costs;
e) Technological innovation in the sector;	n) Increasing fishing effort;
f) Increased research facilities and skills;	o) Run to fish;
g) Opening of new markets and trade exchanges;	p) Fiscal costs (subsidies);
h) Increase in public income;	q) Corruption practices;
i) Regional infrastructure investments (ports, other infrastructure, new firms, etc.).	r) Non diversification of catches

(Continued)

POSITIVE IMPACTS	NEGATIVE IMPACTS
	s) Investment oversizing (over-capitalization of fleets, ports, etc.); t) Increasing unemployment in some areas (Buenos Aires and processing activities); u) Decline in work conditions and labour informality; v) Social unrest.

10.2 Economic instruments for sustainable fisheries management

Several economic instruments have been identified that feasibly may revert the current situation of degradation of the resource, falling revenue and decreasing employment. Furthermore, these plausible economic instruments have also been pointed out as a break-out from deepening social conflict arising out of open access to common resources. Although stakeholders do not fully agree between themselves what could be plausible solutions, different sectors or interest groups have put forth many of these recommendations. State and non-state actors have to some degree considered all of these approaches, indicating the potential for policy adoption and a certain degree of feasible implementation.

The economic instruments proposed can be perceived as two types:

1. Economic tools to capitalize the sector and generate public revenue that, to some extent, incorporates into the commodity's price full-cost accounting of the natural resource, and therefore reduces market distortion.
2. Economic tools that direct fisheries exploitation to a mode that reduces pressure on the resource (i.e. fosters sustainability) while at the same fosters gainful employment and generates revenue.

10.2.1 Market-based instruments: quota management system

As it has been established elsewhere in this study, the National Fisheries Law of Argentina (adopted in 1997) prescribes the implementation of a quota management system (QMS) for fisheries exploitation where individual tradable quotas (ITQs) are set by the Government and are exchangeable via a secondary market. Although in recent times the process of implementation has begun, at the time of publication, this is still in process.⁹¹

The implementation of the quota system is not without criticism and receives a series of resistance from different areas (such as the private sector and some sub-national governments), but it can be said that some market failures could be corrected by proper implementation of 'quotification' systems to reduce market distortions. The fulfilling of the quota

⁹¹ Furthermore, a commitment to the implementation is present in several different areas. For example, given the low cost recovery for management to implement such a scheme, the Government of Argentina has taken on a US\$ 5 million loan from the World Bank to "build capacity for operation of a quota management system (QMS) for fisheries ..."

system is a pending matter, not only for the implementation (i.e. the design of quotas) but also its execution.

Opposite to the rules of other countries, ITQs are set by the Fisheries Law and should, therefore, be based on various criteria established in the norm. That is, several issues of contention in the setting of quotas in other countries (such as, for example, acquired rights) are already set by the norm. The capture quotas are to be established by species, vessels, fishing zones, and type of vessel. Moreover, all quotas are temporary and there are restrictions so that no one company or holding should be granted the total TAC of any one species. Also, the criteria to be taken into account when granting quotas are:

- employment of Argentine nationals,
- investments in the country,
- previous fishing records, amounts captured as well as sanctions, (catch history).

Capture quotas would be totally or partially transferable through the payment of transference fees. Transference of quotas will not be allowed from ice trawlers to processing fleets (i.e. transference cannot take place between different types of ships). The Federal Fisheries Council may reserve a portion of the TAC as an administrative/conservation measure, and the same can be assigned according to society's sectors most in need.

With these guidelines, quotas are to be established. They are to be set in a way that transferability of ownership is feasible (i.e. for the creation of a quota market).

The setting up and running of a quota management system is a challenging endeavour, given the preconditions necessary, the conflict situation present, as well as the lack of fully successful implementation experiences in developing countries. The following section will observe several general indications as to the application of individual transferable quotas in fisheries systems.

Background to individual transferable quotas

Individual transferable quotas is a tool of the type utilized in several experiences in order to manage environmental externalities through economic instruments. This, as with other economic devices, has been encouraged as one of the ways to improve management of environmental impact. ITQs are logical extensions of 'tradable emission permits' to the fisheries sector. As in other types of quotas and tradable permits, the information is still piecemeal given their recent application, in particular in developing countries. Therefore, considerable advocacy of these types of instruments is based on theoretical discussion and not so much on actual practice. (OECD, 1997)

The management of fisheries resources through economic instruments attempts at, in theory, an improvement over other methodologies that allow for a 'run to fish' in open access fisheries. That is, it is presumed that clearer methods of use of the resource⁹² will de-

⁹² Although in some cases 'ownership' rights are supposedly defined with ITQs, this is not the case with Argentine fisheries since ownership of common resources remain within the State. That is, quotas in this case could better define access but not ownership.

rive in better management that somehow provides a better measure of rent, and reduces dissipation of resources. The 'common property' characteristic of public goods, such as fisheries resources, is deficient in a system with large-scale exploitation and diminishing resources. Therefore, if there is no restraint on fisheries exploitation, the tendency is for individual operators to incorporate externalities into the operation. That is, there are no incentives to prevent over-fishing or 'race to fish'.⁹³

A quota management system implies greater definition of use as well as improved use charges to be levied. The transferability factor implies an opportunity to use market forces, in addition to policy, in order to control fisheries exploitation.

However, there are various points of contention as well as challenges to acknowledge for the future implementation of the quota management system. In very broad terms, there are two main points which international literature indicates as crucial for the application of ITQs. These are: a thorough control of the fisheries system and an independent and comprehensive scientific system.⁹⁴ Therefore, although the quotas are based on market tools, for their successful realization they must rest on adequate command and control mechanisms to direct their application, as well as scientific policy that leads to complete knowledge of fisheries variables (biological and others) as the basis for setting of quotas. These are particular challenges to the Argentine case given that previous failures in these two areas imply a great deal of resistance to a quota system from several actors.

Quota design and implementation

An important aspect in the implementation of the quota system is its design. As stated previously, some design factors are already set by law and are, therefore predetermined. Others could be designed and implemented to avoid skewing the quota market. That is, policy has to be defined in order for the quota system to be a tool and not an end to itself. In general, the policy attempted through a QMS is the reduction of over-fishing and 'race for fish'. Nevertheless, some nations have sought other outcomes through the accomplishment of ITQs, namely cost recovery, rent extraction of a publicly owned natural resource, cost recovery for fisheries administration, and even clearer extraction rights by actors. A quota system should, therefore, respond to clear policy as a tool that should respond to a series of policy objectives by the State.

The usual significant actions associated with the design and implementation of an ITQ system are: the definition of rights, the allocation of these rights, the setting of a market for secondary trading of quotas, natural resource rent extraction, management cost recovery, as well as abatement of negative social impacts that such a system usually implies (see Schonberger and Agar, 1999). Some of these variables are effects to grapple with in the Argentine case. Certain of the principal forewarnings and possible hindrances on the success of quota management systems are described below:

⁹³ "Race to fish" situations are present, such as in the Argentine case, when TAC limits are set in a situation of overcapacity. Total allowable catches set, although are effective in confining capture in an adequately managed system, induce the individuals involved in fisheries to hasten to capture as much as possible early in fishing season. This implies that there is a "race" to fish resources and therefore each individual enterprise maximises own share of total catch.

⁹⁴ As can be seen in Appendix: Quantity of main species, Years of Evaluation 1997-1998, even for the scant number of species studied, the estimations on biomass are rather tenuous in most cases.

- **Concentration of market.** A risk present with ITQs, as with many market oriented instruments that regulate environmental variables, is the possibility of concentration in a few quota holders. Within this issue, many other tangential questions arise such as the factors of transferability and ownership of quotas. The concentration factor is a topic to contend with in Argentina, given that the industry is already highly consolidated.
- **Resistance by industry and other actors.** An uncertainty factor in the establishment and running of the system is the resistance by industry and other actors that have been accustomed to act in a basically unregulated and free-of-charge environment. Although all of this resistance cannot be diminished at once, given that unregulated fishing has been highly beneficial for some actors in the short term, consensus building, transparency and dissemination of the design methodologies and implementation scheme can in some form reduce disavowal by industry and other actors.
- **Social compensation measures.** In an over-fished system with inherent over capacity, such as the current Argentine system, the implementation of ITQs could greatly imply the reduction of effort and therefore further rationalization in the harvesting and processing industry. Therefore, the quota management system should acknowledge these problems, in particular given that the cases where the system has been applied to date has generally been in developed countries with greater budgetary and fiscal capacity to allocate compensatory measures and subsidies, which is not the case in Argentina.
- **Monitoring capacity.** Although the quota system is an economic instrument, it is intrinsically linked to correct monitoring capacity. The same is a point of contention locally, due to a great degree of non-compliance, lack of control, as well as the extensive EEZ over which patrolling is required. Several aspects, such as port inspections, monitoring on board, and different forms of mechanic and/or electronic surveillance systems need to be perfected and/or applied for compliance with a quota management system.

Quota system's negative impacts

Quota systems are not free, however, from criticism. A growing body of international literature is beginning to question their effectiveness from different perspectives, such as the conservation/rational use viewpoint, adverse impacts on economic productivity, or even from employment/social aspects (Copes, 1996).

Individual transferable quotas have been associated with adverse effects on fish resources due to (a) encouraging dumping of by-catch or of fish of poor quality or size/high grading; (b) data fouling; (c) quota busting and poaching; (d) as well as price dumping (that is, discarding low price catches after being caught), among others. An admonition on quotas from a social point of view has also been articulated, indicating that the privatization of fishing resources can have adverse impacts on distributional equity and community viability. Critics of ITQs indicate that they have led to a high concentration of profitability with at the same time negative impacts, on communities and fisheries habitats that greatly outweigh these economic benefits.

Labour and fisheries adjustment through a quota system

The adjustment process, which in the Argentine case would be through a quota system, has strong implications for the labour force. Due to the distinguishing factors that fisheries labour has and the close relationship between a primary natural resource and employment, analysis of the implementation of quota management systems (as other output controls), in a context of responsible fisheries adaptation, has derived from several theoretical and hypothetical analysis—most of them, however, in industrialized countries. The impact of adjustment through quota systems indicates that the expected effects vis-à-vis different variables related to labours is as follows:⁹⁵

- | | |
|---|----------------------|
| • Length of fishing season: | Increases |
| • Stability within the season: | Increases |
| • Catch per Unit of Effort (short term) | Remains the same |
| • Catch per Unit of Effort | (long term)Increases |
| • Harvesting employment | Decreases. |

The tendency, therefore, is for falling employment in the harvesting sector. Nevertheless, this can be (and has been in different experiences) counterbalanced by employment upstream. Delaying transformation to more drastic situations makes adjustment much more critical.

However, sustainability measures should include a through understanding of how fisheries resources interact with the labour market. It is therefore essential to comprehend this interaction in order to implement policies that take fully into account employment issues for changing management system.

Conclusions on quota management systems

Although the implementation of quota management systems are driven by several international institutions, the evaluation of these tools, as for all economic instruments used for environmental management purposes, is still inconclusive. A further complication in comparative terms for QMS is that this would be the first time that such a mechanism would be implemented for a whole fisheries system in a developing country, with all the caution and hindrances that such a situation entails. Lastly, it is also the first time that such an economic instrument would be utilized to avert a collapse, a situation never experienced before.

In general, the effectiveness of these tools has not generally been tested, the experiences are too new and the data is still lacking to conclusively indicate their efficiency. Furthermore, some problems still remain when too few participants are part of the market created by the tradable permits of all types. Also, the utilization of these instruments is generally applied with some givens which must tested against real situations, as for example the use of cost recovery funds for improved management, or the belief that a greater perception of ‘rights’ by industry would be conducive to improved sustainable practices. Therefore, although the tool is one of a series of instruments that can be used to improve fisheries management, a great deal of analysis is also necessary.

⁹⁵ OECD 2000.

10.3 Changes to the sector's productive and economic structure

Regarding economic instruments for sustainable development, a generalized agreement persists that there has to be a fundamental change in the economic and productive structure of the sector in order to halt future degradation as well as to generate value and provide employment. Value added production is seen as the alternative to stock reduction as well as decreasing rates of employment.

The change from an intensive exploitation in a commodity mode to the use of resources with value added (with the usual admonitions that this modality entails, such as the need for clear plans and identification of destination markets, international markets dynamics, clients, etc.) is the tract indicated by most as an effective way to solve the sector's problem. Re-dimensioning the fishing fleet is another change that can be perceived as a technological alteration. Yet fishing fleet reduction should be accompanied by reconversion, if income generation and employment is to be maintained or increased.

Other market-based instruments involve the identification of markets and technologies, in particular in order to shift use towards sub-utilized species and therefore decrease exploitation concentrated on very few species. Market studies to develop these mechanisms need to be implemented.

The economic instruments indicated for this re-conversion indicated in the literature should be those that provide tangible and intangible incentives, from private and public sectors, to re-convert production toward the production and commercialization of products with high value added.

The analyses needed for this, as a first step, are multiple, and therefore should be previous to any implementation. Given the nature of the product and the markets to which they are exported, a series of issues needs to be analysed and knowledge generated and used. The analysis and actions that can be recommended include:

- global commodity chain analysis;
- studies of ecological product differentiation;
- policy driven approaches.

With fisheries resources from Argentina, as with many products in the global market, many aspects can be analysed from a global product chains perspective. Given that the majority of the products are consumed abroad, this global market factor needs to be taken account if and when a mode change is proposed, such as the in the export of products with value added.

Nevertheless, a major stumbling block in this area is tariff escalation. In this case, as in many others, although national policy is commendable, it collides against tariff escalation and other trade protection measures by industrialized consumer countries.

10.4 Other measures to improve management and use of fisheries resources

Many other measures to improve management and use of marine fisheries resources have also been identified. These can be classified as:

- Technological and exploitation mode changes

- Reduction of overcapacity
- Command and control changes
- Political revisions.

Technological and exploitation mode changes

Technological changes imply in this case modifications of the fishing gear used in fisheries, and changes in mode of exploitation to imply the diversification of species used, to reduce pressure on any one resource or reduced number. The re-conversion to and rational utilization of other fisheries resources that are not near collapse, and a partial shift to aquaculture, were pointed out as other goals to reduce pressure on overexploited resources. These technological and resource-use changes need to be accompanied by training and policy modifications.

The change of gear is a specific improvement to be implemented. Gear currently utilized, in many cases does not discriminate species, entailing the capture of less desirable species or species with less market value than the target product. The non-differentiation indicates that non-target species are caught together with the target products and the undesired ones are by-catch, enormously increasing discards.

A second issue is the non-differentiation of juveniles. Gear that catches juveniles together with adult-sized fish is amply utilized. The capture of juveniles therefore is large scale. The improvements to be implemented indicate that the use of gear that discriminates by species and by size needs to be regulated and enforced.

Command and control changes

The need to amend and improve command and control features of the fisheries sector is one of the key areas to work on to rectify the course that fisheries exploitation has taken in recent years in Argentina. The lack of legal effectiveness to date, and even the lack of implementation of foreseen economic measures are both aspects of these fallacies.

It cannot be overly emphasised that some of the most serious impacts of trade liberalization in the Argentine fisheries sector has been the implicit and explicit lack of control over resource extraction. That is, accompanying the policies of trade liberalization in Argentina, a tacit as well as definite *laissez-faire* in the application of policies to control harvesting took place. Private sector non-compliance has been a comprehensive aspect of this situation.

Therefore, a high degree of latitude for improvement is present. Several different improvements have been pointed out, such as:

- improvements in surveillance systems;
- improvements in inspection (on board and on harbour) methods;
- review of licensing and registry systems;
- enhanced monitoring systems;
- amendment of industry reporting requirements.

All of the above advances should be coordinated to safeguard compliance and enforcement of current and future fisheries administration plans. It has also been pointed out that the trustworthiness of the new system to be implemented—QMS—will be driven by a comprehensive, fair and transparent monitoring and enforcement system.

Conclusions: policy revisions

Policy revisions are an overarching aspect of all proposed or implementable changes. By this, it is meant that not only the mechanics of the instruments have to be altered, but also the underlying principles have to be substantially modified. A running theme in the evaluations is that the problems present in Argentine fisheries have a marked international dimension. Therefore, the issues and corrective measures do not only relate to economic and local command and control issues, but also to political factors of international dimensions.

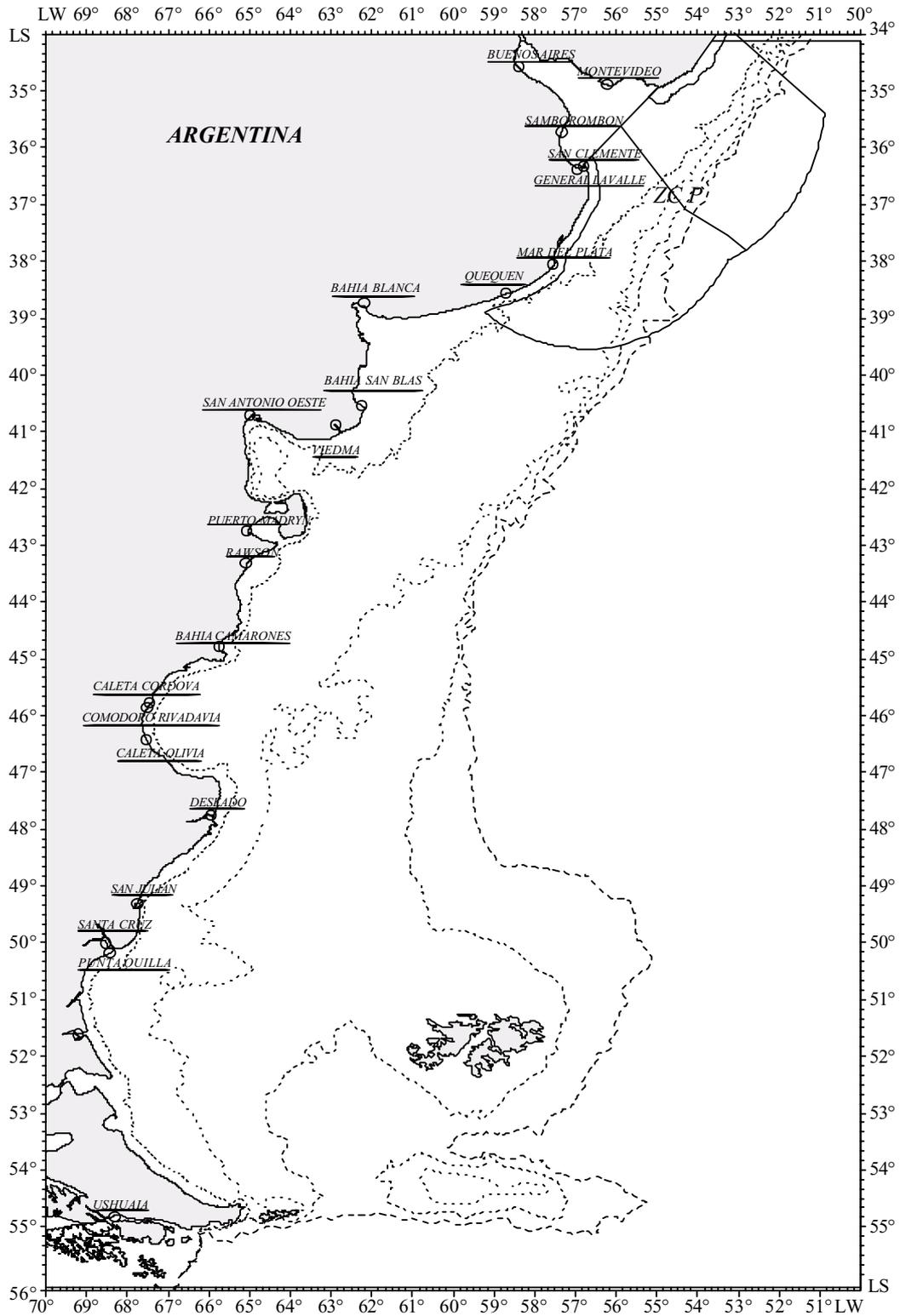
Corrective measures, in particular concerning the international dimensions, should take into account that there should be active support for the modification of international systems (consumption patterns, global fisheries' status, regional management and not least international economic aspects). New negotiations of international fisheries accords in which Argentina is party, active participation in trade/sustainable development debates and in other such policy-setting mechanisms where the role of fisheries in developing countries are set, are guiding principles for these type of revisions.

The failures of the international economic system for non-commodities expansion, such as fisheries, from developing countries are another aspect that must be acknowledged. Disloyal international competition, tariff escalation, and subsidies are integral parts of policy transformations at the international level that have to be part of the modifications to make fisheries sustainable.

The integrated impact assessment in this case has demonstrated, however, that the causality factor is linked and multidimensional. Therefore, the policy approach to address the negative impacts must be at the same time linked and multidimensional. Policies which are regulatory in nature must be implemented together with market based approaches if an integrated package is to be implemented. They are not separable in the problem and they cannot be separable in the solutions.

ANNEX 1

Map of Argentine continental platform and ZCP



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APPENDIX 1 : TABLES FOR COST-BENEFIT ANALYSIS

FIGURE 29

Factual hypothesis : NPV with total loss of hake biomass after year 2000

<i>YEAR</i>	<i>VALUE ADDED</i>	<i>SUBSIDIES</i>	<i>COSTS OVERCATCH</i>	<i>NET BENEFITS</i>
1990	273141			273141
1991	327609		13609	314000
1992	294768	40000	0	254768
1993	338022	40000	24022	274000
1994	348435	60000	34435	254000
1995	459774	60000	145774	254000
1996	471789	60000	157789	254000
1997	467784	60000	153784	254000
1998	430157	60000	116157	254000
1999	326960	60000	12960	254000
2000	65000		0	65000
2001	-316000			-316000
2002	-316000			-316000
2003	-316000			-316000
2004	-316000			-316000
2005	-316000			-316000
2006	-316000			-316000
2007	-316000			-316000
2008	-316000			-316000
2009	-316000			-316000
2010	-316000			-316000
2011	-316000			-316000
2012	-316000			-316000
2013	-316000			-316000
2014	-316000			-316000
2015	-316000			-316000
2016	-316000			-316000
2017	-316000			-316000
2018	-316000			-316000
2019	-316000			-316000

<i>YEAR</i>	<i>VALUE ADDED</i>	<i>SUBSIDIES</i>	<i>COSTS OVERCATCH</i>	<i>NET BENEFITS</i>
NPV 4%	(\$501.924,58)			
NPV 10%	\$738.261,42			
NPV 20%	\$935.350,22			

FIGURE 30

**Factual hypothesis : NPV with total interruption of hake catches
between 2000 and 2005**

YEAR	VALUE ADDED	SUBSIDIES	COSTS OVERCATCH	NET BENEFITS
1990	273141			273141
1991	327609		13609	314000
1992	294768	40000	0	254768
1993	338022	40000	24022	274000
1994	348435	60000	34435	254000
1995	459774	60000	145774	254000
1996	471789	60000	157789	254000
1997	467784	60000	153784	254000
1998	430157	60000	116157	254000
1999	326960	60000	12960	254000
2000	65000		0	65000
2001	-316000			-316000
2002	-316000			-316000
2003	-316000			-316000
2004	-316000			-316000
2005	-316000			-316000
2006	316000			316000
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2008	316000			316000
2009	316000			316000
2010	316000			316000
2011	316000			316000
2012	316000			316000
2013	316000			316000
2014	316000			316000
2015	316000			316000
2016	316000			316000
2017	316000			316000
2018	316000			316000
2019	316000			316000
NPV 4%	\$3.062.38 9,64			
NPV 10%	\$1.751.487,50			
NPV 20%	\$1.092.955,76			

FIGURE 31

Optimal policies hypothesis: NPV with hake catches at TAC

<i>YEAR</i>	<i>VALUE ADDED</i>	<i>SUBSIDIES</i>	<i>COSTS OVERCATCH</i>
1990	270295	20000	250295
1991	316000	20000	296000
1992	316000	20000	296000
1993	316000	20000	296000
1994	316000	20000	296000
1995	316000	20000	296000
1996	316000	20000	296000
1997	316000	20000	296000
1998	316000	20000	296000
1999	316000	20000	296000
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2011	316000	20000	296000
2012	316000	20000	296000
2013	316000	20000	296000
2014	316000	20000	296000
2015	316000	20000	296000
2016	316000	20000	296000
2017	316000	20000	296000
2018	316000	20000	296000
2019	316000	20000	296000
NPV 4%	\$5.074.494,79		
NPV 10%	\$2.748.816,73		
NPV 20%	\$1.435.677,72		

Appendix 2 : Quantity of main species in years 1997-1998

<i>Species</i>	<i>Biomass (Metric Tons)</i>	<i>Evaluation Year</i>	<i>Estimated Uncertainty</i>
Acanthistius brasilianus	30000	1998	High
Bassanago albescens	898797	1998	High
Cheilodactylus bergi	200000	1997	High
Coelorhynchus fasciatus	6400	1997	High
Conger orbignyanus	1500	1998	High
Dissostichus eleginoides	14100	1998	High
Helicolenus dactylopterus lahillei.	200000	1997	High
Lenguados	50000	1997	High
Micropogonias furnieri	9100	1997	High
Pagrus pagrus	12000	1998	High
Paralonchurus brasiliensis	1600	1997	High
Parona signata	41000	1998	High
Polyprion americanus	1100	1998	High
Prionotus sp.	1800	1997	High
Sebastes oculatus	37000	1997	High
Seriolella porosa	45000	1997	High
Squatina argentina	40000	1998	High
Trachurus lathami	7300	1997	High
Umbrina canosai	90000	1998	High
Urophycis brasiliensis	800	1998	High
Brevoortia aurea	20000	1997	Medium
Callorhynchus callorhynchus	20000	1997	Medium
Cynoscion striatus	156000	1998	Medium
Genypterus blacodes	170000	1998	Medium
High Seas Rays	360000	1997	Medium
Macrodon ancylodon	5100	1997	Medium
Mustelus schmitti	130000	1998	Medium
Percophis brasiliensis	63000	1998	Medium
Pseudopercis semifasciata	5500	1997	Medium
Squalus sp.	277000	1997	Medium
Coastal Rays (Atlantoraja castelnaui, Sympteirygia bonapartii, Rioraja agassizi, Atlantoraja ciclophora, Psammobatis bergi, Sympteirygia acuta)	14856	1998	Low
Congiopodus peruvianus	41000	1997	Low
Cottoperca gobio	16000	1997	Low
Engraulis anchoita (North)	3200000	1996	Low
Engraulis anchoita (South)	1400000	1998	Low
Galeorhinus galeus	37000	1997	Low
Macruronus magellanicus	4572370	1999	Low

<i>Species</i>	<i>Biomass (Metric Tons)</i>	<i>Evaluation Year</i>	<i>Estimated Uncertainty</i>
Merluccius australis	31000	1998	Low
Merluccius hubbsi (North)	141019	1998	Low
Merluccius hubbsi (South)	1179019	1998	Low
Micromesistius australis	500000	1996	Low
Nototenas	88068	1999	Low
Salilota australis	132000	1999	Low
Schroederichthys bivius	81000	1997	Low
Scomber japonicus	185000	1997	Low
Sprattus fuegensis	320000	1996	Low
Stromateus brasiliensis	61000	1997	Low

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