Sustainable Impact Assessment (SIA) of the trade aspects of negotiations for an Association Agreement between the European Communities and Chile (Specific agreement No 1[1])

Final Report (revised), December 2002

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Abbreviations

ALOP	Asociación Latinoamericana de Organizaciones de Promoción
APEC	Asia Pacific Economic Cooperation
APC	Australian Productivity Commission
ATC	Agreement on Textiles and Clothing
BSE	Bovine Spongiform Encephalopathy
BOD	Biological oxygen demand
BOP	Balance of Payments
CAP	Common Agricultural Policy
CASEN	Ecuesta de Caracterización Socioeconómica Nacional (*National Socio-Economic Survey of Chile*)
CEPAL	Comisión Económica para América Latina
CES	Constant Elasticity of Substitution
CET	Common External Tariff
CFC	Chlorofluorocarbons
CGE	Computable General Equilibrium
CIF	Cost Insurance Freight
CIPMA	Centro de Investigacion y Planificacion del Medio Ambiente
Comext	Eurostat database on external trade statistics
CONAMA	Comisión Nacional del Medio Ambiente (*National Environmental Commission*)
COREMA	Comisión Regional de Medio Ambiente (*Regional Environmental Commission*)
CNE	Comisión Nacional de Energía (*National Energy Commission*)
CPC	Central Product Classification (UN Statistics Department)
DG Fisheries	European Commission Directorate General for Fisheries
DG Trade	European Commission Directorate General for Trade
DIRECON	Direccion General de Relaciones Economicas Internacionales
EC	European Communities
ECLAC	Economic Commission for Latin America
EIA	Environmental Impact Assessment
EPA	Economic Partnership Agreement
ESA	European Statistical Accounts
EU	European Union
Eurostat	Statistical Office of the European Communities
FDI	Foreign Direct Investment
FIDH	Fédération Internationale des Ligues des Droits de l'Homme
FOB	Free on Board
FTA	Free Trade Agreement
FTAA	Free Trade Area of the Americas
FTAP	Foreign direct investment and Trade Analysis Project model
FTAP2	Foreign direct investment and Trade Analysis Project model - Version 2
FTMEU	Free Trade Agreement between MERCOSUR and the European Union
GATS	General Agreement on Trade in Services
GATT	General Agreements on Tariffs and Trade

GDP	Gross Domestic Product
GDI	Gender-related Development Index
GTAP	Global Trade Analysis Project model
HDI	Human Development Index
HS	Harmonised System (product classification)
ICAO	International Civil Aviation Organization
ICCA	International Council of Chemical Associations
ICSF	International Collective in Support of Fishworkers
ICT	Information and Communication Technology
IDPM	Institute for Development Policy and Management
IEP	Instituto de Ecología Política de Chile
IIPA	International Intellectual Property Alliance
IISD	International Institute for Sustainable Development
ILO	International Labour Organization
INE	National Statistical Institute of Chile
INFOR	Instituto Forestal de Chile
IPR	Intellectual property rights
ISIC	International Standard Industrial Classification
ITQ	Individual Transferable Quotas
MBI	Market-based instruments
MIDEPLAN	Ministerio de Planificacion et Cooperacion
MERCOSUR	South American Common Market
MFN	Most Favoured Nation
MSITS	Manual on Statistics of International Trade in Services
MSY	Maximum sustainable yield
MST	Movement of Landless Rural Workers
NAFTA	North American Free Trade Agreement
NAMEA	National Accounting Matrix including Environmental Accounts
NGO	Non-Governmental Organization
NOx	Nitrogen oxides: combination of nitric oxide NO & nitrogen dioxide NO_2
ODEPA	Oficina de Estudios y Políticas Agrarias - Ministerio de Agricultura
OECD	Organization for Economic Cooperation and Development
PCs	Personal Computers
PM	Particulate Matter – airborne solid particles & liquid droplets
PM-10	Particulate Matter – 10 micrometers in diameter
PPDA	Plan de Prevención y Descontaminación Atmosférica (*Pollution Prevention and Decontamination Plan*)
PTUS	Plan de Transporte Urbano de Santiago (*Urban Transportation Plan for Santiago*)
RIDES	Research and Resources for Sustainable Development
SAG	Servicio Agrícola y Ganadero, Chile
SEI	Stockholm Environment Institute
SEIA	System of Environmental Impact Assessment
SERNAPESCA	Servicio Nacional de Pesca, Chile
SIA	Sustainable Impact Assessment
SNA	System of National Accounts

SNASPE	Sistema Nacional de Areas Silvestres Protegidas del Estado (*National System of State Protected Wild Areas*)
SPS	Sanitary / Phytosanitary Regulations
TPRM	Trade Policy Review Mechanism
TRIP	Trade Related Intellectual Property
TRS	Total reduced sulphur
TSS	Total suspended solids
UN	United Nations
UNCSD	United Nations Commission on Sustainable Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
URL	Uniform Resource Locator
USDA	United States Department of Agriculture
USITC	United States International Trading Corporation
USTR	United States Trade Representative
VOC	Volatile organic chemical
WIDE	Network Women in Development Europe
WTO	World Trade Organization
WWF	World Wide Foundation

Executive Summary

The Sustainability Impact Assessment (SIA) of the trade aspects of negotiations for an Association Agreement between the European Communities and Chile aims at producing a comprehensive, methodical and targeted analysis of the impacts of the major potential trade measures under discussion between the EU and Chile on sustainable development. Sustainable development may be defined as 'development that meets the needs of our present without compromising the ability of future generations to meet their own needs'[2]. Both Chile and the EU are covered by the study.

The purpose of this Sustainability Impact Assessment is to identify the implications of the trade measures of the EU-Chile Association Agreement[3] for the long-term economic, social and environmental development of both partners to the agreement. The objective of this examination is to optimise the outcome of the trade measures through the definition of measures aimed at mitigating any negative impacts and enhancing any positive repercussions of the trade measures.

Economic Sustainability

The impact of the EU-Chile Association Agreement is expected to reinforce existing economic trends in Chile. The Agreement results in additional economic growth for Chile of not more than a year's normal economic growth. This is the result of increased demand and some economic restructuring in favour of sectors in which Chile has a comparative advantage, such as processed foods, agriculture, wood, pulp and paper and chemicals. There is also some evidence for gains in services, Increased foreign direct investment is expected in the growing sectors. Sectors in which Chile shows a comparative disadvantage are steel, motor vehicles and other machinery. These sectors are expected to lose employment. None of these employment losses are large; there is no evidence for any negative economic sustainability issues in Chile.

While the greatest per person economic gains are realised in Chile, the EU's gains from the EU-Chile trade agreement are larger in absolute value. In the European Union, the increase in value or income is spread thinly over a large number of activities. The expected overall gain in real income is around $ 800 mn and no sector loses appreciably in any country.

The positive economic impact of the agreement on the EU and its wide dispersion mean that no negative social or environmental sustainability impacts are expected in the EU.

In both Chile and the EU, the trade agreement will bring about a combination of an increase in global employment and a reduction in prices relative to wages.

While the net economic gains from the EU-Chile Association Agreement are relatively modest in both Chile and the EU, they are widely distributed across most sectors and are welcome. These changes are expected to happen over the medium to long term.

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[2] Bruntland Report, *Our Common Future*, World Commission for Environment and Development, Oxford University Press, 1987, p 43.

[3] The EU-Chile Trade Agreement was adopted by the Commission on the 03.10.2002. The full text of the Agreement (in English and in French) can be accessed from DG-Trade Website (http://europa.eu.int/comm/trade/bilateral/euchlagr_en.htm). The Spanish version of the text can be accessed from the Chilean ministry of foreign affairs, DIRECON (http://www.direcon.cl/).

Social Sustainability

In Chile, the combination of increases in total employment and a reduction in prices relative to wages as a consequence of the EU-Chile trade agreement will help to increase the standard of living and reduce poverty among the majority of those people who live in urban areas.

On the other hand, there are a number of pre-existing socially unstable issues in Chile that will be affected by the EU-Chile trade agreement, although the trade agreement cannot be said to be the root cause of these situations. In most of these situations, the issues relate to the existence of a dual economy and to difficulties with fair and fully effective regulation or with title to land. These issues relate in particular to agriculture and fisheries.

The overall positive impact on employment does not preclude negative local impacts that might be quite persistent in some circumstances. This is partly, though not wholly, due to sustainability problems that existed before the EU-Chile agreement. Poverty is expected to be reduced by the additional employment but is expected to be made worse in the areas where negative employment outcomes are expected. This applies, among other areas, to the long-run impact on agriculture.

In the area of education, there is no obvious impact of the EU-Chile agreement, direct or indirect. Health indicators might be slightly impacted in certain sectors.

In terms of overall equity, inclusion in the usual economic processes through employment will be an important step for many people. However, existing inequalities in terms of practical rights and access to social and economic opportunities will not be challenged by the impact of the agreement. In some situations, such as small farming, artisanal fishing and forest-based Mapuches, there is a risk that their already precarious situation will be worsened. Women's access to employment, to capital, to land rights on equal terms is not yet universally achieved. While employment in some sectors where women are employed, such as food processing, will increase, no necessary change is created by the agreement to the pre-existing inequalities.

Indigenous peoples suffer from the same existing small farming problems as other people. Forest-using indigenous peoples consider that their lands are being encroached upon by increased commercial forestry, although the increase in forestry is expected to be modest. Depending on the electricity generating strategy chosen by Chile, they may or may not be negatively affected, although such a negative impact is not a necessary consequence of the EU-Chile agreement.

Without the EU-Chile trade agreement, the existing social problems will continue. While the agreement will not help all of these problems, it will bring social benefits to a large part of the urban population. The agreement will also bring opportunities to address some of the pre-existing social problems.

Environmental Sustainability

Environmental sustainability is affected by two opposite effects. Increased industrialisation implies a higher output, and considering that technologies remain the same, this is detrimental to environment. This effect is the scale effect. However, the implementation of new techniques and cleaner technologies may improve the environmental situation. This phenomenon is the technique effect or technical effect. The present study concludes that, in general, the scale effect will outweigh benefits from technique effects for air, water and land quality. Land and water quality are also affected negatively by

agricultural intensification. Concerning these three environmental indicators we also note the potential local seriousness of mine-induced pollution.

Natural resource stocks, notably fishing stocks, depend on the effective implementation of appropriate management techniques.

In forestry, the environmental impact of the EU-Chile trade agreement on land quality is either uncertain or even possibly positive. However, most of the output of this sector is used as intermediate consumption of export-oriented manufacturing industries, for which the scale effect is likely to provoke increasing environmental pressures, i.e. threats to environment. Thanks to expected new investment, the technique effect should nonetheless be able to balance, at least partially, the scale effect.

As concerns the mining industry, although improved techniques resulting from new investment are expected to have a positive effect, they are not expected to counteract the negative environmental impact on land, air and especially water indicators resulting from increased scale of production.

Chemical and non-ferrous metals industries are heavily involved in the pressure placed on the environment, but companies are increasingly aware of the problem. However, despite voluntary engagements and new regulations, the environmental scale effect resulting from the EU-Chile agreement is likely to outweigh the expected technique effect.

Growth in electricity production, in land transport activities, in tourism and in urbanisation generally are directly linked to growth in overall economic activity. Positive economic effects expected from the EU-Chile agreement are considered to translate into greater environmental pressure through these sectors. Also, here again, the technique effect is rather unlikely to be able to cancel the scale effect, especially concerning transport. Since the main environmental issue related to electricity production consists of air emissions, improvement could come from the use of gas instead of coal. At a cost in terms of impact on bio-diversity, air pollution can be improved by producing hydro-power electricity.

Biodiversity (i.e. fauna habitat diversity, and fauna and flora species diversity) can be influenced by the electricity strategy chosen; a strategy that may cause such impacts is therefore not a necessary consequence of the EU-Chile trade agreement. Bio-diversity may also be affected by tourism.

The major sustainability issues that affect the agricultural sector concern the intensification of commercial agriculture. This trend is not fundamentally caused by the EU-Chile trade agreement but the agreement adds to its effects. The consequences of the trade agreement clearly interact with existing trends to cause possible sustainability impacts.

The environmental consequences of increased intensification of agriculture include potential sustainability impacts involving salinisation, increases chemical residues and erosion of the soil, although increased concentration of commercial farms and/or better management might have the opposite effect on erosion.

In the fishing industry, existing environmental threats come from over-fishing and from the environmental impacts of low-technology operators.

Past mechanisation led to increased pressure on fish stocks. In recent years, efforts have been made to improve regulation and current market based proposals aim at doing this further. If the measures that have been and are being taken to protect fish stocks are effective, then the EU-Chile trade agreement will indeed have no impact on fish stocks. If, on the other hand, a failure of the regulatory system were to occur, then the increased demand brought about by the tariff reductions might increase the incentive to

fishermen to evade the quotas. The competitive pressures brought about by increased investment in the industry, either by domestic or EU owners, might have a similar effect.

Mitigation and Enhancement

The overall economic impact of the EU-Chile Association agreement will benefit Chile by reinforcing existing economic growth trends. But at the same time, pre-existing social and environmental issues might require additional flanking measures to ensure that the people of Chile enjoy the full benefits of the agreement.

Most if not all of the sustainability issues have been experienced in Chile for quite some time. Great efforts have been made to improve environmental quality. Because of this, especially concerning environmental sustainability, many of the structures for the mitigating (flanking) measures required already exist. In the cases where a consensus exists, there is usually a fully effective regulatory body.

As the sustainability impacts are closely related to existing effects, the mitigating measures must address the underlying situations.

The role of the EU in acting to mitigate the negative sustainability consequences of the EU-Chile agreement could therefore generally be seen as a participant and supporter of efforts already under way; as a source of support where new resources are required for research; and as a partner in a two-way EU-Chile mutual education dialogue in those situations where a consensus is still to be built within Chile.

To this aim, Corporate Social Responsibility (CSR) initiatives[4] can play a major role in supporting the efforts of stakeholders and flanking measures of the Parties. By committing to reach high levels of environmental and social behaviours, the companies, foreign and domestic, will help supporting the efforts of governments, and thus maximise the benefits of the Agreement, while minimising its negative impacts. Moreover, dialogue between stakeholders, at national and local levels, will help reaching better understandings on their respective concerns and objectives.

CSR issues should therefore constitute an integral part of the implementation of the Agreement.

The objective of technology transfer as a mitigating action is to provide the technical means to reduce various forms of pollution that would otherwise result from increased production from the EU-Chile trade agreement. The sectors where such an action could prove useful include mining and metals, food processing including fish processing, chemicals, and pulp and paper.

Mitigation and Enhancement: sector level

Mitigation in the ***Fisheries*** sector needs to include measures that aim to achieve overall sector sustainability covering both the existing situation and the trade agreement. More resources need to be devoted to assess the environmental threats of over-fishing. This will require data collection and analysis of the stock size, reproduction, and interactions between different species, particularly for those species native mainly to Chilean waters. Measures should also be taken to ensure that the European investment in the Chilean fishing fleet is an investment in the sustainability of Chilean fishing

[4] The parties to the Agreement have already taken commitments in that direction, since a Joint Declaration states that: "The Community and its Member States and Chile jointly remind their multinational enterprises of their recommendation to observe the OECD Guidelines for Multinational Enterprises, wherever they operate."

reserves. Finally, the artisanal fishing community needs to be empowered and financed to participate in the management of fishing resources and to face the serious challenges that face them. This requires access to alternative sources of employment, either within the fishing industry as a whole or in other sectors.

For ***Grains and Other agriculture***, flanking measures that address environmental problems should comprise improved enforcement of current norms related to pesticides pollution; a re-evaluation of programmes aimed at controlling and reversing soil degradation; targeted efforts towards promotion of environmental production methods and social conservation. The objective of mitigating the effects of agricultural intensification on small farming communities should aim at ensuring that their existing assets and skills are valued and by opening new opportunities. One measure could take the form of helping them to establish their land title where this is lacking. Another one could consist in enabling small farmers to have access to markets and finance. Further flanking measures should address the acquisition of new skills.

In the ***Mining and Chemicals*** sectors, there is a need for consistent application and policing of industry best practice in environmental regulation. This is especially important where local inhabitants' water supplies may be affected. Technological transfer can play a key role in this sense, as it may allow Chilean industries to access cleaner technologies at a reasonable price.

Mitigation measures in the ***Processed Food*** sector should aim at consistent application and policing of industry best practice in environmental and sanitary / phytosanitary regulations. Support for implementing these measures, especially to enable smaller producers to be able to export, could be considered as appropriate flanking measures in these sectors.

Turning to the ***Electricity*** sector, a possible mitigating measure might include support for demand side management, in particular promotion of energy efficiency, which could lead to lowering costs for some industries.

In the ***Transport*** sector, exchange of experience between the EU and Chile in the area of urban transport-related environmental problems could be supported. This approach could be used more widely for urbanisation-related issues.

The impact of the trade agreement will only have a small impact on the output growth for ***Forestry and Wood, Pulp and Paper***. However mitigation measures are needed because sustainability may be affected by this small growth. Since any additional impacts are similar to existing effects, mitigation measures need to address existing issues. Mitigation measures should concentrate on generating more information on environmental damage and on the impact of existing policy measures so as to refine policy reform priorities and design better policy instruments. Possible market-based policy instruments that could be examined could include water effluent fees as an approach to enforce water emission standards. The case for native forests being placed under pressure has not been fully made but nor has it been rejected. This could warrant further study.

Flanking measures for ***Tourism*** could include support for adapting and implementing standards for ecological tourism; and support for developing methods of testing and policing waste discharge standards.

Table 22.1 shows the objectives of the main mitigating and enhancement measures discussed, together with the groups who could be involved in any possible activities. Note that only the intended beneficiaries and their negotiating partners are shown in the column 'Key Participants'.

Technical Summary

The present study aims at producing a comprehensive, methodical and targeted analysis of the impacts of the major potential trade measures under discussion between the EU and Chile on sustainable development in both countries. Sustainable development may be defined as *"development that meets the needs of our present without compromising the ability of future generations to meet their own needs"*[5].

The purpose of this Sustainability Impact Assessment (SIA) is to identify the implications of the trade measures of EU-Chile Association Agreement[6] on the economic, social and environmental situation of both partners. The objective of this examination is to optimise the outcome of the trade measures, with the definition of flanking measures aimed at mitigating any negative impact and enhancing any positive repercussions of the trade measures.

Methodology

The Sustainability Impact Assessment (SIA) developed in this report aims to identify and describe the cause, the magnitude and the nature of each sustainability impact in a way that can be easily understood and compared with other sustainability impacts, including those in different areas of concern. Each sustainability impact identified needs to be causally linked to the trade measure or measures that are considered to be its origins.

The analysis is carried out in four stages, between which there is some feedback:

1. Define the task and role of the study. This entails a description of the scenarios or possible outcomes of the trade negotiations.
2. Identify the effects to be studied and the methods of analysis. This task includes the screening of the expected outcomes of the trade agreement for possible impacts; and the 'scoping' or definition of the methods to be used to examine the areas of interest in more depth.
3. Assess and compare the main sustainability impacts and analyse the quality of the information available.
4. Develop a response to the sustainability impacts thus identified: the mitigation and enhancement process described above.

These four stages represent decision points along the path of identifying the causal chain or process of how a potential sustainability impact may arise. Between these points, the study applies a variety of analysis techniques, both quantitative and qualitative.

The main analytic tool used to identify the effects to be studied is a Computable General Equilibrium (CGE) framework. This produces a simulation of the long-term effects on the economy as a whole and at detailed sector level of a 'trade agreement scenario', which is based on the implementation of the trade-related measures of the EU-Chile Association Agreement or 'trade

[5] Bruntland Report, *Our Common Future*, World Commission for Environment and Development, Oxford University Press, 1987, p 43.

[6] The EU-Chile Trade Agreement was adopted by the Commission on the 03.10.2002. The full text of the Agreement (in English and in French) can be accessed from DG-Trade Website (http://europa.eu.int/comm/trade/bilateral/euchlagr_en.htm). The Spanish version of the text can be accessed from the Chilean ministry of foreign affairs, DIRECON (http://www.direcon.cl/).

agreement'. This is compared with a 'base-line scenario', which describes the situation in which there is no trade agreement between the EU and Chile. It is possible to compare a wider range of scenarios but in this case only these two were required, as the trade negotiations were already advanced at the time the SIA was commissioned. The selection of sectors or areas of interest for further study is made using the results of the CGE simulation as well and other economic, social and environmental information, largely drawn from previous case studies. This selection or screening is made using a set of rules or criteria that seek to identify general situations in which a sustainability impact might occur. Only limited information is required at this stage to ensure that potential sustainability issues are not excluded. Nevertheless, a prioritisation or selection of issues to be examined takes place.

The methods used in the subsequent more detailed studies are chosen to produce an assessment of the specific potential sustainability impact under examination. Both quantitative and qualitative methods are used; and information and analysis is collected and discussed with national and international sector experts with differing viewpoints.

The final assessment summarises and compares the full impact of the trade agreement. This is done through causal chain analysis. Causal chain analysis aims at identifying the significant cause-effect links between a proposed trade measure and its consequent economic, social and environmental impacts.

The comparison of the sustainability impacts is established on the basis of sustainability indicators. These indicators cover the economic, social and environmental fields. The impact of the trade agreement is assessed for each indicator in relation with several significance criteria: magnitude, pre-existing situation, equity, reversibility and capacity to change. Particular issues paid attention to include economic growth, natural resources stocks, pollution, equity, gender and indigenous people issues.

Following the assessment of sustainability impacts, 'mitigating and enhancement' (otherwise known as 'flanking') measures are discussed and proposed. These are activities that could be undertaken to counteract or mitigate a negative sustainability impact or to enhance a positive sustainability impact.

The input of the Commission and of civil society representatives is important in providing information, especially about trade measures and about existing sustainability issues, throughout the study.

Results

Global preliminary SIA and selection of in-depth sector studies

The global preliminary SIA led to the selection of twelve sectors of the Chilean economy, for which the potential for a sustainability impact was identified. An in-depth examination was carried out for each of these sectors. This concerns four primary sectors: Grains, Other Agriculture, Forestry and Fishing, six manufacturing sectors: Wood Pulp and Paper, Processed Foods, Chemicals, Non Ferrous Metals, Mining and Electricity. The development of services activities, in particular Transport and Tourism, were also examined.
Another area examined was the consequences of the Association Agreement on foreign direct investments (FDI) and intellectual property rights (IPR).
According to the global preliminary SIA, the impact of the trade agreement on EU will be small in percentage terms. However, to ensure that no member state will individually undergo significant changes related to the agreement, a sector study was undertaken to measure the impact of the trade agreement on the EU member States' trade at sector level.

Sector studies

While the net economic gains from the EU-Chile Association Agreement are relatively modest in both Chile and the EU, they are widely distributed across most sectors and are welcome. These changes are expected to happen over the medium to long term. On the other hand, there are a number of pre-existing socially unstable issues in Chile that will be affected by the EU-Chile trade agreement, although the trade agreement cannot be said to be the root cause of these situations.

The sectors where the sustainability impacts have been most noted are those where there is competition for non-marketed resources: *Fishing* and *Agriculture*.

The sector study concerning ***Grains and Other Agriculture*** concludes that the EU-Chile trade agreement will have positive outcomes for real income and net fixed capital formation. The medium term growth of sector employment would not preclude a longer-term rise of unemployment for small-scale farmers. There are potential sustainability issues concerning poverty, including for the Mapuche people. Potential sustainability issues associated with increased intensification cover salinisation, soil erosion, use of pesticides and worker health problems.

Examination of the trade agreement on the ***Forestry and Wood, Pulp and Paper*** sector suggests that it will have limited impacts. Economic indicators, employment, real income and net fixed capital formation, are expected to be slightly enhanced. However there are potential sustainability issues from sector growth concerning possible encroachment on native forests, water pollution through liquid effluents, air pollution and odours. Mapuche people may suffer from the possible encroachment on native forests, which are their means of survival.

Output growth of the ***Processed Food*** sector due to the trade agreement will have a positive impact on employment, real income and net fixed capital formation, but its effects on the environmental situation is ambiguous. On the one hand, the increase in production could increase pollution. On the other hand, improvements in the phytosanitary conditions and the implementation of new technologies counteract this effect.

The ***Chemicals*** sector is expected to benefit from the trade agreement in economic terms: employment, real income, net fixed capital formation and consumer benefits. As with the previous sector, a negative environmental impact is expected from the output growth of Chemicals, counteracted to an extent by improved technology.

The impact of the trade agreement on the ***Non Ferrous and Mining*** sectors is expected to improve sector real income and net fixed capital formation. Although somewhat uncertain, employment could increase. The environmental situation is in some cases already seriously damaged by this sector. While improvement is expected from new technology incorporated into sector investment, the net environmental impact is still expected to be negative. A further consequence of increased air and water pollution may include health issues.

Turning to ***Fisheries***, the sector study concludes that the EU-Chile Trade Agreement will have a beneficial effect on sector growth and overall employment. Loss of artisanal fishering employment at local level is a trend that is expected to occur without the EU-Chile agreement. However, the agreement may further this local employment loss, at the same time as bringing about an overall increase in sector employment. There are existing environmental sustainability threats from over-fishing and from the environmental impacts of both low-technology operators, both in fishing,

which produces water pollution and in fish processing, which produces air and water pollution. Avoidance of a negative impact of the EU-Chile agreement on fish stocks is dependent on effective regulation of fishing catches.

If the aquaculture sector exempt from quotas is going to grow as a consequence of the EU-Chile agreement, there may be a risk in salmon farming of damage to the local marine environment, partly from pesticides pollution.

The preliminary global SIA also shows that the output of the ***Electricity*** sector will be stimulated by the trade agreement. Positive economic repercussions on sectoral real income and net fixed capital formation are expected. The growth of this sector may be met by various sources of supply, which have very different potential impacts on social and environmental sustainability. The EU-Chile trade agreement impact on sustainability is therefore uncertain. There is no causal link between the EU-Chile trade agreement and any specific method of generating electricity. Coal plants are the most polluting ones, generating air pollution, acid rains and corrosion on buildings. Natural gas thermal plants, although much less polluting than other fuels, can still have local impacts that cannot be disregarded. Hydroelectric plants constitute the least polluting solution, but may damage natural forests. They could have negative social repercussions regarding the indigenous population living in native forests

The ***Transport*** sector's output, employment and net fixed capital formation are expected to be stimulated by the trade agreement. This will have an environmental cost, since additional air pollution is associated with the development of transport activities. This may have negative consequences on health.

Existing of ***Tourism*** activities are centred mainly in four regions: the Urban Region of Santiago, Valparaíso, the region of the Lakes and Araucanía. All effects in this sector are expected to be limited in magnitude. The sector is likely to have a slightly positive economic impact on real income, employment and net fixed capital formation. Gender disparities may be reduced because the tourism sector mostly employs women. However, unless there is careful management, there is a potential for the development of tourism activities in the Araucanía region to have a negative impact on native forest and so be detrimental to the Mapuche people. Furthermore, tourism growth may add slightly to existing threat to marine and forest biodiversity There may be an environmental cost linked to increased water pollution.

The EU-Chile trade agreement is expected to have a positive effect on ***Foreign Direct Investment*** *(FDI)* in the Chilean economy. Production (primary and manufacturing) sectors that can be identified as likely to attract FDI include Mining, Non-Ferrous metals, Fisheries, Processed foods and Chemicals. Most services sectors of the Chilean economy can be expected to have an increase of FDI. The main target sectors for EU-based FDI into Chile are expected to be Wholesale & retail distribution, Express carriers, Telecommunications, Banking services and securities markets, Insurance services, Computer services, Other business services, Energy and environmental services, Travel / Tourism. In addition, increased FDI from non EU-based companies is also expected to occur in Construction, and Health and Education services. It is also possible that, to a much lesser extent, a limited increase in FDI will occur in sectors that are not expected to grow as a consequence of the agreement but are expected to become more internationally integrated. Such sectors include refineries and possibly steel, motor vehicles and electronics.

Turning to ***Intellectual Property Rights****(IPR)*, even if the income from Royalties and licenses earned by Chilean people are likely to increase at a

result of the trade agreement, one has to conclude that the terms of trade on this Balance of payments (BOP) account will turn against Chile as they update their IPR laws and carry out effective enforcement.

Concerning the impact of the trade agreement on the EU, the sector study concludes that the trade agreement will not generate significant changes of the Member States' sectoral trade. The EU-Chile trade agreement is expected to lead to $ 800 million in additional income for the EU without causing any serious disruption at sector level. This implies that no major changes of sectoral employment are expected.

1. Objective of study

The present study aims to produce a comprehensive, methodical and targeted analysis of the impacts of the major potential trade measures under discussion between the EU and Chile on economic, social and environmental sustainability. Parallel negotiations between the EU and MERCOSUR will be considered in subsequent studies within the present project.

One widely accepted definition of sustainable development is as follows.

> 'Development is a multidimensional undertaking to achieve a higher quality of life for all people. Economic development, social development and environmental protection are interdependent and mutually reinforcing components of sustainable development.'
>
> *UN Agenda for Development, 1997, p1.*

The terms of reference for this study are attached at Annex 1. The study's objectives are:

1. To provide a better basis than has existed to date for EC institutions to ensure that ongoing negotiations take the sustainable development dimension fully into account, and to provide an evaluation of the outcome of the negotiations based on a Sustainable Impact Assessment (SIA) when the time comes to present them for formal adoption.
2. To provide inputs to the definition of a full package of policies at EU level and in the domestic context of trade partners, which will produce the optimal outcome in terms not only of trade liberalisation and economic growth but also of other components of sustainable development (and not to assess the desirability of trade liberalisation as such)
3. To create a basis for the discussion with European stakeholders about sustainability implications of the negotiations.

The following is a description of the activities that are being carried out to fulfil these objectives.

1.1 Global preliminary SIA

This consists of an overview analysis of the potential impacts on sustainability (in the EU and Chile) of the proposed trade-related measures, based on an assessment of developments in the economic partnership negotiations for the proposed association agreement between the European Community and Chile.

The purpose of this exercise is to help the Commission to identify any potential negative and positive impacts of the agreement. The main output will comprise an assessment of those areas where the study considers that more detailed assessments should be carried out.

This analysis should cover both market access and – to the extent possible - rules-related aspects, highlighting the potential positive and negative effects on sustainability as well as the possible flanking measures.

The study will quantitatively assess the potential economic impact of the EU-Chile trade agreement. It will also analyse the potential impact of the proposed measures on social and environmental issues. This analysis should as far as possible combine qualitative and quantitative approaches.

The study proposes and designs two scenarios for the assessment process:

i) a baseline scenario, without agreement

ii) a scenario with trade agreement;

The study will fine tune the methodology and the approach to the specificity and timing of the negotiation process.

In order to identify the linkage between the proposed changes in trade measures and the potential social, environmental and economic impacts, the consultant will develop the understanding of the **causal chains** (further explained in Section 4.4) which identify the significant cause-effect linkages.

1.2 Study of specific sectors

Following the Global Preliminary SIA, sector studies are carried out to assess the impact of the trade agreement on economic, social and environmental sustainability and in particular on growth, natural resources stocks, pollution, and on social issues, covering equity, gender and indigenous peoples issues.

In addition to the key sectors of fisheries, mining and forestry that have been previously identified, other sectors identified by the above work and through external consultation will be prioritised and analysed.

This work includes:

- Quantitative and qualitative assessments of the impact of the trade measures on the sector concerned. This work should be undertaken on the basis of case studies and economic, social and environmental (including environmental impact assessment(s)) analysis. The work undertaken in the past by organizations such as WWF and UNEP needs to be fully integrated in the assessment process.
- Suggestions on what flanking measures might be introduced to best maximise the positive impact of further liberalisation / changes in rule-making. This should include an assessment of the various options for mitigating and enhancing measures, including those which could be introduced in other international fora, or in other areas of the ongoing negotiation processes.

1.3 Final synthesis

The final synthesis summarises and compares the full impact of the trade agreement. This is done through causal chain analysis. Causal chain analysis aims at identifying the significant cause-effect links between a proposed trade measure and its consequent economic, social and environmental impacts.

The comparison of the sustainability impacts is established on the basis of sustainability indicators. These indicators cover the economic, social and environmental fields. The impact of the trade agreement is assessed for each indicator in relation with several significance criteria: magnitude, pre-existing situation, equity, reversibility and capacity to change. Particular issues paid attention to include economic growth, natural resources stocks, pollution, equity, gender and indigenous people issues.

Following the assessment of sustainability impacts, ‘mitigating and enhancement’ (otherwise known as ‘flanking’) measures are discussed and proposed. These are activities that could be undertaken to counteract or mitigate a negative sustainability impact or to enhance a positive sustainability impact.

The input of the Commission and of civil society representatives is important in providing information, especially about trade measures and about existing sustainability issues, throughout the study.

1.4 Content of the report

The study covers the final agreement reached between the parties to negotiations prior to its adoption in the Council and discussion in the Parliament and with civil society.

The EU-Chile SIA study has been the subject of three reports: Inception, Midterm and Final (the present document).

This Final Report covers the following elements:

1. The present summary of the approach to the study and the activities being carried out
2. A description of the methodology used, including a presentation of the conceptual framework of the sustainability assessment analysis and developments or changes from past studies. This description also includes an analysis of the methods used to ensure that the study is comprehensive and that the causal chain analysis is used appropriately. This methodological study includes a discussion of evaluation themes and indicators and the representation of results.
3. An analysis of the trade-related measures incorporated in the EU-Chile economic Partnership Agreement and a macroeconomic analysis of its long-term economic impacts. The macroeconomic analysis is performed using a computable general equilibrium economic model, the use of which is described. These two exercises are aimed at providing information to be used as inputs into the screening exercise for the key sustainability issues and the impacts associated with the trade agreement.
4. A screening / scoping exercise based on the results of the previous exercises and on other information, which results in the selection of sectors and areas for more detailed study. This analysis includes the first use of macro and sector specific indicators.
5. More detailed studies which analyse potential social and environmental sustainability impacts in the areas and sectors identified by the screening / scoping exercise. The outcome of these studies is an initial assessment of the sustainability impacts in their areas.
6. An assessment of the social, environmental and economic sustainability impacts at macro and sector levels. This assessment includes an analysis of missing and conflicting information and concludes with an analysis of potential ameliorating (flanking) measures.
7. A description of contacts with identified civil society representatives and information on progress in developing the study Website.
8. A record of the comments made by the Commission on the Inception and Midterm Reports and discussion as to how these comments have been responded to in the present report.
9. A review of the literature, and list of tools and references.

As indicated in the terms of reference, the methodology to be used for this SIA is based on the reports of Phases One to Three of the Sustainability

Impact Analysis of proposed WTO negotiations[7]. These reports provide a framework for the development of an SIA. In developing our methodological approach from this basis, we have paid attention to the European Commission's civil society consultation paper *Key Issues raised in discussions with Member States and representatives of Civil Society*[8], as well as to the wider debate, especially that within the United Nations family[9].

[7] Kirkpatrick, Lee and Morrissey, 1999a and 1999b and Kirkpatrick and Lee, 2002.

[8] European Commission, 2000.

[9] UN / UNEP, 2001, Reference Manual for the Integrated Assessment of Trade-Related Policies, UN / UNEP, New York / Geneva.

A. Methodology

2. Summary of Methodology

The SIA methodology aims to produce a comprehensive assessment of the impacts on economic, social and environmental sustainability that can potentially result directly or indirectly from a trade agreement or other policy change under consideration.

The magnitude and nature of each sustainability impact needs to be described in a way that can be easily understood and compared with other sustainability impacts, including with sustainability impacts in different areas of concern.

The final assessment summarises and compares the full impact of the trade agreement. This is done by examining the now complete 'causal chains' that each describe how specific trade measures affect the economy, in turn causing a chain of responses which can result in an impact on economic, social or environmental sustainability.

The main decision points of a sustainability impact analysis can be summarised as the following stages, shown in Table 2.1.

Table 2.1: Main Stages in Sustainability Impact Analysis

	Stage	Task
1	Definition of study task and role	Description of scenarios
2	Identification of effects to be studied and methods of analysis	Screening and scoping
3	Assessment of main sustainability impacts	Assessment and comparison of uncertain information
4	Response to identified sustainability impacts	Mitigation and Enhancement
5	Monitoring and evaluation	Of sustainability impacts / mitigation & enhancement measures

In more detail, these stages can be described as follows:

1. A full description of the trade agreement or other policy change for which the Sustainability Impact Appraisal is needed. The first stage is therefore to define the baseline and 'policy change' or 'trade agreement' scenarios to be considered. There may be more than one variation on the scenarios to be considered.
2. A comprehensive Screening of the initial effects of the trade agreement to determine which areas potentially contain sustainability impacts; and Scoping, to establish the appropriate coverage and methods to be used for each of these more detailed analyses.
3. An assessment of the results of these detailed studies to determine whether any constitute a significant impact on a comparable and comprehensive set of indicators of economic, social and environmental sustainability. The magnitude and nature of these sustainability impacts are described. A comparison and evaluation of uncertain and conflicting information is undertaken.
4. An analysis of possible and beneficial activities that can be undertaken to mitigate any negative and enhance any positive sustainability impacts.

5. Monitoring and evaluation of the sustainability impacts and the mitigation & enhancement measures. This stage is subsequent to the study.

Since the full contents of the Trade Agreement cannot be made available to an ex-ante SIA, the trade measures were estimated on the basis of discussions with the European Commission, published documents and previous trade agreements. A macroeconomic model was then used to inform the Screening process. The actual Screening compares the initial economic impact of the Trade Agreement with a set of Screening criteria that are designed to comprehensively identify possible economic sustainability impacts or potential causes of indirect social or environmental sustainability impacts. Following the definition of the detailed studies to yield the information required for the sustainability impact assessment (the scoping exercise), the detailed studies complete any missing information about the precise trade measures that are causally linked to the areas under study. The full information is therefore available to the sustainable impact assessment.

Decision points and information required for decision

Each stage of the analysis terminates with a decision: an identification of areas for analysis, a selection of methods, an assessment of significance and an evaluation of actions. The following list illustrates the information required at each decision point.

1. Possible measures for negotiation. Possible scenarios to be analysed for each measure; Country groups for which appraisals are to be undertaken. Role of the study.
2. Screening criteria for selection of sectors / areas for further study. Threshold values for numeric criteria. Scoping: Methods, consultation procedures and information sources to be used in detailed studies.
3. Sustainability impact indicators and significance criteria to be used in the appraisals. Methods to be used to decide between information conflicts.
4. Opportunities and benefits to take actions that ameliorate and mitigate sustainability impacts.

3. Stage 1: Development of Scenarios

Initial scenario development

The task for which the Sustainable Impact Assessment (SIA) is required is the study of a trade agreement or other policy change that is thought to have the potential for economic, social or environmental consequences that are external to the direct effects of the trade agreement.

The following 'dimensions' together fully describe how the study is related to and how it covers the trade agreement or other policy change:

- The 'baseline' situation or scenario, in which the trade agreement does not come about.
- The possible formulations, combinations and extent of trade measures that make up the scenario(s) that are alternatives to the baseline.
- The geographical coverage of the study.
- The role of the study.

The 'baseline' and 'policy change' or 'trade measure' scenarios together describe the questions covered by the analysis. The geographical coverage describes its physical scope while the role of the study describes the relationship that the study has with the parties to the trade agreement or policy change[10].

The sustainability impact analysis is based on comparing various possible scenarios for the trade agreement and their different outcomes. There are two issues that arise from this approach. Firstly, the precise trade measures cannot be known at the time that the SIA is carried out. Secondly, the isolation of the trade agreement from other events for the purposes of study needs itself to be critically examined.

The precise changes to tariffs and tariff-quotas, market access and rules-related measures that make up a trade agreement are confidential to the trade negotiations. On the other hand, the overall framework, the objectives and the coverage of the trade negotiations are publicly available information. Full information about the trade agreement is therefore usually absent at the time of development of the scenarios; in the present study, this information became available at a later date.

In order to overcome this lack of information, the study could develop a number of variation scenarios on the trade agreement or it could attempt to estimate the contents of the trade agreement. The study objectives and the time and analysis tools available to the study are the factors that should influence the choice of which route to take. This is because the analytic tools available have different levels of sensitivity to variations in trade measure formulation. For example, a detailed study of a specific sector or impact will probably be more sensitive to how a trade measure is formulated than a computable general equilibrium macroeconomic model will be.

In order to maximise the benefits of the different analysis tools, a two-stage procedure has been used. In the first stage, an estimated version of the trade agreement is used together with a screening tool such as a macroeconomic model. In a second post-screening stage that concentrates on specific sectors or subjects of interest, either different formulations of specific trade measures could be used or else more detailed information about the trade measures could be obtained from interested parties.

[10] See UN / UNEP, *Reference Manual for the Integrated Assessment of Trade-Related Policies,* 2001.

In the present study, a two-stage procedure has been used and the final EU-Chile trade agreement became available during the second stage analysis.

We now examine the question of whether the impact of a trade agreement can be accurately analysed in isolation from other events. This question arises because the 'baseline' scenario contains the assumption that previous trade agreements have already been implemented, whereas trade agreements may not in fact be implemented in the order that they were analysed. The order in which trade measures are implemented can have an effect on the final outcome. Moreover, sustainability impacts could arise from the interaction of two trade measures in two different agreements, in which case the impact could be wrongly ascribed to the second trade agreement studied alone.

The solution lies in the correct specification of the scenarios to capture the potential for interaction between the two sets of policy changes. If there is thought to be a possibility of interaction between measures in two trade agreements, this must be explicitly analysed.

A further consideration in describing the trade agreement scenario(s) is the need to avoid hiding potential impacts within large heterogeneous sectors.

The output of this stage of analysis is a full description of the baseline and the alternative scenario(s) consisting of the trade measures to be studied, including if required scenarios that contain alternative formulations of the trade measures. Any potential interaction between the baseline scenario and other relevant events should be noted.

4. Stage 2: Screening and Scoping

4.1 Screening overview

The purpose of screening is to identify those trade measures as they affect sectors or issues that are considered to be worth examining further. This more detailed examination aims to find if there is a potential causal link from one or more trade measures through the sector or issue identified to a sustainability impact.

The information available to the screening process consists of the macroeconomic and sector projections that are the output of economic simulations of the baseline and 'trade agreement' scenarios. In addition, other past economic data should be available as well as knowledge of previous sustainability impact case studies and general knowledge of production processes and their links with social relations and the environment.

The screening process asks, in each economic sector and for the economy as a whole, if the economic changes that result from the trade measures that make up the trade agreement or other policy change, may be evidence that there are potential consequences for economic, social or environmental sustainability. In order to avoid missing any sustainability impacts, only limited evidence is required for an issue to be identified as being worth further study. The economic basis for screening is adopted because the initial changes derived from the trade measures are (mostly) economic; and because the economic classification provides a comprehensive coverage of all economic activities.

4.2 From Scenarios to Screening

Once the scenarios have been defined, the next stage is to develop the information necessary for the screening process.

The primary information required is an analysis of the long-term macroeconomic and sector economic impacts of the trade agreement or other policy change.

This is not because economic issues are privileged or are considered more important than other sustainability impacts in any way.

It is because any sustainability impact can only come about if there is an initial economic effect. If a change in tariffs, for example, does not lead to a change in imports, their prices or production of competing domestic products, then there is a break in the causal chain. Thus no consequences, such as a change in social or environmental sustainability, can come about.

One partial exception to this situation occurs when a non-tariff trade measure may directly alter production relationships. In this situation, the initial analysis of the trade measure during the development of the scenarios provides part of the information required for screening. A change in economic behaviour must still occur for a sustainability issue to occur but this may or may not be observable from the macroeconomic analysis and instead must be identified during the screening process. Such a situation can arise when previously reserved sectors are opened to foreign investment, which brings in new production techniques.

4.3 Screening criteria

A sector, activity or issue is identified as being worth further study if there is evidence that one of four criteria or reasons for selection below has been

met. The screening criteria are a first identification of potential sustainability impacts on one or more sustainability indicators that may result from a trade measure or measures that are related to the sector or issue in question. The evidence used to make the screening decision is the available information about the scenario and its economic impact. Taken together, these four screening criteria are intended to provide a full and comprehensive identification of possible sustainability impacts.

These four criteria cover:

1. Direct economic sustainability impacts.
2. Economic impacts that are thought likely to lead to a structural change in production methods that can consequently lead to social or environmental sustainability impacts.
3. Environmental sustainability impacts caused by changes in the scale of production.
4. Known problems with information or initial analysis.

4.3.1 Economic impacts

The first criterion is that a projected economic impact that results from the Trade Agreement or other policy measure is itself likely to constitute an economic sustainability impact.

At macroeconomic level, an economic sustainability impact is interpreted as a rapid increase in output or employment or a decline in output or employment. At sector level, either a large output or employment decline or changes to the structure of sector production might lead to restructuring or 'frictional' unemployment. These employment changes can have poverty implications, especially if they are geographically concentrated and if the areas affected have limited alternative employment either by reason of specialization or existing high unemployment.

In addition, large employment changes in sectors where there is considerable concentration of gender-specific employment will be highlighted.

Screening for direct economic sustainability impacts therefore covers much the same area as the economic assessment but with less information.

4.3.2 Changes in production structure

The second criterion concerns economic evidence for changes to the structure of production methods from which a possible causal link can be made to social or environmental sustainability impacts[11]. A change in production structure here covers changes in the usage of non-market resources as well as changes in non-market socio-economic relationships between people.

If a sector is directly opened to foreign ownership by the trade agreement, it can be identified, even if there is no change in output or employment. This is because new investment[12] may lead to the introduction of different production techniques and so to changes in employment and/or environmental indicators. Similarly, a rules-related measure in the trade agreement that might change the sector's products or methods would be considered here.

Rapid economic growth at sector level can in itself lead to changes in the structure of production.

[11] The relationship between changes in production structure was explored in Maltais, Nilsson and Persson, 2002.

[12] which may not be projected by the model.

If growth, even at fairly low levels, is noted in a sector that competes for non-market resources, such as common lands, it can be identified. Economic growth in sectors where farmers or other producers with land title compete for land with farmers or other producers who do not have land title would similarly cause the sector to be selected.

Finally, if sector economic changes can cause changes in the value of non-market labour, the sector can be identified.

Under the second criterion, the screening process has to hypothesise a causal chain from the economic impact through a change in production methods or relationships to a potential social or environmental sustainability impact.

4.3.3 Direct output link to environmental indicators

The third criterion concerns economic growth that occurs in a sector where there is thought to be a direct link between output and environmental indicators.

This criterion covers sectors that can directly produce pollution as well as other sectors in which growth can lead to pressure on the local environment.

Possible scale, technique and mix effects on pollution output are not considered at this stage but instead are left to the detailed study as determined by the scoping exercise.

For the third criterion, sector growth can be fairly small to have an environmental sustainability impact but a possible prior link has to be established between incremental sector output and its environmental consequences.

4.3.4 Lack of information

The fourth criterion is simply that there is reason to believe that the previous sector economic analysis needs reinforcement.

4.4 Screening and causal chain analysis

Rather than screening for specific trade measures, we are screening the whole trade agreement to find the sectors or areas that are susceptible of having a sustainability impact. The linkage between the precise trade measure and the economic and consequent impacts in those sectors will be detailed later as part of the sector studies.

Causal chain analysis aims at identifying the significant cause-effect links between a specific proposed trade measure and its consequent economic, social and environmental impacts.

The starting point of the casual chain is a specific trade measure. The screening process, however, starts by establishing whether there is an economic impact in the sector or area of interest. If there is no impact on output, no significant impact on employment and no other indication of sector restructuring, then there can be no consequent effects and so the sector is not selected.

If one of the above economic effects occurs, then a causal chain has to be hypothesised to link the economic impact to a sustainability impact. If there is no reason to suspect that there is a consequent change in production methods or relationships and no suspected direct link between sector incremental output and environmental sustainability, then the sector is not selected. However, if an economic impact is noted in a sector, it will usually pass the screening.

If a sector is not selected, it is not yet excluded from further analysis. However, in order for it to be examined further, a cross-sector link now needs to be established with a selected sector. These cross-sector causal

links can occur where two or more sectors share or compete for a non-market resource, such as common land, or where the same individuals deal with each other in different activities, such as a sole local employer-landlord dealing with an employee-tenant.

In sum, the screening process establishes a causal link between the estimated trade agreement and economic consequences. It demonstrates any direct economic sustainability impacts. It hypothesises a causal relationship between the economic consequences and any environmental or social sustainability impacts.

4.5 Scoping

The objective of scoping is to define the methods used in each of the subsequent detailed studies. These detailed sector or issue studies aim to produce an assessment of the specific potential sustainability impact under examination.

The scoping exercise defines the sector or area of study and the methods to be used to test the possible links between specific trade measures and sustainability impacts. This definition must not be set so narrowly as to exclude possible sustainability impacts.

The scoping exercise must frame the study outputs in terms of the sustainability indicators and the assessment criteria.

In this study, the actual trade measures in the EU-trade agreement are available to the detailed studies. In most cases, however, the trade measures to be considered by a detailed study for each scenario must be specified by the scoping process.

The resulting terms of reference for the detailed studies are not identical but instead each reflect the possible sustainability impacts that are being evaluated for the sector or area under study.

If the scoping exercise so indicates, it is quite possible that a detailed study will concentrate on examining a specific sustainability impact. An example might be to exclude environmental issues in order to concentrate on social issues. In particular, if a sector or area is selected for study under the criterion of lack of information, it is possible that the terms of reference for that study will concentrate on producing a corrected economic analysis of the sector in question and not consider either social or environmental questions. In this case, a second screening could occur using the results of the study to determine the scope of a subsequent social or environmental analysis.

Similarly, the results of the detailed studies should, if practicable, be themselves subject to a screening / scoping exercise. This will determine whether any ‘second-round’ sustainability impacts are possible and require studying.

5. Stage 3: Indicators and Assessment

5.1 Overview

The purpose of this activity is to provide a comparable summary of the sustainability impacts and to ensure the comprehensive coverage of all sustainability impacts.

The set of indicators used should provide comprehensive coverage of the potential sustainability impacts in economic, social and environmental terms. Indicators should not overlap in their coverage, so avoiding the possibility that an impact is 'double counted'. However, the practical difficulties of developing a set of indicators (themes) mean that there is an inevitable tension between these two objectives. For ease of analysis, the number of themes should be kept to a minimum, provided that the first two objectives are met. Therefore, only if a trade-related outcome cannot be covered by one of the indicators below should the number be increased.

A constraint on the implementation of the set of indicators, the measures used, is the availability of data, both in describing the situation in a country and in analytic tools. Matching the data used to describe the same phenomenon by two disciplines (e.g. economics and environmental studies) is a particular problem. In general, analysing groups of countries that have not harmonised their data concepts is a further difficulty.

There is also a clear interest in maintaining compatibility between SIA studies.

At the level of the individual measure, the logic of its development needs to be shown: what it represents, what it covers, why it was chosen and its potential weaknesses. The IISD (International Institute for Sustainable Development) work on its 'Compendium of Indicator Initiatives' is relevant here, as is Norström H., Vaughan S, *Trade and Environment*[13].

When presenting the results, the objective is to enable the reader to understand the relative importance attached by the study presenter to each of the impacts discovered. At the same time, spurious relationships between different indicators need to be avoided. There are a number of different dimensions to each impact, such as its seriousness (or indeed joyfulness) to those affected, its incidence, the time suffered or enjoyed and its potential for irreversibility. The different dimensions of the full effects of the trade agreement should in principle be illustrated.

5.2 From Scoping to Assessment: the Detailed Studies

This stage consists of a number of detailed studies of sectors or cross-cutting issues that have been identified by the screening process and for which the scoping process has provided the terms of reference, which includes an outline hypothesis of sustainability impact(s) to be assessed. The information from the macroeconomic analysis that preceded the screening is available to the detailed studies.

Also available to the detailed studies will be the information from the development of scenarios, including the initial estimations of the trade measures. However, it is normally part of the task of the detailed studies to examine the initial estimated trade measures from analysis of the possible formulation of the trade measures in discussion with the various participants in the sector.

[13] Special Issue, n° 4, World Trade Organisation, Geneva, 1999.

The output of the detailed studies is the information required for the sustainability assessment: an analysis of sector statistics and other available information relevant to the detailed study terms of reference; the causal chain that leads from the economic impact and / or the direct effect of the relevant trade measure(s) to the hypothesised sustainability impact under examination; the assessment and its summary; an analysis of conflicting or missing information; and discussions of ameliorating / flanking measures, including the formulation of the trade measures where appropriate.

In other words, the output of the detailed study is a first assessment of the sustainability impacts that are relevant to the detailed study's terms of reference. Depending on the terms of reference, the detailed study may only assess one or two of the areas of economic, social and environmental sustainability. If it is appropriate, parallel detailed studies of the same sector could be undertaken using different methodologies and with different objectives.

5.3 Sustainability Impact Indicators

5.3.1 Overview

Table 5.1 contains a base list of sustainability impact indicators or 'themes' that this study has used. The list was intended to be comprehensive but with as little double counting of sustainability impacts as possible. The point of departure for this list was the previous methodological studies undertaken for the European Commission[14]. We have made a few carefully reasoned changes to this list, largely additions. In making these changes, the study has paid careful attention to the wider debate on development of sustainability indictors. Sources of information include UN / UNEP, *Reference Manual for the Integrated Assessment of Trade-Related Policies,* 2001 and UNCSD, 1999, *Indicators of Sustainable Development: Framework and Methodologies*, which is reproduced at Annex 2.

The core indicators identified in Table 5.1 are used to summarise the sustainability impacts. The secondary indicators are used in these summaries when appropriate. The number of indicators that cover the economic, social and environmental areas may not be equal to each other but they are 'balanced' through the considered use of the primary and secondary indicators.

Table 5.1: Sustainability impact indicators

Area	Core Indicator	Secondary
I. Economic	1. Real income	Net value added; Consumer effects: prices, variety of goods and services
	2. Net fixed capital formation	Private, public capital formation
	3. Employment	Self-employment, informal employment
II. Social	4. Poverty	Income and other social dimensions of poverty
	5. Health and education	Life expectancy; Mortality rates; Nutritional levels, literacy rates; Primary, secondary and tertiary, enrolment rates
III. Environmental	6. Environmental quality	Air, water, and land quality indicators
	7. Biological diversity	Designated eco-systems, endangered species
	8. Other natural resource stocks	Energy resources; Other non-renewable and renewable resources

[14] Main reference: Kirkpatrick and Lee, 2002.

We identify the equity dimension of sustainability issues, and in this way gender issues, in conjunction with the appropriate economic, social and environmental indicators. This approach is explained in detail in Section 5.4 below.

The 'sustainability indicators' should be understood as being generally long-term and dynamic in nature. As with equity issues, the question of the duration of sustainability effects is discussed in Section 5.4 below.

5.3.2 Consumer effects

One departure from the list developed by Kirkpatrick and Lee, 2002 is that we have added 'Consumer effects' to the economic indicators as a secondary indicator. This is intended to capture benefits or disbenefits that accrue to consumers as a group throughout the country being analysed.

In the textbook case, economic benefits accrue to all national partners of a trade agreement[15]. But there is no supposition that economic benefits accrue to all people within the parties to a trade agreement. Economic benefits (or disbenefits) can accrue to producers in the form of increased wages, employment and/or profits. Economic gains can also accrue to consumers in the form of lower prices, increased quality and/or increased variety of goods and services. The Consumer Benefits indicator is usually based on consumer price changes. A decrease in prices implies an improvement in the Consumer Benefits indicator and vice-versa. If there is information about a change in product quality and /or variety as a consequence of the trade agreement, then this can be taken into account in evaluating the indicator. However, prices are the only relevant factor in many sectors and information about quality or variety change is often unavailable.

The introduction of the 'Consumer effects' measures how much better or worse off consumers are in consequence of a trade agreement and seeks to define whether consumers in both parties to the trade agreement will gain from a specific trade measure. It also serves to underline the observation that a large part of the economic effects of a trade agreement are experienced by people whose employment is unaffected by the agreement.

'Consumer effects' are a subset of 'real income' changes, as 'real income' measures all economic gains and losses whether through the production or the consumption side. The introduction of the 'consumer effects' measure thus seeks to identify only that part of real income that changes as a result of consumer market conditions. The remaining gains or losses are thus identified as originating from the production side.

At the least, the 'Consumer effects' indicator may help explain why a measure that has environmental or social sustainability problems may nevertheless enjoy support from other people who are not affected.

5.3.3 Employment

Employment is both an economic and a social phenomenon. We have classified employment impacts under economic changes in the tables, both because an economic model is the primary technique we use to analyse employment changes as a consequence of the trade agreement and also because other studies have classified employment in this way. In the discussions of sustainability impacts, employment generally links the economic and social issues.

5.3.4 Ownership of the process

The themes that come under the heading 'Ownership of the Process': the 'equity of the agreement' and the 'capacity to implement it' refer to the

[15] Provided that it does not lead to greater trade diversion than trade creation.

process through which sustainability issues and potential ameliorating actions are addressed. They therefore relate to processes rather than outcomes. We consider that these themes are very important to the final sustainability impact of a trade agreement, including any 'flanking' actions.

The process of developing regulatory or other legal frameworks, the ability of society to debate such changes and the capacity to improve potential outcomes are all of specific relevance to the current study. The objective behind these indicators is to show the quality of the process through which policies and mitigating and enhancing measures are developed. These indicators are therefore, in principle, important in understanding the development of the initial policy change and how the response to sustainability issues may be developed.

In approaching these issues, we have preferred to discuss them, rather than include them as indicators in the assessment table. This is partly because these indicators are a very recent innovation of the University of Manchester team and the present study has not had sufficient time to fully consider them. In addition, these 'Process' themes/indicators are qualitatively different from the 'Outcome' themes. It is also possible that these issues are covered by dimension / column E: 'Regulatory and institutional capacity to implement ameliorating measures', discussed in section 5.4. We have therefore omitted these themes from the Summary of Sustainability Impacts tables.

5.4 The Dimensions of the Sustainability Impact Indicators

Sustainability changes can impact on the economy, society or the environment in qualitatively different ways. We consider such differences as being the 'dimensions' of a sustainability impact, which provide a fuller description than simply its direction and magnitude. These dimensions are presented in Table 5.2, which, together with Table 5.1, provides the framework to summarise sustainable impacts.

A trade measure or other policy change may lead to more significant consequences if there is a previously existing sustainability issue in the sector or area that is affected. A sustainability impact may be universal or it may affect different groups of people in different ways. In particular, a sustainability issue may have a gender-differentiated impact. A sustainability impact may be reversible or, especially in environmental areas, it may be irreversible. And the capacity to mitigate or ameliorate the impact may or may not exist. Or a policy change may lead to none of these things but still cause a sustainability impact.

These different 'dimensions' examine the different ways in which the sustainability impact affects people and the environment. They modify the overall sustainability impact and so are sufficient but not necessary criteria for the identification of a sustainability impact. For example, a sustainability impact that affects everyone equally will not appear under the 'Equity' dimension but is nevertheless of great importance.

The study team has also examined other possible 'dimensions' of sustainability impacts, notably variations over time and geographically. Geographical variations can be considered as aspects of equity. Sustainability impacts by definition have long-term consequences. If an impact is expected to have a short-term strongly negative effect, followed by a positive one, the short-term negative effect may have sustainability consequences that need to be explicitly covered by the evaluation. Variations over time are therefore not separately considered but instead integrated into other issues.

Sustainability impacts are estimated on the basis of the indicators developed above, which became the rows of Table 5.2. The dimensions or criteria of the sustainability impacts become the columns of Table 5.2, as follows.

A. Overall Direction and Magnitude of change from Baseline to Scenario

The first column of Table 5.2 summarises the 'Overall Direction and Magnitude' of the sustainability impact. This column summarises the most widespread sustainability impact. All sustainability impacts have an 'Overall Direction and Change'. This assessment does not negate the possibility of contradictory effects covered by the same indicator. These are noted in other columns.

The other dimensions of a sustainability impact are often specific to certain types of impact. For example, environmental changes may be irreversible; the same is rarely if ever true of economic changes. Where one or more of these dimensions are important to the assessment of the sustainability impact, they are recorded in Table 5.2. The other columns of Table 5.2 should therefore be seen as modifying the meaning of the 'core' column A. For this reason, column A is visually emphasised.

B. Extent of existing economic, social and environmental stress in affected areas

The pre-existing social, environmental or legal conditions and trend can very often have an impact on the social or environmental consequences of a trade measure or other policy change. Where there are pre-existing issues that may interact with the effects of a trade measure, these are indicated under this column. For example, a negative greater significant impact in this column, accompanied by a negative lesser significant impact in Column A: Overall Direction and Magnitude of Change, can be interpreted as a negative impact, not itself of major proportions, acting on an already serious situation.

C. Equity of change

Contradictory effects may well co-exist for the same sustainability impact: an overall positive impact may nevertheless have an impact that is negative for a group of people. This group may be defined by low income, by gender, by age or by ethnic identification such as indigenous peoples or ethnic minorities. The identification may be simply geographic or be based on an urban/rural divide. In examining the equity of the sustainability impact, this column considers the exceptions or variations to the overall assessment made in Column A: Overall Direction and magnitude of change. An example is an economic change that leads to increased employment opportunities for the majority but which has severe consequences for frictional unemployment for workers in a specific activity, which may be locally concentrated.

A sustainability impact can in practice have a differential impact on a number of different groups. For example, a policy change may be beneficial to consumers and some producers but have a negative (but nevertheless different) impact on ethnic minorities and female producers. Therefore, it is sometimes necessary to identify separately the groups that experience differential sustainability impacts. This is done in the sustainability impact tables by identifying separate equity columns, labelled C.1, C.2, etc.

C.1 Gender impact

In particular, gender differential impacts can be identified when they are linked with economic, social (or conceivably environmental) sustainability impacts. A policy change that has a gender differential impact on a number of sustainability indicators can similarly be identified.

D. Potential for irreversibility

Environmental changes such as ecosystem loss may be irreversible. Some social changes may similarly be so.

A change is either irreversible or not; or insufficient information may be available.

E. Regulatory and institutional capacity to implement ameliorating measures

A potentially negative sustainability impact may be susceptible to being helped by ameliorating / flanking measures that can be implemented in practice. Conversely, the benefits of the potentially positive sustainability impact could be put at risk by issues concerning institutional capacity to implement the necessary measures to ensure that the benefits reach the people concerned.

Table 5.2: Summary of sustainability impacts

	Dimensions / Significance Criteria					
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C	Equity: Gender issues C.1	Revers-ibility D	Capacity to change E
I Economic						
1. Real income						
2. Net fixed capital formation						
3. Employment						
4. Consumer effects						
II Social						
5. Poverty						
6. Health and education						
III Environmental						
7. Environmental quality						
8. Biological diversity						
9. Other natural resource stocks						

Columns A – E

A. Overall direction and magnitude of change from baseline to scenario

B. Extent of existing economic, social and environmental stress in affected areas

C. Equity of change: how it affects different sectors of the population

D. Potential for irreversibility

E. Regulatory and institutional capacity to implement ameliorating measures

Column A is always completed. The other columns are completed as required to describe the sustainability impact.

5.5 The Scale of the Sustainability Impact Indicators

Sustainability impacts may be positive or negative and the scale of their impact may be estimated with some accuracy or only roughly. It is important that the study does not pretend that it has greater accuracy than is available. At the same time it is necessary to use the same comparable scale across very different types of sustainability impacts.

The scale[16] presented below and which is used to complete Table 5.2 measures the direction and magnitude of a sustainability impact that concerns a theme / indicator (row) in terms of one or more dimensions / criteria (columns).

The symbols used are intended to convey the information available, direction and magnitude of a sustainability impact.

Symbols:

- ○ non-significant impact compared with the base situation
- △ positive lesser significant impact (marginally significant, by itself, to the negotiation decision)
- ▽ negative lesser significant impact. (marginally significant, by itself, to the negotiation decision but a potential candidate for mitigation)
- ▲ positive greater significant impact (likely to be significant, by itself, to the negotiation decision)
- ▼ negative greater significant impact. (likely to be significant, by itself, to the negotiation decision. Merits serious consideration for mitigation)
- ↕ positive and negative impacts likely to be experienced according to context
- ? net effect is uncertain

Note: not all symbols may be used in all columns. In particular, the column 'D: Reversibility' can logically only contain the symbols: ▽ , ▼ or ? .

5.6 Analysis of incomplete and contradictory information

As a general rule, information on sustainability issues is generally not fully available and consistent, with the possible partial exception of economic data. If information were available, this would indicate that there is prior awareness and even debate on the issues being discussed.

Incomplete information is thus the usual situation in a sustainability impact analysis. Incomplete data can to an extent be supplemented or replaced through the use of case studies. Indeed, it is likely that new social or environmental sustainability issues that occur in localities remote from main urban areas will more often be first brought into view by witness accounts than by consistent and accurate statistics.

The two-stage methodology used in this study commences with a macroeconomic analysis and continues with detailed analyses of social and / or environmental issues in specific sectors or areas of study.

Because of this switch of disciplines, the information and indeed the concepts used will normally be different between the first and second stages. Even when discussing economic issues, different data sources and classifications will usually be required for macro and sector studies. The use of different sources and concepts is thus the general case.

Since this is the usual case, the point at which missing or conflicting information should first be dealt with is the detailed sector or area study.

[16] Largely taken from Kirkpatrick and Lee, 2002, page 28.

6. Stage 4: Mitigation and Enhancement Analysis

The Mitigation and Enhancement Analysis analyses the sustainability impacts previously identified, together with the pre-existing situation and the study's assessment of the relevant capacity to design, implement and maintain an enhancing activity or further policy change.

The outcome of this exercise is a set of proposals of potential activities that can be undertaken to counteract or mitigate any negative and enhance any positive sustainability impacts.

The inputs to the analysis is the sustainable impact assessment and the information that has gone into it.

The activity is dependent on the role that the study is playing, which was defined at the study inception and was examined in Section 3 above. The role defines the policy framework that can be analysed. For example, if the study role is as an advisor to one of the participants in a set of trade negotiations, then the policy framework that can be examined is dependent on what the participant in the trade negotiations can reasonably achieve in ameliorating the effects of the trade agreement.

The responses to the trade agreement or other policy change can in principle be of three kinds.

One type, the classic flanking measure can seek to ameliorate the outcomes of the trade measure or policy change. This type of response proposes to address the anticipated result by proposing activities that are usually carried out in the sector or geographical area of the sustainability impact.

The second type of response seeks to alter the initial trade measure or other policy change so as to obtain the original benefits as far as possible while ameliorating the accompanying sustainability impact. If an assessment sustainability impact is sufficiently detrimental, the response may seek to abandon the policy change. This in itself is a further policy change and its consequences must be analysed. This type of response does not occur in this study, as the trade negotiations were too far advanced at the start of the study.

The third type of response examines the pre-existing economic, social or environmental situation and the role of existing policy and social structures in contributing to the sustainability impact. If the role of the study permits, the response in this situation can be to propose actions that aim at improving the pre-existing social, economic or environmental situation and policies that underlie the sustainability impact.

In each case, the response has to be proportional in social, economic and environmental cost to the estimated sustainability impact.

B. Implementation

7. Overview of study implementation

Figure 7.1: Schema of sustainability impacts

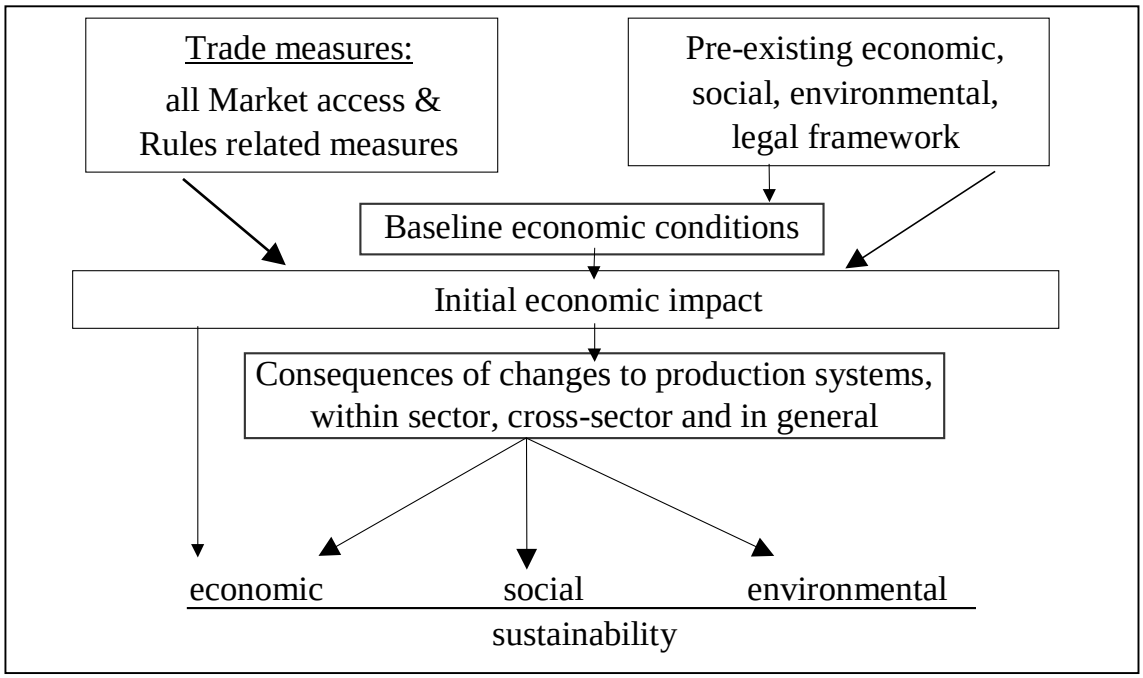
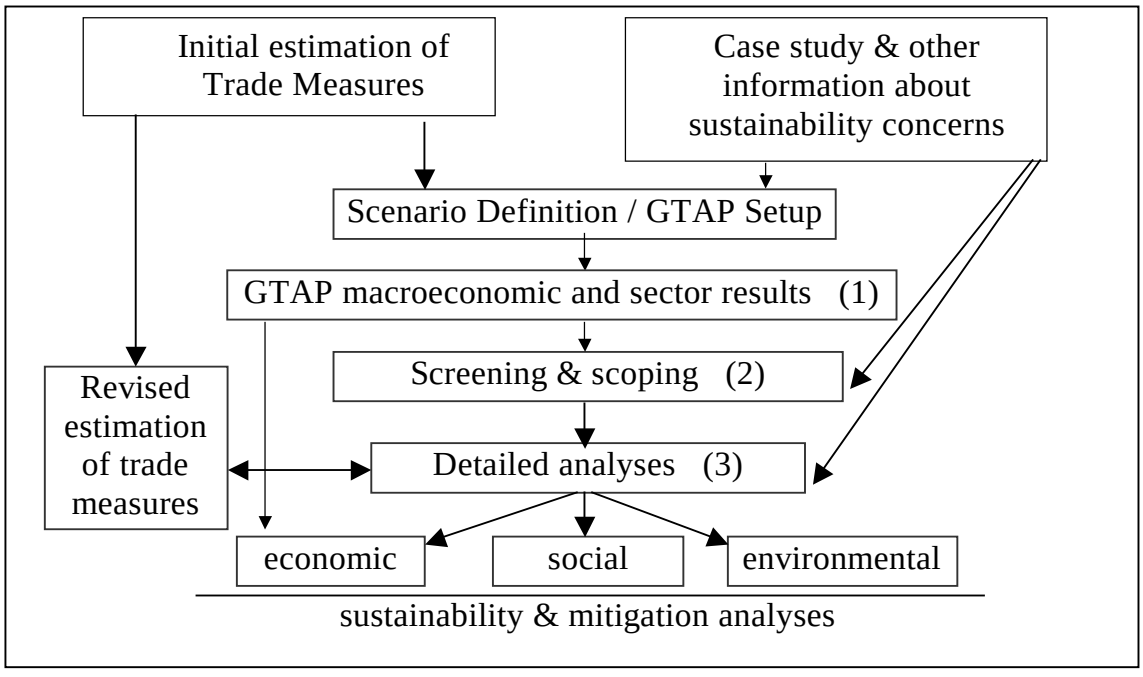


Figure 7.2: Analysis of sustainability impacts



7.1 Overview

The schema of study implementation of this study is described in Figure 7.1. It depicts the main linkages that will be taken into account when assessing the impact of EU-Chile Trade Agreement on sustainable development.

The pre-existing system of economic, social and environmental relations together make up the baseline conditions. The introduction of the EU-Chile Trade Agreement modifies tariffs, quotas and market access rules; its initial impact is therefore on the economy. In turn, the economic changes and trade measures can have repercussions on economic, social and environmental sustainable development indicators, often via changes to production systems.

To evaluate how Trade Agreement will directly and indirectly affect sustainability, we use a four-step SIA methodology.

7.2 Stage 1: Definition of scenarios

Two different scenarios will be confronted. The baseline scenario is the prolongation of the pre-existing situation. In the Trade Agreement Scenario, the EU-Chile Agreement is implemented.

7.3 Stage 2: Screening and scoping phase

The evaluation of the initial economic effects of the trade agreement is made through a Computable General Equilibrium (CGE) framework, namely the General Trade Analysis Project (GTAP) model. This is a tool for analyzing market transactions based on utility maximization and profit maximization by economic entities such as households and businesses, as well as inter-market transactions. A characteristic of the model is its ability to quantitatively assess the impacts of economic policy changes on the industrial structure, resource allocation, income allocation, and other items through changes in relative prices and the changes in the behavior of economic entities in response to relative price changes. The version of the GTAP model used in this study is described in Section 24, part D: Analysis Tools.

On the basis of this macroeconomic analysis, it is possible to determine which sectors are likely to be the most economically affected by the trade agreement. This analysis (point 1 in Figure 7.2) has a nearly comprehensive coverage of the economic impacts.

The Screening exercise (point 2 in Figure 7.2) is conducted on the basis of the results of the macroeconomic model. In this phase, we identify those sectors where a sustainability impact is likely to occur. As explained in Section 4, there exist four different ways to make this identification

i. Projected economic sustainability impact of the Trade Agreement

ii. Projected economic impact or Trade Measure is likely to lead to a change in production methods or relationships, then affecting sustainability

iii. Projected impact occurs in a sector where there is thought to be a direct link between output and environmental sustainability

iv. Reason to believe that the previous sector economic analysis needs reinforcement.

In-depth assessments concerning these sectors have then to be undertaken.

The Scoping exercise aims to determine the objectives and methods of the in-depth assessment studies that are intended to produce the information required for the social and environmental assessment of potential sustainability impacts. Its basis is the outcome of the screening exercise, which has established a link between the trade agreement or other policy change under study and economic consequences in the areas it considers to be of interest.

7.4 Stage 3: Assessment and uncertainty analysis

A series of in-depth analyses are carried out to provide the information for the final assessment of the potential sustainability impacts. In this study, this exercise is carried out in a two-stage format: an analysis of the previously identified sector-specific issues, followed by social and environmental summaries (point 3 in Figure 7.2). A key element of the in-depth study stage is that any previously omitted detailed information about the trade measures is analysed.

The sustainability assessment of the impact of the Trade Agreement on sustainable development is made in terms of a comprehensive set of sustainability indicators and a set of criteria for determining the magnitude and dimensions of a sustainability impact. The sustainability impacts are summarised in a comparable form on the basis of Table 5.2.

At the same time as the sustainability assessment and as part of this exercise, the information available is analysed for uncertainty or contradictory information. Any remaining uncertainties or conflicts of data are commented on.

7.5 Stage 4: Mitigation and enhancement analysis

On the basis of the sustainability assessment, it is then possible to define flanking measures to enhance the positive impacts and reduce the significant negative impacts associated with the Trade Agreement.

8. Implementation Stage 1: Developing the Scenarios

8.1 Overview

The study is based on a comparison of two scenarios. The first is a 'baseline' scenario, in which there is no trade agreement between the EU and Chile but that the Uruguay Round measures have been implemented. The second is a 'trade agreement' scenario, in which the EU-Chile trade agreement is implemented, as well as the Uruguay Round. The impact of the trade agreement consists of the differences between the baseline scenario and the 'trade agreement' scenario. One scenario that aims to represent the trade agreement scenario has been developed. Following the terms of reference, no alternative formulations of the trade agreement were developed as scenarios.

The definition of the scenarios consists of the description and representation of the trade measures to be analysed, the geographic coverage of the scenarios and the role of the analysis. The approach to developing the scenarios is discussed at Section 3 above.

The main element in constructing the 'trade agreement' scenario consists of describing the EU-Chile Trade Agreement and of representing its constituent trade measures in the analysis.

At the inception of the study, the EU-Chile Trade Agreement was not available for analysis by the study team. However, the European Commission discussed the EU-Chile Trade agreement in detail with the study team at the start of the study and these discussions were sufficiently complete for the macroeconomic modelling stage of the study[17]. The full EU-Chile Trade agreement was later made available to the study team. Although a large part of the study analysis was underway or complete by this time, the information arrived in time to be incorporated into the sector studies.

8.2 Background

8.2.1 Chile economic background

GDP grew at an average of over 9% per annum for a decade in the 1990s, slowing recently, as shown in Table 8.1. Gross domestic savings as a proportion of GDP are nearly 22%, while exports now are equivalent to 32% of GDP, and the external debt only 60% of GDP.

The IMF report of July 2001[18] stated that "Chile's economic performance was very strong during most of the 1990s" and that "real GDP is expected to grow by 4 percent" in 2001. "Chile's economic policy regime has been enhanced in recent years, including by switching to a freely floating exchange rate, strengthening the inflation targeting framework, progressively removing capital controls, and introducing measures to further develop domestic financial markets." "Chile has maintained a very open trade regime", which the Directors commended later in the report. The Executive Directors also "commended the Chilean authorities for their exemplary and long record of sound economic policies, which in the 1990s resulted in high and sustained economic growth, and a gradual decline in inflation ..." "Directors considered that the monetary and exchange rate policy regime are serving Chile well - including an exchange market that operates without intervention ..."

[17] The lack of sensitivity of macroeconomic models to precise degrees of liberalisation was also noted in Maltais, Nilsson and Persson, 2002.

[18] Chile: Selected Issues, IMF Country Report No. 01/120.

The Directors "supported the authorities' continued steps to further develop domestic financial markets and to strengthen Chile's financial integration with the rest of the world. They considered that all these measures would contribute to deeper and more efficient capital markets and proper incentives for capital flows in the context of a sound banking system. On the basis of available indicators, the banking system remains strong. Directors encouraged the authorities to continue to implement strict supervision practices and to advance in the introduction of supervision of financial conglomerates on a consolidated basis."

Table 8.1: Chile Employment and GDP

	Employment (thousand units)	Employment % change	GDP change %
1986	3723.77		
1987	3828.91	2.8	
1988	4078.45	6.5	
1989	4299.61	5.4	
1990	4374.23	1.7	
1991	4443.75	1.6	
1992	4657.66	4.8	
1993	4973.75	6.8	
1994	4944.98	-0.6	
1995	5004.94	1.2	
1996	5067.23	1.2	7.4
1997	5266.40	3.9	7.4
1998	5324.58	1.1	3.9
1999	5129.91	-3.7	-1.1
2000	5200.49	1.4	5.4
2001	5292.90	1.8	4.0
Average 1997-2001		1.0	4.5
	source: INE Chile		source: IMF

GDP – Gross Domestic Product

The report concluded by stating "that Chile's comfortable level of international reserves, strong banking system, credible policy framework, and exchange rate flexibility places the country in a good position to cope with the changes in the external environment."

For a country in southern Latin America of only 15 million inhabitants, with GDP per head of under $5 000[19], and with an extremely extended geographical reach, this commendation by the IMF is remarkable.

Chile's abundance of natural resources has been an important factor in its export-led growth strategy. Thus, most of its exports are natural resources. About two thirds of all exports are raw materials and about one third is semi-processed. Chile's main exports can be classified in four sectors: mining, fishing, agriculture and forestry. The main specific products exported by Chile are copper, fishmeal, frozen fish, grapes, apples, raw and bleached cellulose, pine lumber and wood chips.

[19] $ 4,990 in 1998 (GNP at PPP) - 'World Development Indicators 2000', World Bank Table 1.1. This compares, for example, with Turkey $ 6,594, Brazil $ 6,460, Thailand $ 5,524.

Without doubt, the economic opening contributed strongly to generating the dynamism shown by the Chilean economy over the last two decades, particularly in terms of its natural resources industries. In this sense, the external sector of the economy has played a central role in the country's strategy of development. Chile has consistently liberalized its international trade, through unilateral policies and bilateral and multilateral trade agreements. Over the last 25 years, Chile has reduced its tariffs from an average of 100% to a current average tariff of 11%.

As a result, the share of exports in Gross National Product increased considerably from 15.7 % in the period 1970-1993 to more than 35% in 2000. Currently, the commercial flows (imports plus exports) accounts for more than 60% of GNP and foreign investment for almost 5% of GNP.

8.2.2 Environmental background

Until the early 1990s, environmental management was largely absent in Chile. Many of Chile's major problems with air and water pollution problems are directly related to industries that are predominantly export-oriented. In the past, much of the nation's industrial pollution stemmed from copper smelters. Outside of the mining sector, pulp and paper factories and fish processing and other industrial sectors have contributed to the diverse range of environmental problems in the country, see CIPMA (2000).

Nevertheless, over the past years, Chile has made remarkable progress in establishing a policy and institutional framework to protect its rich natural resource base and to reduce pollution. Implementation of environmental standards is progressing mainly in the mining sector. Other sectors are still lagging behind. Across all industries, there are gaps in policies and limited, though improving, institutional capacity for implementing environmental policies.

8.2.3 Social background

Table 8.2: Changes in the participation rate of the population of 15 years old and more in the labour force by gender, 1990-1998

Percentage

Year	Men	Women	Total
1990	73.6	32.4	52.0
1992	75.9	34.1	54.0
1994	75.6	35.3	54.5
1996	74.7	36.3	54.7
1998	74.6	38.8	55.9

Source: MIDEPLAN (Chilean Ministry of Planning and Cooperation), Survey CASEN (National Socio-Economic Survey of Chile), respective years, published in CASEN VII, Document 11, Situation of Women in Chile, 1999, Table 32.

Table 8.2 shows the increasing participation of women in the Chilean labour force in recent years. The same document shows that women and men have similar educational experience but that access to education is significantly more limited for both sexes in rural than in urban areas. Over the period 1995-2000, the proportion of women in recorded employed increased only from 32.2% to 33.1%, according to the ILO LABORSTA database. This also shows that women's participation in 'urban' formal employment including

services and manufacturing is higher than in 'rural' employment and that these sectors account for all the growth in female employment.

This brief analysis shows a significant urban / rural social divide and suggests that gender-defined economic roles in rural areas are highly distinct.

8.2.4 Background to the Association Agreement

In 1994, the European Councils of Corfu (in June), of Essen (in December) and that of Madrid in December 1995, defined the general outlines of a new EU strategy towards the Latin American countries within the framework of the process of integration into the world market. In this perspective and in this political context, an Agreement with Chile, which was signed on 21 June 1996 at the European Council of Florence and entered into force on 1 February 1999, envisages substantial improvements in the political, economic, commercial and co-operation relations between the Parties.

The Framework Co-operation Agreement has as its objective the strengthening of the existing relations, on the basis of reciprocity and mutual interests, paving the way for the progressive and reciprocal liberalisation of trade, in order to lead to the establishment, in the long term, of a political and economic association between the European Community and its Member States and Chile, in accordance with the rules of the WTO.

On the occasion of the EU and Latin America and Caribbean Summit, which took place on 28-29 June 1999 in Rio de Janeiro, the Heads of State and of Government of Mercosur and Chile as well as the European Union reaffirmed the commitment to intensify their relations in order to encourage the increase and the diversification of trade, thanks to progressive and reciprocal liberalisation of this trade, and to promote the creation of favourable conditions to establish a political and economic association, taking into account the sensitivity of certain goods and services, in accordance with the rules of the WTO.

The negotiations on the establishment of a political and economic association were launched on 24 November 1999 on the occasion of the EU-Chile Joint Council meeting and were concluded at the end of the 10th round in April 2002. Chile and the EU have just signed a joint Declaration on the occasion of the second EU and Latin America and Caribbean Summit confirming the conclusion of the negotiations and the Agreement was initiated in mid June 2002.

Trade relations of Chile with EU are of prior importance for this country since the EU remains the single most important export market for Chile. Therefore, the Trade Agreement is expected to have an important impact on Chile.

8.3 Description of EU-Chile Trade Agreement

The European Commission sees the EU-Chile Association Agreement is the most important EU agreement with a third country.

A detailed description of the trade-related measures that form part of the Economic Partnership Agreement is included at Annex 5.

An overview of the trade-related measures that form part of the Economic Partnership Agreement is as follows:

While the agreement on elimination of customs duties is clearly a major step forward, the agreements on services, market access and investment are believed by the Commission to be the areas where the most important liberalisation has been made.

8.3.1 Elimination of Customs Duties

- The agreement on elimination of customs duties goods is the most extensive free-trade agreement signed by the EU with a third country. From the EU's side, there will be 100% liberalisation in industrial sectors; and quasi-total liberalisation in fishing and agriculture, with respect for a very limited number of sensitive sectors. For the EU's imports, 99.7% of imports by value are covered immediately. For Chile's imports, the Free Trade Agreement (FTA) will cover 97% of imports by value over 7 years and 94% of imports by value immediately[20].
- The total transition period is up to 10 years for certain products, but clearly almost all of the impact will occur immediately on coming into force of the agreement.
- Tariff quotas are applied on a limited number of products, for example in fisheries, either as a transitional measure with an increase in the tariff quota in each year towards open trade or in a very limited number of sensitive cases.
- Since there previously had been significant tariffs on a number of goods, notably in agriculture, fisheries, processed foods and wines and spirits but also in important sectors such as forest products, chemicals and textiles, the FTA could be expected to have a significant impact.

8.3.2 Non-tariff measures: Standards, Technical Regulations and Technical Cooperation

- Agreement on Customs co-operation and rules of origin
- Cooperation agreements on standards and technical regulations to eliminate technical barriers to trade. Agreements in this area on Government Procurement.
- Cooperation agreement on sanitary and phyto-sanitary (SPS) rules, which will facilitate trade in products of agriculture, processed foods, fisheries and wines and spirits.
- Trade facilitation and Institutional cooperation agreement,
- Agreement on fight against trade-related fraud

8.3.3 Specific sector agreements

- Fisheries: there is no access to fish in Chilean waters by foreign-flagged vessels and no port access to foreign fishing vessels. All fishing boats will have Chilean flag, as previously. EU Member State ownership of fishing boats and companies will be permitted if the Member State in question reciprocally permits Chilean ownership of boats in its waters. Previously, a fixed and limited number of fishing boats had been permitted to be owned by EU controlled companies. The Chilean fishing quota remains unchanged. The 200 miles exclusivity zone is respected
- Mining is specifically opened to investment by parties to agreement.
- Wine and Spirits – an agreement has been made not to use geographical or local product names of partner signatory.

[20] Information communicated from EU Commission.

8.3.4 Services and market access agreements:

- Foreign direct investment: National treatment - equally favourable treatment covering market access, regulation and licensing for companies owned by parties to agreement
- This provides market access in services and construction
- Financial Services market access. The only exception to market access is that public pension plan funds are required to stay in Chile.
- Agreement on opening public markets, covering all general government, in accordance with GATT Article 5, giving a profound integration.
- Protection of intellectual property – TRIPs (Trade Related Intellectual Property) agreement.
- Competition agreement.
- Possibility of temporary employment for nationals of parties to agreement as Contract Suppliers.
- e-commerce paragraph is limited as Chile does not yet wish to exclude customs rights. Therefore limited agreements on e-signatures.

8.4 Representation of the EU-Chile Trade Agreement in the analysis tools

8.4.1 Overview

This subsection describes how the trade agreement information is represented in the macroeconomic modelling stage of the study. This consists of defining the model sectors for the scenarios and detailing how the trade measures are represented in the simulations. The underlying principles are considered in Section 3 above.

The sectors definitions need to identify the areas that might be of interest to the study. The scenario sectors are defined in terms of the basic GTAP sectors and are shown in Table 8.5, which also shows the ISIC Rev. 2 (International Standard Industrial Classification) categories covered by each scenario sector. Each sector can be defined to cover one or more basic GTAP sectors. However, dividing up a GTAP sector is not possible. The maximum number of sectors that can be defined is about 26; a greater number makes the model solution difficult to compute.

Areas that might be of interest to the study included those that had been noted in discussions with the European Commission. These included Fisheries; Forestry; Mining; and Beverages and Tobacco, plus closely linked sectors such as Processed Foods; Wood, Pulp and Paper; and Non-Ferrous Metals. Other sectors were considered to be of potential interest either as a result of case studies in comparable situations or because of a general interest in the social or environmental susceptibility of certain sectors. Case studies contained in von Moltke, 2002 and GEM / WIDE / CISCA, 2001 led the study team to ensure that Grains, Other Agriculture and Cattle were identifiable. The interest was in potential economic changes in agricultural sectors that might have social or environmental consequences. Similarly, Textiles and Clothing were shown to see if any employment changes were projected.

It must be underlined that this sector definition does not constitute an identification or screening of sectors. Instead it is merely a step to ensure that sector economic results of potential interest can be analysed.

The GTAP sector classification was not a limitation except that it is only possible to distinguish the effects on the sector 'Beverages and Tobacco

Products' as a whole, whereas the trade measures negotiated will affect specifically wines and spirits. This is not serious, as tobacco and other beverages are not exported in large quantities from Chile to the EU. The scenario sector Electricity, Water and Other Manufactures contains also Gas. The "Other Manufactures" part of this sector is small compared to the rest of the sector and water supply is electricity intensive. Therefore, the sector definition is appropriate for its purpose.

8.4.2 Estimating the trade measures

The trade measures were represented in the 'trade agreement' scenario as estimated total percentage reductions in the level of signatories' existing protection by sector.

The estimated reductions in protection are shown in Table 8.3. Note that only the total percentage reduction in the level of protection, shown in the final column, is used in the model.

The study team estimated the impact of each trade measures for each sector on the basis of discussions with the European Commission, other information available and previous trade agreements. Each trade measure, such as increased market access measures, was considered as equivalent to a reduction in total barriers to completely open trade. Similarly, trade measures such as the SPS (sanitary and phyto-sanitary agreement) are considered as decreasing barriers to trade.

It should be made clear that these estimates were made at an early stage in the project before full information was available to the study team on the extent of the trade agreement.

The precise level of trade 'liberalisation' used in the modelling process is not thought to have a significant impact on the results, following experience with other GTAP simulations of trade agreements[21], although the evidence is not unanimous – for which see G.W. Harrison, T.F. Rutherford and D.G. Tarr, 2001[22]. The results of the model can certainly be considered as being strong in terms of direction and magnitude but not necessarily as being an accurate quantitative forecast. The quantitative results are therefore verified as appropriate by the more detailed sector studies.

[21] see Maltais, Nilsson and Persson, 2002.

[22] Trade Policy Options for Chile The Importance of Market Access, 2001.

Table 8.3: Initial Estimates for EU-Chile Trade Agreement for Modelling Purposes

Trade-related measures - Estimated as % reduction in existing protection						
Sector		**Tariff & tariff quota reduction**	**market access ***	**rules-related +**	**SPS**	**Total protection reduction**
1	Grains	65%				**65%**
2	Other agriculture	55%			10%	**65%**
3	Cattle	55%			10%	**65%**
4	Mining			100%		**100%**
5	Forestry			80%		**80%**
6	Fisheries	55%			10%	**65%**
7	Dairy	55%			10%	**65%**
8	Meats	55%			10%	**65%**
9	Processed foods	55%			10%	**65%**
10	Beverages & tobacco	45%		10%	10%	**65%**
11	Textiles	80%				**80%**
12	Clothing	80%				**80%**
13	Leather	100%				**100%**
14	Wood, pulp & paper			80%		**80%**
15	Chemicals	100%				**100%**
16	Refineries	100%				**100%**
17	Steel	100%				**100%**
18	Non-ferrous metals	100%				**100%**
19	Motor vehicles	100%				**100%**
20	Electronics	100%				**100%**
21	Other machinery	100%				**100%**
22	Electricity, water & other manufactures	100%				**100%**
23	Wholesale, retail, restaurants, hotels, transport, communication		5%	75%		**80%**
24	Construction		5%	75%		**80%**
25	Business services		5%	75%		**80%**
26	Other services		5%	75%		**80%**

In the industrial sectors, tariffs have been the main elements of protection. In these sectors, 100% reduction in tariffs and so fully open trade has been assumed. In the agricultural and related sectors, the decrease in total protection, comprising reduction in tariffs, tariff quotas and reduction in technical barriers to trade through sanitary and phyto-sanitary regulations, was set at 65%. For forest-based products, the assumption was that not all producers would be able to meet EU process regulations, so the reduction in protection was set at 80%. In services, the reduction in protection was also set at 80% on the basis that not all services companies would be able to comply with sector regulations in the trading partner's country.

An issue of note is that the 'trade agreement' scenario attempts to depict the full impact of the EU-Chile trade agreement. Each trade measure is assumed to be fully and correctly implemented. This assumption is however, open to being questioned in the more detailed sector studies.

8.5 Other issues

Both the baseline scenario and the trade-agreement scenario are developed to cover the signatories to the trade agreement as well those other countries and regional groupings that might be affected by it. These countries and country groups are as follows:

- European Union as a whole
- Chile
- Mercosur
- Mexico

The GTAP model is a world model and the world regions identified are shown in Table 8.4. GTAP identifies a number of other countries and areas in the world. The impacts on these countries and areas are not significant and these results are not further discussed.

The role that the SIA takes is that of informing the Commission as a party to the trade negotiations of the potential consequences of the trade measures under discussion.

Table 8.4: The geographical classification of the Model

Model Regions
US-Canada
Mexico
Chile
MERCOSUR
Rest of Latin America
EU Associate Countries
Turkey
EU 15
Africa and Middle East
Rest of World

Table 8.5: Simulation Model Sector Definitions

	Simulation Model Sectors	GTAP sectors	ISIC categorisation
1	Grains	1-3	1110 (part of), 1120 (part of)
2	Other agriculture	4-8	1110(part of), 1120 (part of)
3	Cattle	9-12	1110(part of), 1120 (part of), 1130
4	Mining	15-18	2100, 2200, 2301-2302, 2901-2909, 3530 (part of), 3540 (part of)
5	Forestry	13	1210, 1220
6	Fisheries	14	1301-1302
7	Dairy	22	3112
8	Meats	19-20	3111
9	Processed foods	21, 23-25	3113-3122
10	Beverages & tobacco	26	3131-3140
11	Textiles	27	3211-3219
12	Clothing	28	3220
13	Leather	29	3231-3240
14	Wood, pulp & paper	30,31	3311-3320, 3411-3420
15	Chemicals	33, 34	3511-3529, 3551-3699
16	Refineries	32	3530 (part of), 3540 (part of)
17	Steel	35	3710
18	Non-ferrous metals	36, 37	3720, 3811- 3819
19	Motor vehicles	38	3843
20	Electronics	40	3825, 3832
21	Other machinery	39, 41	3821-3824, 3831, 3833-39, 3841-3849, 3851-3853
22	Electricity, water & other manufactures	42-45	3901-4200
23	Wholesale, retail, restaurants, hotels, transport, communications	47-51	6100-7200
24	Construction	46	5000
25	Business services	52-54	8101-8330,0
26	Other services	55-57	9411-9600

9. Macroeconomic Analysis

9.1 Overview

The purpose of this exercise was to provide a comprehensive[23] Computable General Equilibrium (CGE) based analysing of the initial economic consequences of the trade measures that are estimated to be the outcome of EU – Chile Trade Agreement. The CGE model used was GTAP, which is described in Section 24 below.

The outcome of this analysis is a quantitative indication at macroeconomic and sector levels of these economic consequences. At macroeconomic level, these directly provide information on the study's economic sustainability indicators: average real income; employment; and (indirectly) net fixed capital formation. At sector level, the exercise provides information on which sectors the trade measures have an economic impact in terms of output and employment. Sustainability impacts, whether economic, social or environmental, must arise from an initial economic impact. This is not to say, for reasons outlined above, that there could not be a sustainability impact in sectors not identified by this process. But if there is no direct economic impact on a sector, then the causal chain analysis requires a demonstration that there is a linkage from a sector where there is a direct economic impact.

To the extent that the analysis identifies macroeconomic and sector effects, the model is being used as a screening tool to inform the Stage 2 screening process.

9.2 Results

The results of the simulations are shown in Tables 9.1 to 9.6, immediately following this Section. The data refer to the effects on the Chilean, EU and other countries and regions' economies as they stood in 1997, the latest year for which GTAP data is available. The unit of measurement is the 1997 US dollar. The results are shown in quantity and value terms. 'Quantity' measures the amount of output (production), exports and imports at the original (base) 1997 prices. 'Value' takes into account the new set of 1997 prices that the model projects would occur with the trade agreement in place. Since the differences in prices are not large, we have in many cases analysed only the quantity results.

As can be seen from Table 9.1 *column a*, the Macroeconomic Summary, there is an expected total growth in Chile's real income[24] of 0.4% of GDP as a result of the trade agreement. This is less than a year's normal economic growth. One reason for the relatively muted economic response is that Chile has already considerably liberalised external trade.

For the EU, while the positive real income effect at 800 million 1997 dollars is larger in absolute values than Chile's expected gain of 300 million 1997 dollars *(column m)*, it is barely discernable as a percentage of the EU's GDP *(column a)*. The results for GDP growth in *column a* are comparable with those in *column e* for real income. Chile's capital stock is expected to grow by about 1.2% as a result of the trade agreement (*column d*). The change in the EU's capital stock is expected to be negligible as a percentage of the total, as shown in *column d*.

[23] Though with known exceptions –see section on 'Overview of Study Implementation'.

[24] The central income concept in GTAP is 'real income', a more long-term concept than real GDP. In addition, it takes into account gains from trade, increased capital stock (which are reflected in falling prices) and substitution among goods and services.

The real wage bill in Chile is expected to increase in total by 0.5% for skilled labour and by 0.8% for unskilled labour, as shown in *columns f & g*. This is best interpreted as either a small but noticeable increase in real wages or a similar increase in structural employment or some combination of the two. The impact of the trade agreement on real wages in the EU is negligible. The nominal wage bills shown in *columns h & j* rise by less than real wages because prices decline as a consequence of the trade agreement.

The value of Chile's exports is projected to increase by 3.2% *(column b)* and of its imports by 3.0% *(column c)*. For the EU, the export increase is expected to be negligible in percentage terms *(column b)* while imports are expected to increase by 0.1% as a result of the agreement, as shown in *column c*. The corresponding dollar changes in exports are shown in *column p*.

The percentage changes in the nominal wage bills for unskilled and skilled labour *(columns h & j)* and the nominal values of GDP *(column k)* and exports *(column n)* reported in the lower half of Table 9.1 should be interpreted with care. These nominal values refer to prices that are reduced as a result of the trade agreement, in comparison with the situation without the trade agreement. The real values of Chile and EU income, GDP, trade and wages all increase as a consequence of the trade agreement.

Columns q & r show the comparable size of the base skilled and unskilled wage bills for the countries and regions identified.

The trade diversionary effect on the Mercosur economy is expected to be minimal, although exports and imports both decline by about 0.1% *(columns b &c)*. There is, however, expected to be a small negative trade diversion effect on Mexico in terms of real income, capital stock and real wages *(columns d, e, f, g)*. It should be noted that the EU and Mexico have previously made a comparable free trade agreement, as have Chile and Mexico[25]. The results show that some of the trade diversion effects that had previously benefited EU-Mexico trade and Chile-Mexico trade at the expense of other trade flows and countries will now be eliminated by the EU-Chile agreement. Trade diversion impacts on third countries are an inevitable result of bilateral trade agreements and can only be avoided by multilateral trade rounds, such as the Doha round. It should be underlined that the impact on Mexico of the EU-Chile trade agreement is of a minor order. The negative impact of the EU-Chile trade agreement on other world regions is minimal.

As a result of the small scale of the changes to the EU economy, the remaining discussion of results will focus on Chile. At sector level, the consequences for the EU economy are sufficiently small to be best examined within the context of general economic and social development. EU sector changes are also examined in Section 16.

Overall, the sector effects on the Chilean economy are for a shift towards sectors in which Chile enjoys a comparative advantage away from those in which it is less internationally competitive. The scale of this change is of the magnitude of one year's economic change, experienced over a much longer timeframe.

Thus, Table 9.2: Changes in Output by Sector, shows a boost to output in the majority of the most important Chilean sectors by up to most one normal year's growth. Largest output growths are expected in Processed Food (+243 millions dollars, 3.4%), Construction (+118 million dollars, 1.1%), Other Agriculture (+102 million dollars, 1.9%), Chemicals (+76 million dollars,

[25] Signed in 1998, into effect in 1999. See the website of SICE - Foreign Trade Information System of the Organization of American States, www.sice.oas.org.

1.6%). Most of the services sectors will also experiment a noticeable output expansion: Other services (+76 million dollars, 0.4%), Wholesale, retail, restaurants, hotels, transport and other communication services (+50 million dollars, 0.2%), business services (+47 million dollars, 0.5%).

Apart from the above sectors, the Trade Agreement will simulate some sectors of secondary importance to the Chilean economy. This is the case with Non-Ferrous Metals (2.0%), Grains (2.2%), Meats (1.3%), Beverages and Tobacco (1.4%), Wood Pulp and Paper (0.8%) and Fisheries (1.7%). Output expansion in these sectors will range from 37.8 to 25 million dollars.

A decrease in output is expected to occur in several equipment goods sectors: Electronics, Motor vehicles, Other Machinery. Output will also decline for Electricity, Water and other Manufactures, and for Steel. Most of these sectors are minor in the Chilean economy and account for less than 0.5% of total output. The corresponding diminutions in output will not exceed 10 million dollars. However, the Other Machinery sector represents almost 4% of total Chile output and that will undergo an output reduction of 2.1%, valued at almost 100 millions dollars. As with the sectors that are stimulated by the Trade Agreement, this decline in sector output is less than one year's decline in a normal economic cycle.

Turning to Table 9.3: Changes in Export Values and Quantities, we see that the sectors with the largest value and quantity change are Other Agriculture, Processed Foods, Chemicals and Non-Ferrous Metals. This implies that the increased output in Grains is destined for either intermediate or final domestic demand. There are no export sectors with large-scale growth that do not have significant output growth.

Chile moves towards greater specialisation in trade, with a reinforcement of the major export sectors. Indeed, most of the main Chilean exports (Non-Ferrous Metals, Processed Foods, Wood and paper, Other Agriculture and Chemicals) are strongly stimulated in quantity growth. Export percentage growth is high only for processed Food (+12.4%) and Chemicals (+10.8%). The Meats sector also experiments a significant growth in export quantities with growth of 39.2 million dollars. Processing of the output of the Mining sector is shifted domestically through the Non-Ferrous Metals sector. Thus, while exports of that sector grow, direct exports of Mining are expected to shrink by 10 million dollars. A relatively minor reduction is projected in business services exports, which accounts for 3% of Chilean trade. Wholesale, retail, restaurants, hotels, transport and other communication services' exports are expected to diminish[26].

Note that the way that the 'Wholesale, retail, restaurants, hotels, transport and other communication services' sector is modelled means that it is best to examine the sector output (which shows basically zero change) rather than the exports.

The differences between the changes in export quantities and export values are accounted for by changes in relative prices. Since neither the scale of the impact of the EU-Chile trade agreement nor its sector composition are significant enough to have a major impact on prices of international traded goods and services, the two measures show similar movements. The same can be said for the Table 9.4, Imports Values and Quantities, where imports growth reflects increased demand, the change in trade specialisation and imports used and input into producing exports.

As was shown in Table 9.1: Summary of Macroeconomic Effects, there is an expected increase in real wages of both skilled and unskilled Chilean labour as

[26] Note that the way this sector is modelled means that it is best to examine the sector output (which shows basically zero change) rather than the exports.

a result of the EU-Chile trade agreement. It is possible to interpret this real wage increase as an impetus toward structural change in the labour market, reducing structural unemployment or exclusion from the labour market instead of wage increases. Note that the greater increase is in unskilled wages.

Table 9.5: Changes in Employment by Sector needs to be interpreted with care. This table shows the long-run changes in the share or composition of total employment by sector and by skill. The total number of employees in this table is thus the same with and without the trade agreement. The table thus excludes any growth in employment as a result of structural changes.

Table 9.5 also does not show the frictional unemployment that arises when workers are forced to change sector employment. In general, if the new jobs are in different locations from the original employment and/or there is limited information about employment opportunities, this frictional employment can persist for some time. However, Table 9.5 shows that the likely sector employment losses are small. Only in the Steel, Motor Vehicles and Other Machinery sectors is employment loss over 2% of either skilled or unskilled labour. Since the first two sectors together account for less than 1% of output, only in the Other Machinery sector, which accounts for under 4% of output is there any possibility of significant frictional unemployment. The labour market and employment effects are two: a positive effect on real wages and/or structural employment, together with a possible but much smaller negative effect on frictional unemployment, which might be of the order of 0.1% of total employment, clearly within the range of normal employment changes.

The definition of skilled and unskilled labour groups used by GTAP is based on the International Labor Organization (ILO) classification, in which the skilled labour (professional workers) category is assumed to consist of managers and administrators, professionals, and para-professionals. Trades-persons, clerks, salespersons and personal service workers, plant and machine operators and drivers, labourers and related workers, and farm workers comprise the unskilled labour (production workers) category[27]. Note that these definitions of skilled and unskilled labour are different from those used in sector studies, which use data directly from INE-Chile.

Table 9.5 shows that skilled labour benefits more from the restructuring of sector employment than unskilled labour, as sector employment increases are greater or job losses are smaller. This is because employment under this international definition of skilled labour is much smaller than that of unskilled labour. However, this comparison is not the whole story, as Table 9.1 shows that overall real wages to unskilled labour grow more than real wages to skilled labour.

The sectors where employment grows most in percentage terms are Grains, Processed Food, Other Agriculture and Fisheries. Employment increases, that concern both skilled and unskilled employment, range from 2.41 to 2.84%. These are all medium employment sectors. The sector 'Wholesale, retail, restaurants, hotels, transport and other communication services' is a very large employer and the model projects employment losses in this sector, as the model projects productivity growth to outstrip the sector's minimal growth. However, for technical reasons, the output projection in this sector is subject to a degree of uncertainty. The more detailed study of part of this sector in Section 14 (Sector study: Transport and Electricity) suggests that

[27] 'Skilled and Unskilled Labor Data', Betina V. Dimaranan, Chapter 18D, in Dimaranan, Betina V. and Robert A. McDougall (2002). *Global Trade, Assistance, and Production: The GTAP 5 Data Base*, Center for Global Trade Analysis, Purdue University.

the employment loss in this sector may be considerably less than the model suggests.

In some sectors, a resource reallocation process is expected to occur, with a decrease in unskilled employment and an increase in skilled employment. This will happen mainly in consumption goods sectors (Textile, Clothing, Leather and Wood) and in Business Services.

Concerning Table 9.6: Changes in Private Household Consumption, there is a clear increase in consumption of durables such as Motor Vehicles, Electronics and Other Machinery. Smaller increases occur in consumer goods such as Textiles, Clothing, Wood, Pulp and Paper and Chemicals. The very much smaller declines in consumption of food-related products are probably a mixture of substitution of different types of food and, for the comparatively wealthy, of restaurant services. There is no evidence from this analysis of the poor being crowded out of the food market by higher prices. Growth in consumer expenditure on 'Wholesale, retail, restaurants, hotels, transport and other communication services' at 0.3% is one indicator of the demand for road transport. However, as this sector is fairly heterogeneous, a better indicator might be the growth in real income at 0.4%.

9.3 Macroeconomic Results Tables

Table 9.1: Summary of macroeconomic changes

	Percent change in macroeconomic indicators								
	Real GDP	Value of exports	Value of imports	Capital stock	Real income (per-cent of GDP)	Real wage bill un-skilled labour	Real wage bill skilled labour	Nominal wage bill un-skilled labour	Nom-inal wage bill skilled labour
*	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*J*
Chile	**0.5**	**3.2**	**3.0**	**1.2**	**0.4**	**0.8**	**0.5**	**0.6**	**0.2**
EU 15	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**-0.1**	**0.0**
MERCOSUR	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1
US-Canada	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.1
Mexico	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-1.9	-2.0
Rest of Latin America	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.1	-1.0
EU Associate Countries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.3
Turkey	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.4
Africa and Middle East	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.3
Rest of World	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3

	Dollar change in macroeconomic indicators (millions)				Dollar base values	
	Nominal GDP value	Real income effect	Nominal value of exports	Value of exports at base prices	Base wage bill unskilled labour	Base wage bill skilled labour
*	*k*	*m*	*n*	*p*	*q*	*r*
Chile	**-47**	**293**	**618**	**657**	**18 857**	**7 664**
EU 15	**-2 245**	**804**	**-1 213**	**92**	**2 351 886**	**1 564 033**
MERCOSUR	-1 539	-41	-350	-290	370 949	162 834
US-Canada	-10 949	-109	3 697	5 392	3 098 810	2 125 141
Mexico	-8 263	-252	-1 785	-1 587	79 120	29 531
Rest of Latin America	-3 472	-4	-1 401	-836	98 399	41 120
EU Associate Countries	-654	-11	-377	-108	100 787	36 072
Turkey	-968	-6	-402	-177	49 022	18 806
Africa and Middle East	-2 549	-59	-1 461	-1 372	345 788	137 178
Rest of World	22 292	-133	9 756	11 764	2 846 109	1 470 126

source: model-based estimates * column references in text
note: the net trade balance is fixed, so the nominal value of import changes mirrors export changes.
1997 data – Chilean GDP in 1997 was $75.0 bn[28].

[28] IMF Chile 2001 Article IV Consultation Report – Country Report N° 01/116.

Table 9.2: Changes in Output of Goods and Services by Sector

		Chile output value shares (percent)	Percent changes in output quantity		Chile: Percent of total output change	Chile: Changes in output quantity (millions of dollars)
			Chile	European Union		
Grains	*	1.39	2.21	-0.09	4.3	36
Other agriculture	*	4.61	1.89	-0.08	12.1	102
Cattle		0.48	1.24	-0.03	0.8	7
Mining	*	2.44	0.36	0.05	1.2	10
Forestry	*	0.31	0.52	0.00	0.2	2
Fisheries	*	1.26	1.69	-0.01	3.0	25
Dairy		1.70	0.51	-0.01	1.2	10
Meats		2.44	1.25	-0.03	4.2	36
Processed foods	*	6.20	3.35	-0.09	28.7	243
Beverages & tobacco		2.01	1.36	-0.02	3.8	32
Textiles		1.88	0.44	0.02	1.1	10
Clothing		1.65	0.73	-0.01	1.7	14
Leather		0.58	0.43	0.03	0.3	3
Wood, pulp & paper	*	3.12	0.79	0.01	3.4	29
Chemicals	*	4.09	1.59	0.02	9.0	76
Refineries		1.48	0.06	0.03	0.1	1
Steel		0.31	-1.71	0.05	-0.7	-6
Non-ferrous metals	*	1.60	2.01	-0.04	4.5	38
Motor vehicles		0.62	-1.26	0.06	-1.1	-9
Electronics		0.29	-1.13	0.02	-0.4	-4
Other machinery		3.92	-2.12	0.06	-11.5	-97
Electricity, water & other manufactures	#	0.22	0.04	0.00	0.0	0
Wholesale, retail, restaurants, hotels, transport, communication	*	22.31	0.19	0.01	5.9	50
Construction	*	9.18	1.10	0.01	14.0	118
Business services	#	8.37	0.48	0.00	5.6	47
Other services	#	17.51	0.36	0.01	8.7	74
Total		**100.00**			**100.0**	**847**

source: model-based estimates

Values take into account relative price changes; quantities do not.

* covered by sector studies. See Section 10 and sections 11-15

covered by a sector study. Output estimates revised by this study – see sections 14 and 15.

Table 9.3: Changes in Export Values and Quantities

	Chile: Sector shares of total exports (percent)	Chile: Value of 1997 exports (millions of dollars)	Percent changes in export quantities		Percent changes in export values		Chile: Change in value of exports (millions of dollars)
			Chile	Europe-an Union	Chile	European Union	
Grains	0.26	49	22.3	-0.2	24.3	-0.2	12
Other agriculture	6.90	1 297	4.7	-0.2	6.3	-0.2	82
Cattle	0.02	4	0.0	0.0	1.8	0.0	0
Mining	13.25	2 491	-0.4	0.1	-0.3	0.1	-8
Forestry	0.64	120	-0.7	0.0	-0.5	0.0	-1
Fisheries	1.01	190	-5.1	0.0	-2.9	-0.1	-5
Dairy	0.18	34	8.8	0.0	9.2	0.0	3
Meats	0.42	80	49.2	-0.1	50.5	-0.1	40
Processed foods	11.80	2 219	12.4	-0.2	12.8	-0.2	283
Beverages & tobacco	2.44	460	8.4	-0.1	8.4	-0.1	39
Textiles	0.88	165	4.6	0.0	3.7	0.1	6
Clothing	0.38	71	22.9	0.0	21.9	0.0	16
Leather	0.25	48	16.6	0.1	15.9	0.1	8
Wood, pulp & paper	9.65	1 814	2.5	0.0	1.9	0.0	34
Chemicals	4.95	931	10.8	0.0	9.7	0.1	90
Refineries	0.10	20	1.2	0.1	0.9	0.1	0
Steel	0.44	83	5.9	0.1	5.3	0.1	4
Non-ferrous metals	27.12	5 099	2.9	-0.1	2.3	-0.1	118
Motor vehicles	0.37	70	19.2	0.1	17.4	0.1	12
Electronics	0.10	19	10.8	0.0	9.5	0.1	2
Other machinery	3.53	663	5.0	0.1	4.3	0.1	29
Electricity, water & other manufactures	0.15	28	7.6	0.0	6.6	0.0	2
Wholesale, retail, restaurants, hotels, transport, communication	11.71	2 202	-3.0	0.0	-3.4	0.0	-75
Construction	0.04	8	-3.8	0.0	-4.3	0.0	0
Business services	2.60	489	-3.7	-0.1	-4.0	0.0	-19
Other services	0.79	149	-1.6	-0.1	-2.0	-0.1	-3
Unallocated							-12
Total	**100.00**	**16 616**			**3.2**	**0.0**	**657**

source: model-based estimates.

Exports are measured free on board (fob)

Values take into account relative price changes; quantities do not.

Totals may not add due to rounding

Table 9.4: Changes in Import Values and Quantities

	Chile: sector shares of total imports (percent)	Chile: value of 1997 imports (millions of dollars)	Percent changes in import quantities		Percent changes in import values		Chile: Change in value of imports (millions of dollars)
			Chile	Europe-an Union	Chile	European Union	
Grains	0.81	169	5.5	0.0	5.5	0.0	9
Other agriculture	1.05	219	5.4	0.1	5.4	0.1	12
Cattle	0.01	3	2.1	0.0	2.1	0.0	0
Mining	7.10	1 488	0.3	0.0	0.3	0.0	4
Forestry	0.03	5	5.1	0.0	5.1	0.0	0
Fisheries	0.02	4	10.3	0.0	10.3	0.0	0
Dairy	0.25	53	3.9	0.0	3.9	0.0	2
Meats	1.08	226	2.5	0.1	2.5	0.1	6
Processed foods	2.96	619	4.2	0.2	4.1	0.2	26
Beverages & tobacco	0.48	100	5.9	0.1	5.9	0.1	6
Textiles	3.60	754	2.1	0.0	2.1	0.0	16
Clothing	1.89	396	2.9	0.0	2.9	0.1	11
Leather	1.67	351	3.5	0.0	3.5	0.1	12
Wood, pulp & paper	3.02	634	5.6	0.0	5.6	0.0	35
Chemicals	11.63	2 436	3.6	0.0	3.6	0.0	88
Refineries	1.86	390	1.8	0.0	1.8	0.0	7
Steel	2.88	604	2.5	0.1	2.4	0.1	15
Non-ferrous metals	0.70	147	4.3	0.1	4.2	0.0	6
Motor vehicles	8.55	1 791	3.4	0.0	3.4	0.1	60
Electronics	6.42	1 346	2.3	0.0	2.3	0.0	31
Other machinery	29.41	6 174	4.6	0.0	4.6	0.1	282
Electricity, water & other manufactures	1.85	388	2.5	0.0	2.5	0.0	10
Wholesale, retail, restaurants, hotels, transport, communication	8.20	1 907	0.2	0.0	0.2	0.0	4
Construction	0.05	11	-1.5	0.0	-1.5	0.0	0
Business services	2.86	665	-0.7	0.0	-0.7	0.0	-5
Other services	1.62	376	-1.0	0.0	-1.0	0.1	-4
Total	**100.00**	**21 255**			**3.0**	**0.1**	**634**

source: model-based estimates

imports are measured cost, insurance freight (CIF)

Values take into account relative price changes; quantities do not.

Totals may not add due to rounding

Table 9.5: Changes in shares of total employment in Chile (percent)

	Share of total employment - Base values				Percent change in share of total from base	
	Unskilled share of sector employ-ment	Sector share in total unskilled employ-ment	Skilled share of sector employ-ment	Sector share in total skilled employ-ment	Unskilled Labour	Skilled Labour
Grains	98.3%	2.3%	1.7%	0.1%	2.75	2.84
Other agriculture	98.3%	9.5%	1.7%	0.4%	2.41	2.50
Cattle	98.3%	0.9%	1.7%	0.0%	1.72	1.81
Mining	85.8%	3.6%	14.2%	1.5%	0.42	0.49
Forestry	98.3%	0.3%	1.7%	0.0%	0.47	0.54
Fisheries	98.3%	1.1%	1.7%	0.0%	2.33	2.41
Dairy	94.1%	1.4%	5.9%	0.2%	0.70	0.93
Meats	85.7%	1.3%	14.3%	0.5%	0.57	0.99
Processed foods	81.4%	3.3%	18.6%	1.8%	2.39	2.82
Beverages & tobacco	86.1%	1.8%	13.9%	0.7%	0.67	1.09
Textiles	86.4%	1.8%	13.6%	0.7%	-0.46	0.01
Clothing	86.6%	1.0%	13.4%	0.4%	-0.10	0.37
Leather	86.5%	0.3%	13.5%	0.1%	-0.36	0.11
Wood, pulp & paper	84.8%	3.2%	15.2%	1.4%	-0.27	0.20
Chemicals	79.2%	3.9%	20.8%	2.5%	0.66	1.14
Refineries	82.5%	0.1%	17.5%	0.1%	-1.29	-0.82
Steel	85.7%	0.2%	14.3%	0.1%	-2.77	-2.31
Non-ferrous metals	83.9%	3.6%	16.1%	1.7%	0.91	1.38
Motor vehicles	81.7%	0.4%	18.3%	0.2%	-2.23	-1.77
Electronics	78.1%	0.3%	21.9%	0.2%	-1.72	-1.26
Other machinery	82.4%	3.8%	17.6%	2.0%	-3.02	-2.56
Electricity, water & other manufactures	87.5%	0.2%	12.5%	0.1%	-0.73	-0.26
Wholesale, retail, restaurants, hotels, transport, communication	79.9%	19.3%	20.1%	12.0%	-1.28	-0.68
Construction	84.7%	10.4%	15.3%	4.6%	0.20	0.73
Business services	55.0%	10.2%	45.0%	20.6%	-0.46	0.01
Other services	44.9%	15.8%	55.1%	48.0%	-0.55	-0.08

source: model-based estimates

note: share totals may not sum to 100% due to rounding

This table shows the long-run changes in the share or composition of total employment by sector and by skill. The total number of employees in this table is thus the same with and without the trade agreement.

Table 9.6: Changes in private household consumption in Chile

	Base values million dollars	Value shares (percent)	Change in prices (percent)	Quantity changes (percent)	Quantity changes, million dollars
Grains	516.3	1.0	1.51	-0.15	-0.8
Other agriculture	1 684.4	3.3	1.47	-0.27	-4.5
Cattle	0.1	0.0	1.81	-0.34	0.0
Mining	0.6	0.0	0.01	0.09	0.0
Forestry	14.3	0.0	0.17	0.01	0.0
Fisheries	176.1	0.3	2.32	-0.43	-0.8
Dairy	1 160.5	2.3	0.26	-0.05	-0.6
Meats	2 728.2	5.4	0.82	-0.15	-4.1
Processed foods	5 249.0	10.4	0.32	-0.05	-2.6
Beverages & tobacco	2 402.1	4.8	-0.10	0.11	2.6
Textiles	1 343.4	2.7	-0.90	0.39	5.2
Clothing	2 383.0	4.7	-0.68	0.31	7.4
Leather	716.4	1.4	-0.91	0.61	4.4
Wood, pulp & paper	1 089.0	2.2	-0.75	0.53	5.8
Chemicals	1 942.3	3.8	-1.19	0.77	15.0
Refineries	1 642.0	3.3	-0.27	0.25	4.1
Steel	0.0	0.0	-1.99	1.23	0.0
Non-ferrous metals	0.0	0.0	-0.56	0.42	0.0
Motor vehicles	664.5	1.3	-2.38	1.54	10.2
Electronics	640.7	1.3	-2.19	1.11	7.1
Other machinery	992.4	2.0	-2.74	1.49	14.8
Electricity, water & other manufactures	391.7	0.8	-1.80	0.93	3.6
Wholesale, retail, restaurants, hotels, transport, communication	12 686.2	25.1	-0.40	0.33	41.9
Construction	0.0	0.0	-0.51	0.31	0.0
Business services	3 209.1	6.4	-0.08	0.15	4.8
Other services	8 859.8	17.5	-0.30	0.24	21.3
Total	**50 492.1**	**100.0**			**134.8**

source: model-based estimates

10. Implementation Stage 2: Screening and Scoping

10.1 Overview of screening

The purpose of screening is to identify those sectors or issues that are considered to be worth examining further to find if there is a potential causal link to a sustainability impact.

There are four criteria for selecting a sector or activity. The first is that a projected economic impact has been found that is sufficiently large to cause an economic sustainability impact. The second is that the previous analysis has projected an economic impact that is thought likely to lead to a change in production methods or relationships, from which a possible causal link can be made to a potential social or environmental sustainability impact. The third is that economic growth occurs in a sector where there is thought to be a direct link between output and environmental sustainability. The fourth is simply that there is reason to believe that the previous sector economic analysis needs reinforcement.

The approach to the screening and scoping process is examined at Section 4 above.

The economic impacts on the EU and other areas were discussed in the preceding section.

10.2 Screening for major output and employment impacts

In this subsection, we are looking for economic changes that are sufficiently large to constitute an economic sustainability impact. At macroeconomic level, this is a large change in output or employment or a decline in output or employment. At sector level this is either a large output or employment decline or a change to the structure of sector production that might lead to restructuring or 'frictional' unemployment.

First of all, we need to define what we mean by a large change in output and employment in the Chile context. Then we will compare these limits with the macroeconomic model projections.

If the EU-Chile Trade Agreement leads to growth that is at least equal to that experienced in a typical year's output or a good year's employment, this would seem to be of interest. However, in order not to exclude possible areas of interest, we are flexible in our interpretation of these limits. Annual average GDP growth in Chile over the period 1997-2001 was 4.5%, which would appear to be too stringent a test – see Table 8.1. Instead, it would seem reasonable that if the Chile-EU Trade Agreement led to output growth of 2.5%, this would be a significant economic sustainability impact. On the other hand, if the Agreement led to any decline in output, this also would be significant, as the policy change is intended to provide economic benefits to Chile.

For employment at the whole economy level, the limits of a significant impact were set at 1.0% growth, which was the average over the period 1997-2001. Any decline in employment over the whole economy would similarly be considered as being significant.

Since the output and employment in individual sectors must by definition grow and decline more readily than at the whole economy level, the sector limits of interest for structural change output will be put at 4% growth and 3% decline. For the purposes of discussion, the same limits will also be used as the limit of interest for sector employment. However, unless sector

employment makes up a large part of local employment, a greater percentage decline is usually required to create sustained employment difficulties. Slower growth or declines in major employment sectors can also be considered but these changes are less likely to be distinguishable from the normal economic cycle.

Table 9.1 showed that there is a small but noticeable improvement in both the EU's and Chile's real income (and by implication fixed capital formation). It is immediately clear that the economic impact is much too muted at macroeconomic to exceed the levels of interest set above.

Chile's sectors that were noted as increasing output most rapidly (but still in no case greater than 3.5%) were in descending order Processed Foods, Grains, Non-Ferrous Metals and Other Agriculture. Only in the case of Processed Foods might the scale and rapidity of growth mean that the sector is likely to show a significant economic sustainability impact. It is noted that this sector is inherently labour-intensive and is in most countries a major employer of female labour. The sector is thus identified under economic criteria as worth further study. This sector is also identified under other criteria below.

Sectors where output increased substantially in absolute but not necessarily as in percentage were Processed Foods, Construction, Other Agriculture and Chemicals. All of these sectors with the exception of Chemicals are employment-intensive. The behaviour of Construction is closely tied with that of the economy as a whole and so it is not considered further. Other Agriculture is discussed together with Processed Foods below.

It is clear from the analysis of the macroeconomic model results that the long-term structural effects on the Chilean labour market are both positive and, although fairly small, outweigh any negative temporary frictional unemployment. Since frictional unemployment is a negative social consequence, we consider it as a potential sustainability impact limited in time, despite its very small magnitude.

The Other Machinery sector experiences a fairly large decline in output in absolute but not percentage terms. The greatest percentage employment loss projected by the macroeconomic model is also in this sector, which approximately corresponds to the INE sector 'Fabrication of Metal Products, Machinery and Equipment' (sector 38, INE definitions). Over half Chilean employment in this sector is located in the Santiago Metropolitan Region, and while this region does have higher unemployment than most others (INE Estadísticas Territoriales), the estimated number of jobs lost in this sector in this region is of the order of 800 people. Similar numbers of new jobs are expected in this region in the INE sector definition of 'Food, Drink and Tobacco Manufacture'. This region accounts for about a third of the national employment in this sector, other regions with significant employment in this are I, V, VIII and X[29].

If there is a change in the relationship between sector exports and output, this could indicate a sector restructuring. The macroeconomic analysis found that in the Other Machinery sector and the relatively small sectors of Motor Vehicles and Steel, exports increased but not output. Sector consolidation could be possible in the Other Machinery sector; the employment consequences have already been considered above.

Overall, the expected geographical employment shifts are small, complex and not easily categorised as either beneficial or detrimental; there is no evidence for increased urbanisation as a result of the trade agreement. Local

[29] Chilean regions are commonly referred to in this way. This reference is to the following regions: Tarapaca, Valparaiso, Del Biobio, Los Lagos.

employment issues will not be considered further, except in the special case of fisheries.

10.3 Screening for change in sector structure or relationships

Under this heading, we are looking for sectors where is thought to be a possibility of a change in the structure of production, with possible implications for social or environmental sustainability. In particular, we are looking for situations in which possible changes in the structure of production may cause changes in the use of non-market resources or in non-market economic and social relationships.

The criteria for identification of structural change in a sector are generally qualitative. A sector that is directly opened to competition by the trade agreement would be likely to be identified here. A sector will be identified if sector economic growth or decline can be linked with a change in use of non-market resources such as common lands. Similarly it will be identified if sector economic growth or decline can be linked to a change in relationships between people who face each other in a number of different activities, including structural change in the gender division of labour. Finally, a sector can be identified here if there is evidence of change in its economic structure.

Since the **Mining and Fishing** sectors are opened to EU / Member State investment by the EU-Chile trade agreement, they are identified under this heading, despite the absence of projected growth in the Mining sector. The close links between Mining and **Non-Ferrous Metals** means that this latter will be analysed together with Mining. Pollution-related issues could be interesting in these last two sectors.

Processed Food is also identified under the structural change criterion because it is likely to be affected by the SPS (sanitary and phyto-sanitary) regulations in the EU-Chile Trade Agreement. Possible issues in this sector might include ensuring full implementation and monitoring of SPS regulations and pollution related issues. Implementation and monitoring of SPS is an especially important subject for study as this is effectively assumed in the development of the 'trade agreement' scenario. It would appear sensible to add **Other Agriculture** to the examination of SPS regulations.

Growth in the small **Grains** sector is projected to be fairly brisk, although the resulting output increase is fairly small. Nevertheless, the possibility that of consequent encroachment onto common lands, in particular (directly or indirectly) onto forestlands, means that this sector is identified and linked with **Forestry**[30], despite the absence of growth in the latter sector. The potential social and environmental consequences of sector expansion will be examined.

Comments made by interested parties and the literature review led the study team to ensure that the trade agreement's economic impact on the **Cattle, Textiles and Clothing** sectors could be analysed. However, the macro-economic projections show that little or no growth is projected in these sectors. These sectors are therefore not selected for further study on the basis of structural change. This is not to say that no sustainability impacts will occur in these sectors, only that such impacts are only likely to arise from non-market interaction with other sectors.

Similarly, the study team ensured that wines and spirits could be identified as much as possible within the **Beverages and Tobacco** sector. While this sector is expected to grow at a moderate pace of 1.4%, there does not seem to any indication of structural change by reason of growth. While the implementation of SPS regulations in this sector could be an issue, this is not

[30] See von Moltke 2002.

expected to be particularly different from the Processed Foods sector. Despite the difficulties in modelling the impact of the trade measures in this sector, we consider that the projections are of acceptable standard.

10.4 Screening for output growth where there is a potential direct link to environmental impacts

Under this heading, we are looking for sectors or activities where an increase in output scale has the potential to cause direct environmental impact. Whether it actually does so or not is considered once the sector is identified. The criterion for selection under this heading is total output growth, which can be modified if there is prior evidence of concentration.

Two activities are identified because of their close links with overall economic growth: **Transport and Electricity production**. While growth rates for both of these activities are projected to be very low, they remain of interest because of their general nature and because of links with the pre-existing urban pollution problem in Santiago.

Other growing sectors that were identified under this heading were **Chemicals**, for which output growth is estimated at $76mn. **Non-Ferrous Metals** (increase $38mn) is included because of its links with the previously identified Mining sector. At an output increase of $29mn, the **Wood, Pulp and Paper** sector is probably too little changed to be of major interest, in the absence of other evidence.

10.5 Screening for areas where previous economic analysis needs reinforcement

The computable general equilibrium analysis, while comprehensive, is not complete. For certain activities and sectors, the information gained from this analysis needs to be supplemented or corroborated by other methods. This situation arises because of data issues, which is the case with **services** and notably with **foreign direct investment**.

There are also some questions remaining about the data in the **Fisheries** sector, which was identified above.

While the macroeconomic impact of the EU-Chile trade agreement is expected to be fairly considerable in absolute terms if not in percentage growth, the possibility exists that for some sectors in some EU Member States, there will be a strong competitive impact. The possibility of this occurring is therefore identified for study.

10.6 Scoping

The objective of scoping is to determine the objectives and methods of the detailed studies that are intended to produce the information required for the social and/or environmental assessment of potential sustainability impacts.

The information used by the scoping exercise is the output of the screening exercise, which has established a link between the trade agreement under study and some economic consequences in the areas it considers to be of interest. Furthermore, the screening has developed an outline hypothesis as to possible causal links with sustainability impacts.

The reasons for the selection of each sector or theme are summarised in Table 10.1.

Table 10.1: Selection of sectors / activities for further analysis

Criterion for selection Sector / activity	1. Economic: output / employment	2. Other structural or relationship change	3. Direct output relation with pollution	4. Additional economic information required
Grains		✓		
Other Agriculture	(✓)	✓		
Forestry		✓		
Fisheries		✓		✓
Processed Foods	✓	✓	✓	
Mining		✓	✓	
Wood, pulp & paper			(✓)	
Chemicals			✓	
Non-Ferrous Metals		✓	✓	
Electricity, water & other manufactures			✓	
Wholesale, retail, restaurants, hotels, transport, communication			✓	✓
Tourism		(✓)	(✓)	
Business Services				✓
Other Services				✓

✓ Selected for further investigation under the criterion shown

(✓) Borderline case for selection

The output of the scoping exercise is the terms of reference for the sector studies. The terms of reference are designed to identify those sustainability issues that are related to the reasons for their selection, as given in Table 10.1.

The objective of each sector study is to undertake a preliminary sustainability impact analysis of the sector in question:

1. Identify any potential sustainability impacts that are consequent to the trade measures undertaken as part of the EU-Chile trade agreement. This identification should take into account the existing social, economic and environmental situation. In the case that the sector trade measures are considered to have consequences outside the sector, it is necessary to demonstrate the linkage in terms of the transmission mechanism in terms of shared resources or individuals or groups who face each other in a number of markets. The identification should be placed in terms of the indicators, scale and components of the sustainability impact, shown below in the section on Assessment.

2. Suggest, if appropriate, ameliorating (flanking) measures to improve the outcome. These measures may relate to actions not directly related to the sustainability impact, monitoring and/or implementation measures, or observations related to the interpretation of the EU-Chile trade agreement.

While in some cases it is prudent to enlarge the terms of reference to cover other related potential sustainability issues, this is not always the case. For example, in the case of services, two studies are identified. One services study looks at international trade in services with the perspective of reviewing incomplete information on the economic impact of the sector. The objective of this detailed study is to verify the economic results in this important sector, it does not provide coverage of social or environmental impacts. The results

could of course lead to a further examination of environmental or social sustainability issues in the traded services sector. The other services studies do just this, by covering domestic transport services and electricity generation in order to examine the impact on urban pollution.

In brief, the screening and scoping methodology permit the development of terms of reference for specialist subjects that are targeted to find the results of the questions identified. This can and has resulted in terms of reference for different sectors that have different objectives.

10.7 Grains, other Agriculture and Forestry

The Grains and Other Agriculture sectors each cover part of ISIC categories 1110 and 1120. The Forestry sector covers ISIC categories 1210 and 1220. The related Wood, Pulp and Paper sector covers ISIC categories 3311-3320 and 3411-3420.

Grains and Other Agriculture were sectors for which the CGE analysis projects increased output and, for the Other Agriculture sector, increased exports. In this analysis, we consider that the increased output of Grains will be delivered to final consumption within Chile as well as to sectors such as Other Agriculture and Food Processing. The increased output of Grains and Other Agriculture can be met by increased use of land, by more intensive agricultural methods, which require increased investment, or by both of these types of production changes. The study firsts examine which of these three situations is the most likely response to increased demand for agricultural products.

The study then examines whether any increase in agricultural use of land could place pressure for the incorporation of marginal lands into agriculture. If this is found to be the case, the study then examines whether there could be pressure to use forestlands for agriculture. For this reason, the Forestry sector is included in the sector study. If there is found to be pressure for the incorporation of forests into agriculture, the consequent possibility of an impact on indigenous peoples should be examined.

Some farms in Chile are family-based and in some cases use non-wage labour; in some situations farmers do not have full title to land; and some farmers may not market all produce. Many farmers do not have access to the capital required to change production methods. The impact of any increased commercial agriculture demand for land and/or the possible use of more land-extensive methods of production on land ownership and on social issues are studied. These social issues should include the potential for local exploitation of labour, and gender employment issues.

In the Grains and Other Agriculture sectors, there are possible impacts on production techniques of the sanitary and phyto-sanitary (SPS) agreements. Possible impacts on production techniques should be examined.

At this stage of the analysis, we have no evidence for or against any of these effects. The study therefore examines these sectors together, using the results of the CGE models and previous social and environmental case studies. It should be noted that von Moltke (2002), examined many of the environmental issues for Mercosur countries, although the land ownership situation and possibilities for pressure on forestry clearly differ from country to country. Similarly, WIDE (2002) wrote a number of case studies on the local social impacts of increased commercial agricultural activity in Mercosur countries. Again, it should be pointed out that social protection structures differ from country to country.

Possible relevant sustainability issues, including those raised in the above literature, include:

- Informal employment
- Gender employment
- Land rights
- Indigenous peoples
- Biological diversity
- Other natural resources stocks: forests
- Potential for ameliorating (flanking) measures and capacity to implement

10.8 Processed Foods, Chemicals, Non-Ferrous Metals and Mining

Processed Foods (ISIC 3113-3122), Chemicals (ISIC 3511-3529, 3551-3699) and Non-Ferrous Metals (ISIC 3720, 3811- 3819) are sectors that the modelling analysis has indicated to be likely to expand as a result of the EU-Chile trade agreement. Mining (ISIC 2100, 2200, 2301-2302, 2901-2909, 3530 (part of) 3540 (part of)) is a sector that is considered to have stable output as a result of the EU-Chile trade agreement. However, the opening of this sector to foreign ownership makes it an area of possible changes in production techniques.

All of these sectors are susceptible to produce air, water and land pollution. In Chile, there is an existing problem with urban air pollution. The expansion of the Processed Foods, Chemicals and Non-Ferrous Metals could lead to new production sites and thus to increased pollution (scale effect). On the other hand, the increased output required might lead to increased investment in newer, less polluting technologies (technology effect). While the modelling exercise suggests that there is not likely to be a scale effect in the Mining sector, increased foreign direct investment in this sector could imply a beneficial technology effect.

The study therefore examines the pre-existing pollution levels, the likely production response to the increased demand for Processed Foods, Chemicals and Non-Ferrous Metals and the potential for technical change in the Mining sector. On this basis, the study examines the potential for scale and technology effects on pollution indicators relevant to these sectors.

In these sectors, ensuring worker health and safety is of interest to responsible employers and workers' representatives. Expansion of these sectors could lead to temporary deterioration of the situation in these areas; or, through the use of new technology, to an improvement. In the Mining sector, the possibility of new investment could lead to improvements in worker health and safety. Given that the expected scale of output changes is not large, this is unlikely to be a major issue. However, the study briefly examines the existing and potential situation.

The impact of expansion in Processed Foods sector employment is briefly examined from a gender perspective.

In the Processed Food sector, there are possible impacts on production techniques of the sanitary and phyto-sanitary (SPS) agreements. Possible impacts on production techniques are examined.

The methods to be used are the application of existing relevant case studies and communication with sector representatives.

Possible relevant sustainability issues raised by the above discussion include:

- Environmental quality: air, water and land quality
- Employment: health and safety – importance to be verified
- Employment: gender employment in Processed Foods sector – importance to be verified

10.9 Fisheries

The GTAP modelling exercise projects growth in output and long-term employment for this sector, which covers ISIC categories 1301-1302. The sector does not export much directly, instead delivering to the processed food sector. Fisheries output growth is thus responsible for some of the Processed Food export growth.

There are two major trade measures in the EU-Chile trade agreement relevant to the sector. Firstly, EU tariffs on fish and (processed food) fish products will largely be eliminated either immediately or over a period of up to 10 years. For some items, this is achieved through the introduction of a tariff quota that, for most products, increases to cover all imports in the relevant category over a transition period. A few tariffs and tariff quotas will remain at the end of the transition period, though the vast majority of products are covered by the agreement. Since the previous tariff levels were significant in many cases, this trade measure is expected to have a very significant impact on Chilean fish and fish product exports to the EU. In terms of economic impact, this is the most important trade measure in the fishing sector. The second trade measure in this area is the enabling of EU Member State companies to invest in the Chilean fishing industry, including in fishing boats, provided that Chilean companies are reciprocally permitted to invest in that Member State's fishing industry. The SPS agreement will also have a positive effect on this sector by facilitating exports to the EU.

The model growth projections are compatible with the fixed Chilean fish quota because the growth of output is projected in value and not volume terms.

In discussion with sector experts, the study team has understood that Chilean statistics on the fishery sector, including its economic data, fully cover the physical and economic activities in Chile's waters. Since the model projections are based on this data, this information gives the study some assurance that the model projections are based on an appropriate representation of the sector.

The sector study should start by checking the GTAP sector projections against other information available. This entails an analysis of the likely sector output and long-term employment changes as a consequence of the EU-Chile trade agreement using methods other than macro-economic modelling. The methods used include consultation with fisheries representatives and an examination of existing case studies, if any.

This economic analysis is required for two reasons. Firstly, while the GTAP results are compatible with the fixed fish quota, they may not fully incorporate this in the model parameters. Secondly, while the Chilean economic data may well be accurate, the fact that other countries' fishing data may be incomplete may mean that economic relations in this area are not covered as fully as in some other sectors.

As previously noted, the output of the first part of this study is a projection of sector output and employment, which may serve simply to validate the projections made by GTAP or may differ in some ways.

On the basis of the sector employment forecast, an analysis of the employment impact at local level should then be made. Even though, as in the GTAP projections, the forecast may be for long-term growth in sector employment, this does not exclude local reductions in employment as a result

of changed production methods (fewer, more efficient fishing-boats using fewer ports, for example). In this situation, the existing local employment situation is to be examined.

To the extent that local negative impacts are found, especially in the case that there is high existing local unemployment, the study proposes ameliorating (flanking) measures.

The only possible method for examining the local economic impact is through discussion with fisheries representatives and use of existing reports.

10.10 Transport, electricity and air pollution

The GTAP modelling exercise projects that Road transport (part of the Wholesale, retail, restaurants, hotels, transport, and other communications services sector, which covers ISIC categories 6100-7200) and electricity, part of the Electricity, Water and other Manufactures sector which covers ISIC 3901-4200, to grow slowly, at slightly below that of output as a whole. For road transport, this is perhaps an unexpected result.

Both of these sectors are potential contributors to air pollution, mostly in urban areas, which is a pre-existing issue in Chile. The potential for increased output (scale effect) the introduction of new equipment (technology effect) are discussed for both sectors.

The low growth projected warrants only a brief review of the literature.

10.11 Trade in services

There are known issues linked with the measurement of trade in 'traditional' services and even more with the measurement of Foreign Direct Investment (FDI) flows and with intellectual property transfers that are linked with FDI and with trade in other goods and services. Foreign Direct Investment may also lead to production changes, even where this is not accompanied by imports of capital goods.

For these reasons, the GTAP modelling exercise is supplemented by a sector study that examines the likely changes in:

- Trade in services (measured as such)
- Foreign Direct Investment from EU to Chile, both within the services sector and elsewhere within the economy
- Transfer of intellectual property, whether correctly measured or not

The study concludes with:

1. An estimate of changes in EU-Chile trade in services (measured as such). This can be a simple validation of the GTAP projection, if no further information is found.
2. A qualitative estimate of the increase in FDI from EU to Chile as a consequence of the trade agreement, if the information available can support such an estimate.
3. A qualitative examination of the consequent impacts of this additional FDI on the Chilean economy.
4. An indication as to the underlying change in the scale of intellectual property transfers as a result of the agreement.

Given the resources available, the limited data covering these issues and their complexity, the study uses existing information, case studies and discussions with experts. The study indicates where qualitative but not quantitative conclusions can be drawn.

10.12 EU sector impact

While the impact on the EU economy of the Chile trade agreement is small in percentage terms, it is possible that for some countries and sectors, there may be a significant impact. This study looks at the impact of the EU-Chile trade agreement on the EU Members States sector trade. To the extent that significant evolutions are highlighted in any sector, the frictional employment implications are examined.

10.13 Cattle: A sector not selected for further study

The Cattle sector was closely examined for further study due to the possibility of consequent encroachment onto common lands and in particular (directly or indirectly) onto forestlands.

The sector was therefore specifically identified in GTAP and considerable liberalization was assumed in the model runs. The GTAP results were for a very small projected output increase. For this reason, it was considered unlikely to have significant sustainability impacts.

Later information provided to the study team considered that: 'According to national authorities (DIRECON, 2001), beef exports are expected to increase as a result of the tariff free quota of 1000 tons of beef. The quota will increase by 100 tons of beef per year. Given that this quota corresponds to 15% of the actual local production, it is likely that there will be increases in production and exportation in the near future.'

While this precise information was not available to the study team at the time of the pre-screening GTAP model runs, beef production levels were examined: according to the INE Chile 6th Agricultural Census (www.ine.cl), there are 4m cattle (milk and meat) in Chile, 160 000 farms (respondents) and 15m hectares under cattle. Existing exports to the EU are very limited.

While we consider that the reasons for rejection are valid, we are also aware of the potential sustainability impact, as noted by the IEP[31]:

> 'The expansion of the beef industry can cause the following impacts: a) A change in land uses due to the increased demand for grazing land reducing the land available for crops used to cultivate goods for direct human consumption; and b) An increase in industrialization of agricultural activities that are not well regulated under sanitary codes. This may create damaging impacts on the quality of agricultural products and natural resources. In addition, it provides incentives for unsustainable and unsanitary agricultural practices, such as those that generated the crisis of BSE in Europe' (*Bovine Spongiform Encephalopathy*).

The possibility of a similar change in land use was examined in the study on grains and other agriculture.

10.14 Other Machinery: A sector not selected for further study

The Other Machinery sector represents almost 4% of total Chile output and that will undergo an output reduction of 2.1%, valued at almost 100 millions dollars. As with the sectors that are stimulated by the Trade Agreement, this decline in sector output is less than one year's decline in a normal economic cycle.

The Other Machinery sector is projected to experience a fairly large decline in output in absolute but not percentage terms. The greatest percentage employment loss projected by the macroeconomic model is also in this sector,

[31] Instituto de Ecología Política.

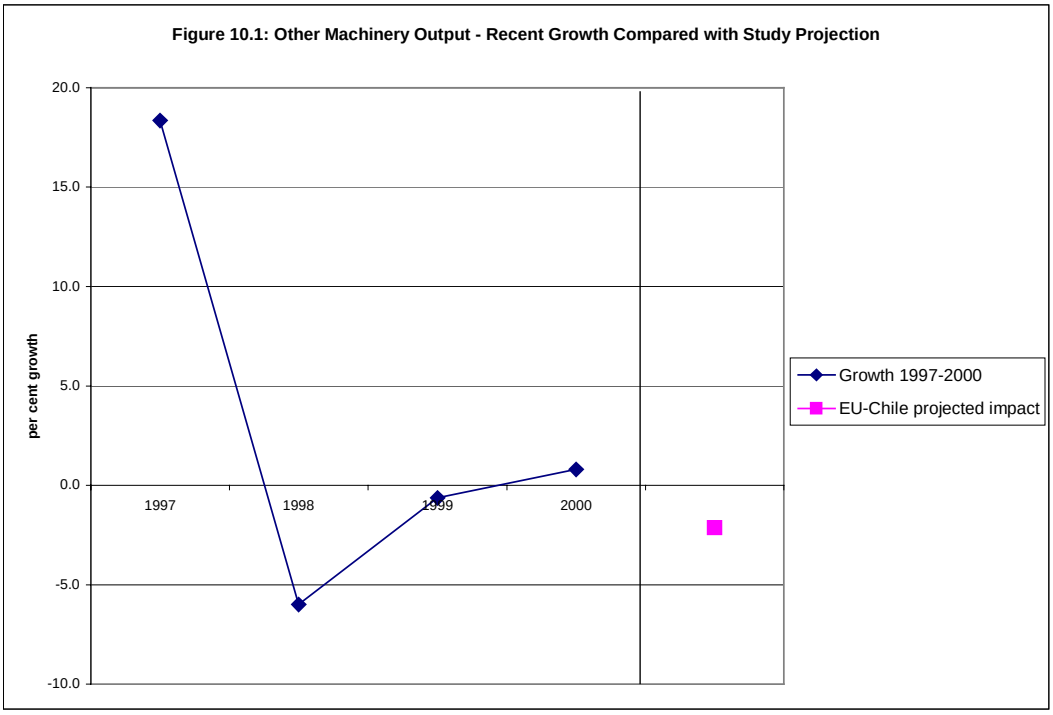
which approximately corresponds to the INE sector 'Fabrication of Metal Products, Machinery and Equipment' (sector 38, INE definitions). Over half Chilean employment in this sector is located in the Santiago Metropolitan Region, and while this region does have higher unemployment than most others (INE Estadísticas Territoriales), the estimated number of jobs lost in this sector in this region is of the order of 800 people.

The decline in output of the sector is due to its comparative disadvantage in trade with the EU. The combination of reduced tariffs in this sector and increased demand leads to a fairly large increase of 4.6% in imports, balanced by a similar percentage increase in Chile's exports.

The reduction in output is less than a year's normal growth. The loss of employment is small and not concentrated in a low employment area. The loss of employment is more than counteracted by employment increases in other sectors in urban locations.

It is perfectly normal for a sector to contract by less than a year's normal growth when open to more competition. There does not seem to be any scope for social or environmental consequences or for a loss of industrial skills.

Figure 10.1: Other Machinery Output



These points are illustrated in Figure 10.1. This compares recent growth in the sector, as defined by INE-Chile sector 382 Machinery, except electrical calculated from the index of physical production of manufacturing industry, with the projected decline in output as a consequence of the EU-Chile trade agreement. The past data is drawn from the INE-Chile publication *Compendio Estadistico 2001.* It should be noted that the full impacts of the EU-Chile trade agreement are likely to come into effect in a period considerably longer than one year. While the recent data is not defined in exactly the same terms as the basis for the projections, the definitions are similar enough to make valid comparisons.

For these reasons, the sector is not selected for further study.

10.15 Social and Environmental consequences of expected developments in services and FDI

As outlined in section 10.11 *Trade in services* above, Chapter 15 examines the projected economic developments in services and summarized the projected changes in foreign direct investment (FDI) as a consequence of the EU-Chile agreement. This section screens / scopes the potential social and environmental outcomes of that section.

Even though a number of services are expected to grow at above the average economic impact of the EU-Chile trade agreement, it is not thought likely that the additional growth will be so rapid as to bring about structural economic change with sustainability implications.

With a few very important exceptions, developments in services do not normally have a significant direct impact on environmental indicators. The important exceptions to this include transport-related services. The impact of changes in Land transport on environmental sustainability is examined in section 14.

While there remain difficulties in measuring international transport as outlined above, we consider, as explained in the analysis of express services at section 15.5.1, that air transport will grow faster than the overall impetus to the Chilean economy from the Chile-EU trade agreement. However, the base level of air transport is still at a relatively low level in Chile and the additional growth as a consequence of the EU-Chile trade agreement is not expected to be sufficiently large to warrant specific attention. Nevertheless, there is a clear expectation of an environmental impact on air quality. This could be seen as being qualitatively similar to that expected the Land Transport sector, examined in section 14.

A second major potential area of interest is that of tourism. On the one hand, the direct impact of the EU-Chile agreement is expected to be low, as there are no specific liberalisation measures affecting this sector. On the other hand, economic growth can be expected to lead to increased domestic tourism and increased trade generally could expand the travel market and so bring down costs. Moreover, tourism utilises a non-market resource, the natural environment, and so an increase in demand for tourism identifies the sector under screening criterion 2: *Other structural or relationship change*.

The potential for large-scale tourism to lead to degradation of the local environment is quite well known. Screening Criterion 3, *Potential for Environmental sustainability impacts caused by changes in the scale of production*, thus also identifies the sector as worth investigation. Given the sensitive nature of Chile's natural environment, a limited examination of the potential for increased tourism leading to an environmental impact is given at section 14.3.

In addition to the direct effects of services development, there may also be indirect social and environmental effects in urban areas as services are overwhelmingly urban-based. Two of these effects, electricity and land transport, are examined in section 14. Additional possible effects are increased strain on public services from in-migration from outside the main urban areas. However, since there is expected to be a smaller loss of urban employment in manufacturing industries such as other machinery, steel and motor vehicles, we do not see increased employment in services as a major 'pull' factor encouraging rural-urban migration.

This is not to say that we do not see rural-urban migration occurring for other reasons: as often elsewhere in this study, it is necessary to draw the distinction between what is occurring as a consequence of general economic development and the specific consequences of the EU-Chile agreement.

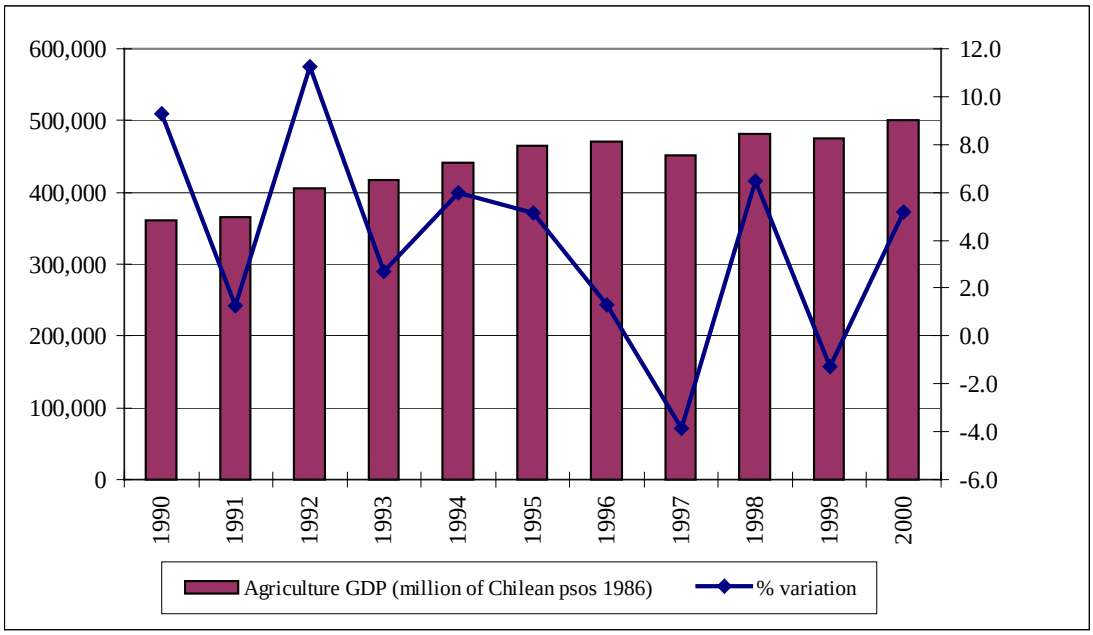
11. Sector study: Grains, Other Agriculture and Forestry

11.1 Grains and Other Agriculture

- **General Overview**

Over the last decade, the agriculture sector's share of Chilean GDP has fallen from 8% in 1990 to 5.9% in 2000. In spite of this, over the period 1990-2000 the sector's average annual growth was positive, around 1.5 percent (the economy grew around 6.7% in the same period). In the relatively short period from 1996 to 2000, a period of low economic growth rates in Chile due to the international crisis, the value of goods produced in the sector grew around 3%, similar to the nation's growth in the same period. Thus, the agriculture industry has kept its place in the economy, contributing about 6 percent of GDP in this period. See Figure 11.1 below.

Figure 11.1: Agriculture Sector GDP



Source: Banco Central de Chile (1996, 2001)

The agriculture sector groups several products and so their development has not been homogeneous over the last decade, as shown in Figure 11.2. Specifically, it can be seen that the areas planted with grains have decreased over recent years.

The Chilean economic openness policy of the last decades has led to a sustained increase in the international trade in agricultural products. Agricultural and forest international trade between Chile and the world has experienced a remarkable increase during the last decade: of an exchange of US $2.4 billions in 1990, to US $6.2 billions in the year 2000, an increase of 158%.

In the year 2000, the agriculture exports of Chile to the world attained US$5 billions, 144% more than in 1990. Imports in the sector have also increased

by US $1.2 billions or 238% over the same period. As a consequence, the agricultural net trade surplus has increased by 124% over the decade, as it increased from US $1.7 billions in 1990 to US $3.7 billions in the year 2000. Despite this, the sector structure of Chile's exports has not shown considerable variation from 1990.

Of the whole agricultural sector (farming, forestry, cattle), the exports of the farming sub-sector are the largest. These totalled US $2.6 billions in the year 2000, accounting for 53% of sector exports, as shown in Table 11.1. The forest sub-sector is second in importance, with production of US $2.1 billions in 2000, accounting for 43% of the total of sector exports. The cattle subsector has the smallest share of sector production at 4%, has experienced the fastest growth over the decade at an annual average of 11.2%, while the agricultural and forest exports grew annually by 8.6% and 10.2% respectively.

Table 11.1: Agriculture Exports by Sub-Sector 1990–2000

(millions of US $)

Subsector	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	1990/ 2000
Agricultural	1 156	1 507	1 660	1 541	1 721	2 095	2 510	2 458	2 729	2 738	2 628	127 %
Cattle	67	73	69	65	103	113	116	164	169	165	192	187 %
Forest	807	838	1 039	1 097	1 451	2 266	1 544	1 648	1 434	1 818	2 137	165 %
Total	2 030	2 418	2 768	2 703	3 275	4 473	4 170	4 270	4 332	4 720	4 957	144 %

Source: ODEPA (2001)

Agriculture exports have shown an important geographical diversification. In 1990 the number of destination countries reached 100, while in the year 2000 this was 145. The number of exported products increased from 417 to 528 in the same period.

During the year 2000 the forestry and the fresh fruits products accounted for 70% of the total value of Chile's agriculture exports. This share is 5 percent less than the situation of 1990, mainly because of the smaller amount of fresh fruits exported (from 35% to 27%), and the slight increase of forestry exports during the last decade (from 40% to 43%).

The fruits and processed vegetables have maintained their export share, in the last decade, oscillating between 8% and 13%. On the other hand, the subgroup of wines and alcohol has shown strong growth.

In terms of exports destination, the Asia-Pacific area (APEC) is the main destination of Chile's exports. In the year 2000 it was exported toward those countries 56% of the total of exports (US $2.8 billions), while in 1990 the exports toward them only totalled US $964 millions, 47%.

The shipments dispatched to the European Union have shown growth from US $585 millions in 1990 to US $1.2 billions in 2000, with a average growth of 7% per year. However, the importance of this economic block has shown a significant decrease. While at the beginning of the decade 29% of total exports went toward this area, in the year 2000 shipments toward Europe only represented 24% of the total. Following the trade the agreement, it is expected that this situation will change drastically.

The exports directed to MERCOSUR rose in 2000 to US $345 millions, while at the beginning of the decade they only accounted for US $172 millions. This

implies annual growth of 7%. Despite this growth, the relative participation of this area has stayed relatively stable, near to 7%.

In general, it is possible to conclude that Chile has been taken full advantages of its economic openness and free trade agreements.

Table 11.2 shows that non-traditional agriculture and forestry have displaced traditional farming activities over the last decade. In this context, if the trend is maintained, the increased demand for agricultural products is likely to be met by more intensive agricultural methods, which require increased investment. The process of improving production techniques in the sector has already been used. Thus, according to the Central Bank of Chile, Labour Productivity in the agriculture sector has increased by about 32% during the period 1996-2001. This increase in productivity can explain why agricultural output has increased in the last decade, accounting for the fact that prices have markedly decreased due to the economic opening and liberalisation process of the sector in recent years. The introduction of new technologies, training programmes, private investment and governmental programmes of soil recuperation have no doubt caused this movement in the supply curve, which has occurred in response to increased openness to trade and has led to loss of employment in the sector.

Table 11.2: Changes in the use of Agricultural Land

Agriculture Use	Area (ha) 1988	Area (ha) 1999	Total Variation	% Variation
Annual farming (1-year crop cycle)	1 074 500	775 794	- 298 706	-27.8
Fruits and vineyards	236 860	300 859	63 999	27.0
Flowers and vegetables	70 180	91 241	21 061	30.0
Artificial grassland	374 610	424 660	50 050	13.4
Natural grassland	3 853 880	3 108 978	- 744 902	-19.3
Forest Plantations	1 181 898	1 737 030	555 132	47.0

Source: ODEPA (2001)

- **Environmental Issues of Concern**

The are some very significant environmental issues of concern in the agriculture sector, such as:

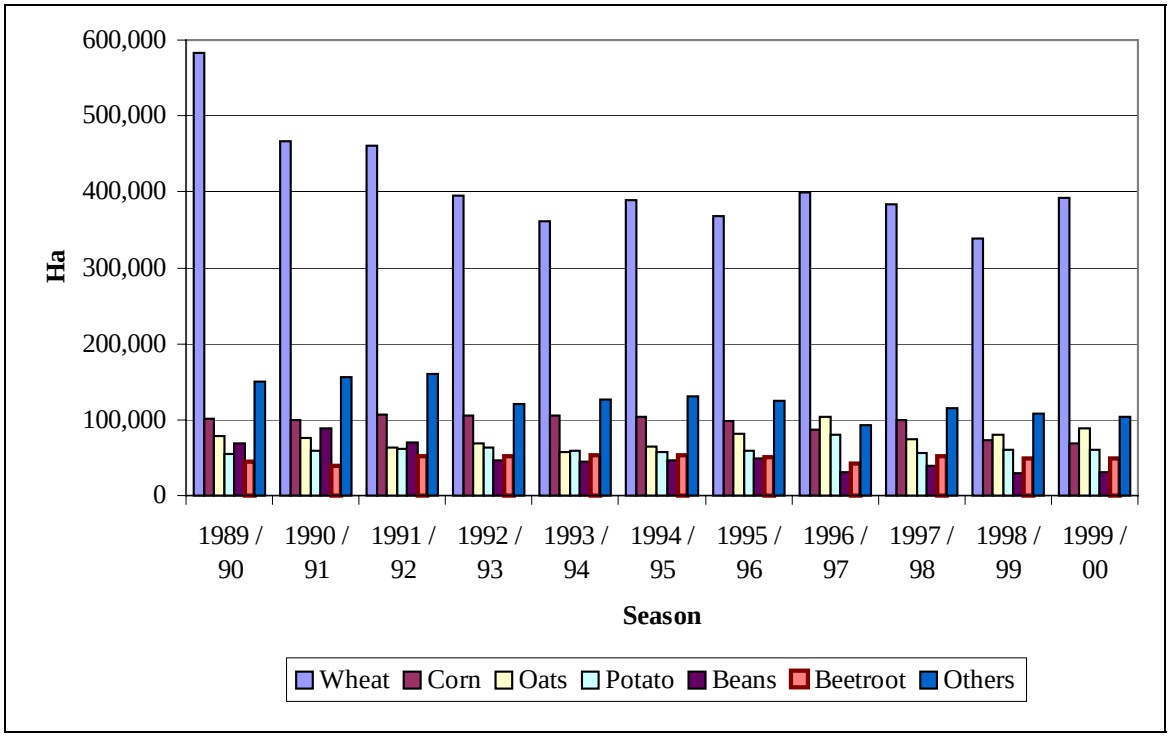
- Pollution caused by incorrect application of pesticides in agriculture
- Erosion and loss of agriculture soil because of bad management

Concerning the use of pesticides in agriculture, agricultural production in Chile has usually required lower rates of pesticides compared to other countries, due to some natural advantages in controlling diseases (Gonzalez 1994[32]). However, in less than 15 years the use of agrochemical products has tripled, from a volume of imports of 5 577 tons per year to 15 350 tons year in 1997 (Celis y Letelier 1999[33]).

[32] GONZÁLEZ, S. (1994) "Estado de la contaminación de los suelos en Chile", in: Comisión Nacional del Medio Ambiente, "Perfil Ambiental de Chile.", Santiago, Chile. pp 199 – 234.

[33] CELIS, A. and LETELIER, E. (1999) "Ruralidad, Agricultura y Sustentabilidad", in Larraín, S., Larraguibel, C. and Reyes, B. (editors) "Por un Chile Sustentable: Propuesta ciudadana para el cambio", Santiago, Chile. 486 p.

Figure 11.2: Areas Planted



Source: ODEPA (2001)

Indeed, in recent years, with the export-led policy concentrating upon non-traditional agriculture exports -mostly fruits- an increase of toxic substances has taken place. The use of pesticides, fertilisers, and other substances to preserve or improve the appearance, texture and longevity of the products has been on the rise. Many of these substances are widely employed in industry. Currently, there is a governmental programme, operated by the Chilean Agriculture Agency (SAG) that aims to regulate and monitor the use of pesticides in agriculture.

A related problem caused by the increase of agriculture has been the salinisation of soil, due to the greater intensity in the use of water for agriculture irrigation. The increased salt content in the soil has provoked continuous loss of soil productivity mainly in the north of the country, where the process of evaporation-and-transportation facilitates salinisation.

The second issue of concern is the erosion and loss of agriculture soil because of bad management and agricultural practice. Indeed, one of the most direct environmental impacts of agriculture is soil degradation. Most of the fragile ecosystems currently used in agriculture are at risk of being degraded (Universidad de Chile 1997[34]). Thus, eroded soils in Chile have increased from 45.7% of the total during the 1970s to almost 60% during the 1990's, (Universidad de Chile 2000[35]).

Besides the geographical and climactic conditions of Chile's territory tendency to generate an erosion problem, the over-exploitation of land historically has notoriously contributed to soil degradation. A clear example of this situation is

[34] UNIVERSIDAD DE CHILE (1997) "Diagnóstico de la desertificación en Chile" Corporación Nacional Forestal y Ministerio de Agricultura. Santiago, Chile. 399 p.

[35] UNIVERSIDAD DE CHILE (2000) "Informe País. Estado del Medio Ambiente en Chile – 1999", Centro de Análisis de Políticas Públicas. Santiago, Chile. 409 p.

the Araucania Region, particularly Malleco Province, where 390 660 ha. are inhabited and used by the indigenous Mapuche population. Continuous displacement of the population and the use of primitive technologies in agriculture have contributed to the erosion of vast areas of land.

The loss of agriculture lands caused by dunes in Chile's central coastline is also an issue of concern for the agriculture sector. This environmental concern leads also to a social issue regarding loss of valuable natural heritage and soil productivity.

RIDES (see section 23.2.5) points out that 'erosion is a problem caused by traditional crops in the Araucania Region'. A reduction in production of these crops will not necessarily reduce erosion.

- **Social Issues of Concern**

Agricultural unemployment is closely related to that for the country as a whole, as shown in Figure 11.3. Three factors are at work to produce this relationship: the market-orientation of agriculture, its increasing productivity and its status as a low-paying employer and thus probably often of employer of last resort.

Figure 11.5 shows that most farms in Chile are smaller than 5 hectares, while there are just a few farms greater than 2 000 hectares. This situation reflects that some farms in Chile are family-based and in some cases use non-wage labour. In some situations, farmers do not have full title to land; and some farmers do not market all or any produce. Furthermore, many farmers do not have access to the capital required to change production methods.

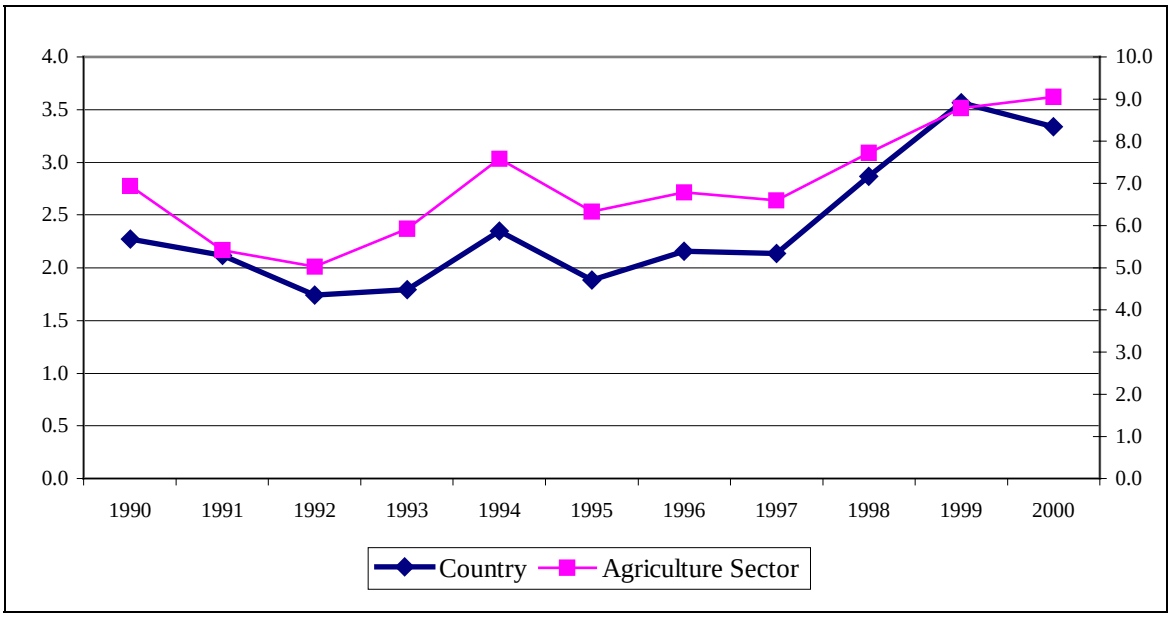
According to the ILO LABORSTA database, in the year 2000, women made up 10.5% of employment in agriculture. This is clearly only a partial measure, as self-employment and non-wage labour are major occupation types in non-industrialised agriculture. We have not found any land ownership data that identifies the gender of the owner. Therefore more than a very partial account of gender-specific impacts on the sector does not seem currently possible. Since women's participation in formal agricultural sector employment is so low, it would seem that economic impacts in the agricultural sector would be very likely to have a differential effect on men and women.

Agriculture is the main activity of indigenous peoples, as shown in Figure 11.4. Any negative consequences for small-scale agriculture are therefore very likely to affect these peoples.

- **Economic Sustainability**

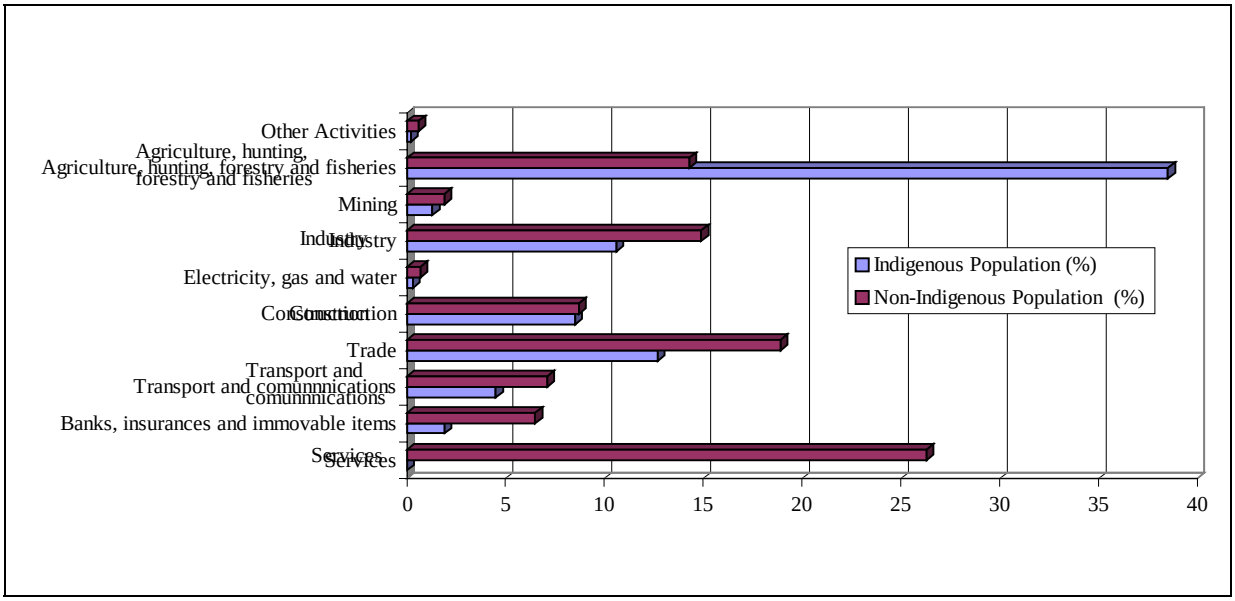
Grains and Other Agriculture were sectors for which the CGE analysis projects increased output and, for the Other Agriculture sector, increased exports. In this analysis, it is considered that the increased output of Grains will be delivered to final consumption within Chile as well as to sectors such as Other Agriculture and Food Processing.

Figure 11.3: Unemployment Rate: Agriculture Sector and Economy



Source: Meller, 1999

Figure 11.4: Indigenous Population by Economic Activity

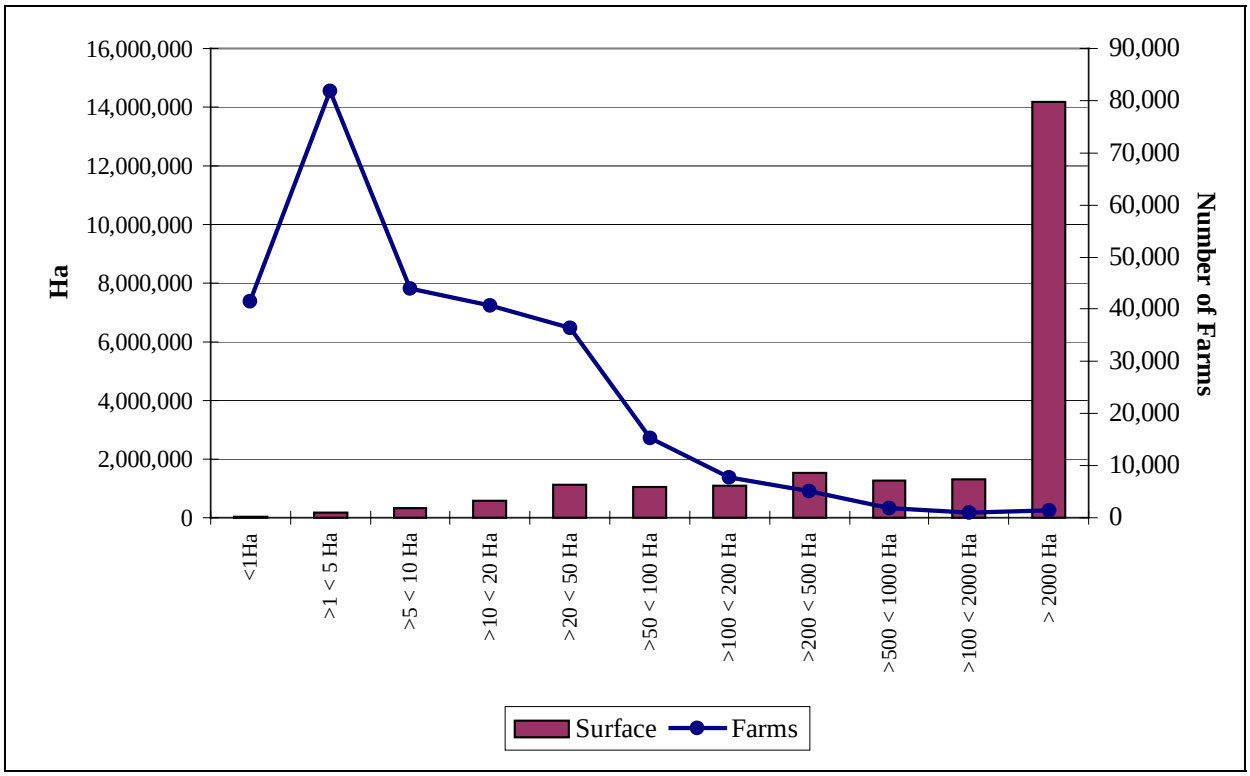


Source: Ministerio de Planificación (2001)

The results of the GTAP simulations show that the output of grain and other agriculture sectors are expected to grow by 2.21% and 1.89% respectively as a result of the EU-Chile agreement. In this context, it is important to note that growth in the agricultural sector between 1990 and 2000 has been about 1.5% annually, compared with 6.7% annual GDP growth for the same period. Output of the grain sector has actually decreased in recent years. Another point to be taken into account is that Chile's agricultural sector has

consistently liberalised its international trade over the last 20 years, so that a major proportion of sector exports are already subject to no tariffs. In any case, all comparisons must be made with care due to the differences in sector classifications used by GTAP and the Chilean Central Bank, the origin of the data used in this section.

Figure 11.5: Surface Area and Number of Farms by Size



Source: ODEPA (2001)

Since productivity is likely to continue to grow in commercial agriculture, an increase in demand for agricultural output is more likely to result in increased agricultural intensification than in pressure for incorporation of marginal lands or forestlands into commercial agriculture. Experience may vary according to local conditions but intensification of agriculture and the consequent decline in areas under wheat is already the overall trend.

As the productivity of large-scale farms increase, the ability of small-scale farmers to compete with them in marketing produce is likely to decrease as productivity gains will be generally limited to larger farmers who are able to access finance for development. This is an existing trend that is reinforced by the increase in demand engendered by the EU-Chile trade agreement. In the short run, given the current international price levels in the sector, most efforts are put in maintaining current production levels and thus avoiding bankruptcy. In this scenario, small farmers are likely to be increasingly confined to producing for their own consumption and to be priced out of marketing their produce. In the medium and long term, these trends are likely to lead to the integration of small producers into larger holdings. This will permit an increase in the scale of production in the agricultural sector and thus higher output.

Equally, intensification of commercial agriculture is likely to have an impact on agricultural unemployment. As has already been noted, the increase in demand from the EU-Chile trade agreement will have a positive impact on small farm employment, when compared with the situation without the

agreement. This effect is projected by the GTAP analysis. However, the impetus given to further agricultural intensification and thus increased productivity is expected to lead to a subsequent loss of employment in the agricultural sector. This technique change effect is not captured by GTAP. While it is difficult to compare these two employment effects in quantitative terms, we consider that the productivity effect will probably outweigh the demand effect, so leading to higher sector unemployment. Since sector unemployment is associated with general unemployment, the effects are likely to be felt outside the sector.

While a loss of agricultural employment is a common result of development and the associated consumer benefits from lower agricultural goods prices are not to be ignored, a loss of rural employment is an extremely serious issue for the people affected. There is unlikely to be an alternative source of employment and so 'frictional' unemployment is likely to be highly persistent, at the very least. If small farmers do not have clear title to land and the means to benefit from their assets, they may be obliged to abandon their land.

Due to the gender-related division of labour in small-scale agriculture, the loss of 'employment' will have a gender-differentiated impact. Given the information available, there is little more that can be said in this area.

As agricultural employment is the major occupation of indigenous people, a fall in rural employment opportunities will have negative consequences for this group.

- **Sustainability Impacts and Mitigation Measures**

Table 11.3: Summary of sustainability impacts for the Grains and Other Agriculture sector

	Dimensions / Significance Criteria					
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C.1	Equity: Gender C.2	Revers-ibility D	Capacity to change E
I Economic						
1. Real income	△	?	▽	?		
2. Net fixed capital formation	△	△	▽			
3. Employment	?▽	▽	▽	?		↕
4. Consumer effects	▽	△				
II Social						
5. Poverty	▽	▽				△
6. Health and education	▽	▽				△
III Environmental						
7. Environmental quality	▽	▽				△
8. Biological diversity	○					
9. Other natural resource stocks	▽	▽				△

For explanation of symbols, rows and columns, see Section 5 or Section 19.

Chile has previously experienced processes of international integration, increasing competition, exports, productivity, and output. What is expected for the future and the impact of the EU-Chile agreement are not qualitatively different to what has been seen before.

The two major sustainability issues that affect the sector concern the intensification of commercial agriculture. This trend is not fundamentally caused by the EU-Chile trade agreement but the agreement adds to its effects. The consequences of the trade agreement clearly interact with existing trends to cause probable sustainability impacts.

The Agreement will increase demand for agricultural produce. In the medium term this demand will be provided by the more economically efficient intensive farming methods as these lead to lower cost produce.

The first, environmental, sustainability impact involves salinisation, chemical residues and erosion of the soil. The consequences of the agreement may add to existing problems of salinisation and possibly erosion, though increased concentration of commercial farms might have the opposite effect on erosion. The overall environmental impact is, however, expected to be negative.

The second sustainability impact involves the long-term trend towards larger scale intensive commercial farming that will render marketing of produce by small farmers unviable. The EU-Chile Agreement may help small farmers in the short term but in the medium term it will add to the existing trends of agricultural intensification. Both the present extent of small-scale farming and the probable long-term underemployment that many small farmers will face unless alternatives are found are unsustainable.

As the sustainability impacts are closely related to existing effects, the mitigating measures must address the underlying situation. The following approaches are proposed:

- The enforcement of current norms about pollution caused by pesticides in agriculture must be reinforced. This is most important in periods of low economic growth and high unemployment, when environmental standards can easily lose political support
- Over the last decade, several programmes have been implemented in order to control and reverse the increasing soil degradation in the country. If agricultural production is about to grow, support for similar programmes must be increased. Current subsidies and incentives must be re-evaluated in this context, as must the infrastructure aimed at improving irrigation in the country.
- Efforts should be orientated towards promotion of environmental production methods and social conservation. On possibly is that the country cannot avoid some form of regulation or constraint on agricultural development, so that natural resources management responds to some long-term objectives.
- The impact of agricultural intensification on the ability of small farmers to achieve a sustainable livelihood needs to be mitigated by ensuring that their existing assets and skills are valued and by opening new opportunities. Therefore a mitigating measure should take the form of helping small farming communities to establish their title (individually or collectively) to land where this is lacking. This is a very important measure toward limiting rural poverty, exploitation and achieving a sustainable livelihood. Other Mitigating measures include enabling small farmers to have access to markets and to finance. Further flanking measures should address the acquisition of new skills. Since we think that the situation is different for men and women, differentiated approaches may be appropriate.
- A further issue is how to address possible changes in the numbers and position of agricultural workers as a consequence of the EU-Chile trade agreement. Recent social impacts on agricultural labour have been far

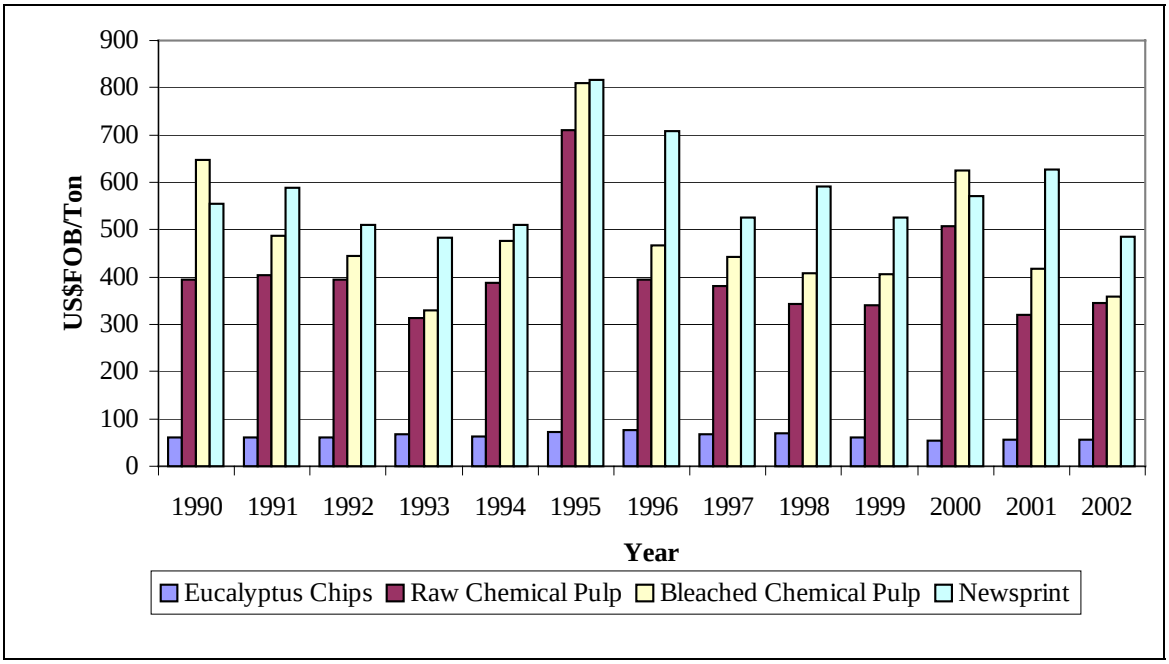
from friendly to workers and their families, mainly because of labour instability and the lack of social support for these groups (schools, health care, basic infrastructure, etc). In these circumstances, agricultural workers attempt to keep farming their own land in a 'subsistence economy', even though this is very inefficient and is likely to become increasingly unsustainable, with or without the trade agreement. A possible objective is to improve and enhance the labour market regulations for part-time agriculture employees ("temporeros"), aiming towards a more modern and fair legislation and social framework, benefiting from European experiences and regulations.

11.2 Forestry / Wood, Pulp & Paper

- **General Overview**

One of the most dynamic productive sectors in the Chilean economy is the forestry sector. During 1984-92, the forestry sector (as defined by the INE and which includes forestry and wood, pulp and paper processing but excludes furniture making), had an average annual growth rate of 9 percent, which was substantially better than the 7 percent growth for the economy as a whole, see CIPMA (2000). In the period from 1984 to 1996, the value of goods produced in the sector more than quadrupled, increasing from US $575 million to over US $2.4 billion, of which 61 percent was exported. However, in the period from 1997 to 2000, the value of goods produced in the sector grew by around 3%. This reduction in the growth rate has been caused by the international economic crisis and the lower international prices for the main sector's exports, as shown in Figure 11.6. This shows both the traditional cyclical fluctuation and the considerable price decline in recent years. Despite the changes in growth rates, the forestry industry has maintained its relatively small share of the economy, contributing about 3 percent of GDP.

Figure 11.6: Nominal Export Prices for Chips, Pulp and Newsprint



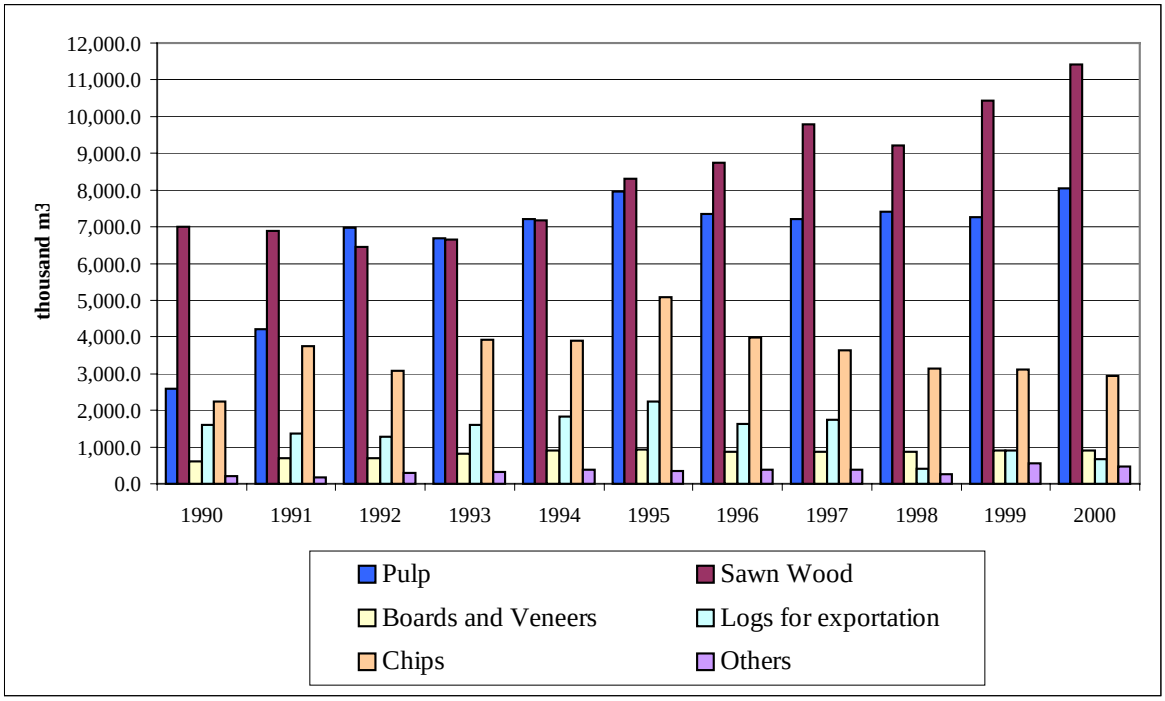
Source: ODEPA (2001)

There are three distinct production phases in the forestry sector: 1) extracting wood from forests or plantations; 2) processing wood; and 3) transporting the product to processing plants.

- *Harvesting***.** In 1997, Chile's territory included 15.5 million hectares of forest; of which about 13.4 million hectares were native forest and 2.1 million hectares were plantations. In 2000, the industrial timber harvest reached 24.4 million cubic meters, almost 10 million cubic meters more than in 1990, as shown in Figure 11.7. About three quarters of timber harvested is *Pinus radiata*, as shown in Figure 11.8. Productive forest

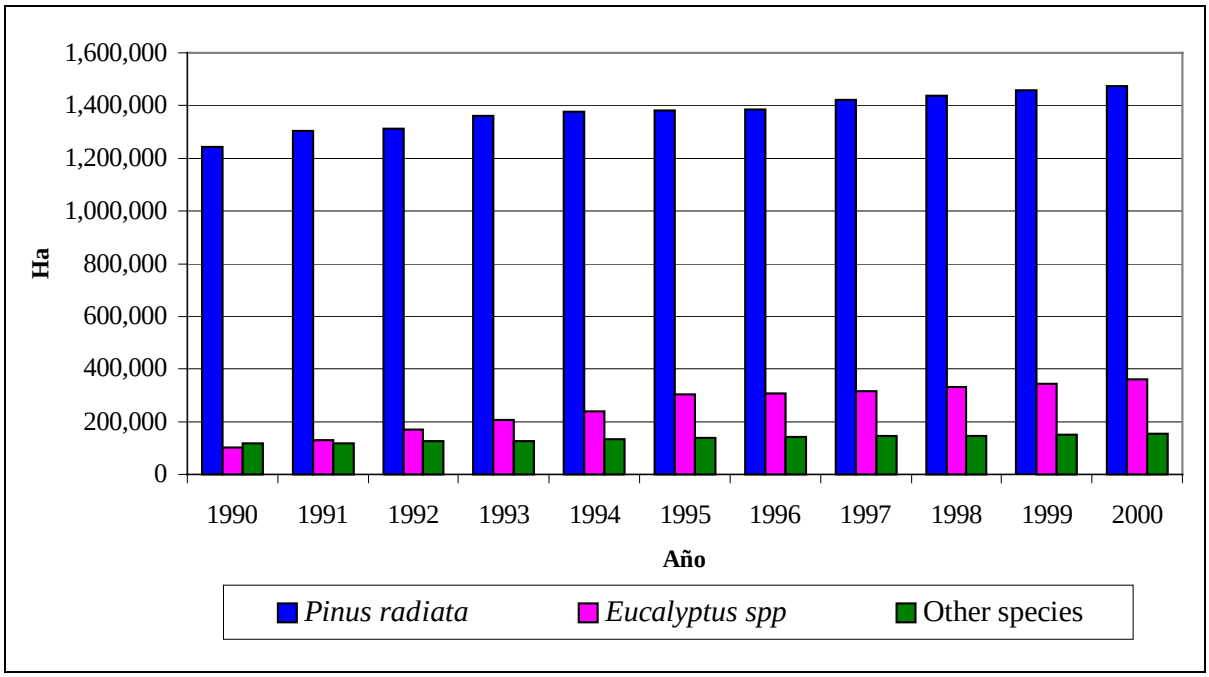
areas stretch between Regions V and XII, with pine plantations concentrated in Regions VII-X. Native forests include a great variety of species and grow about 12 to 15 million cubic meters of timber per year. About 15 percent of native forests have an industrial use; the rest is used for fuel-wood, see Figure 11.9.

Figure 11.7: Industrial Consume of Logs 1990-2000 (thousand m^3 solid without bark)



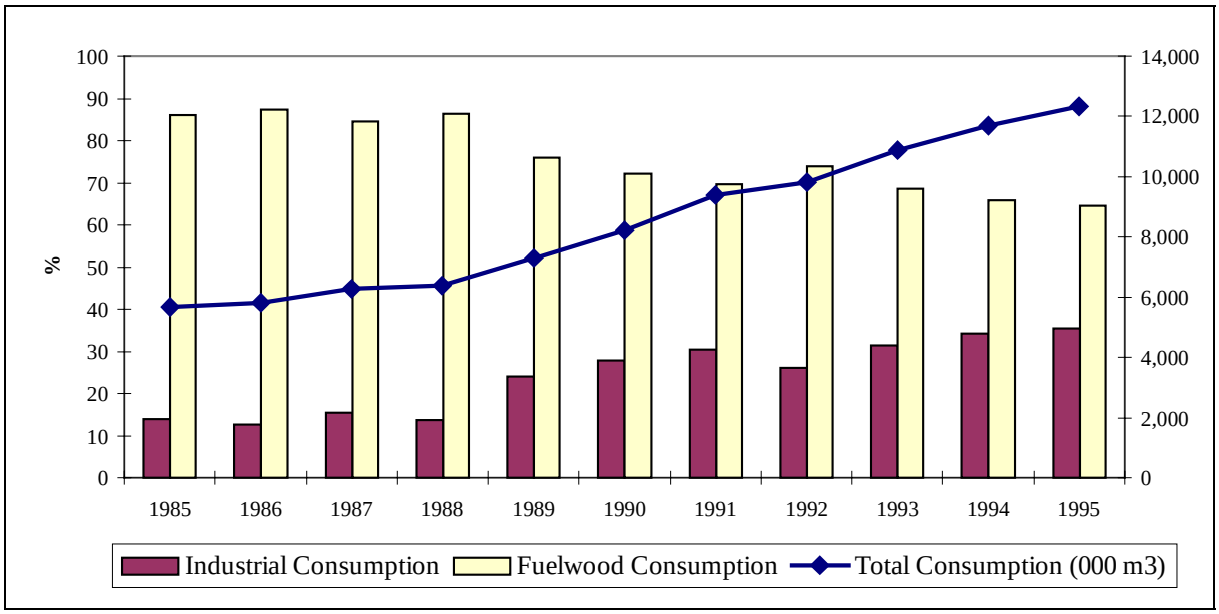
Source: INFOR *Estadísticas Forestales* Several Issues

Figure 11.8: Plantations Surface Area by Species



Source: INFOR *Estadísticas Forestales* Several Issues

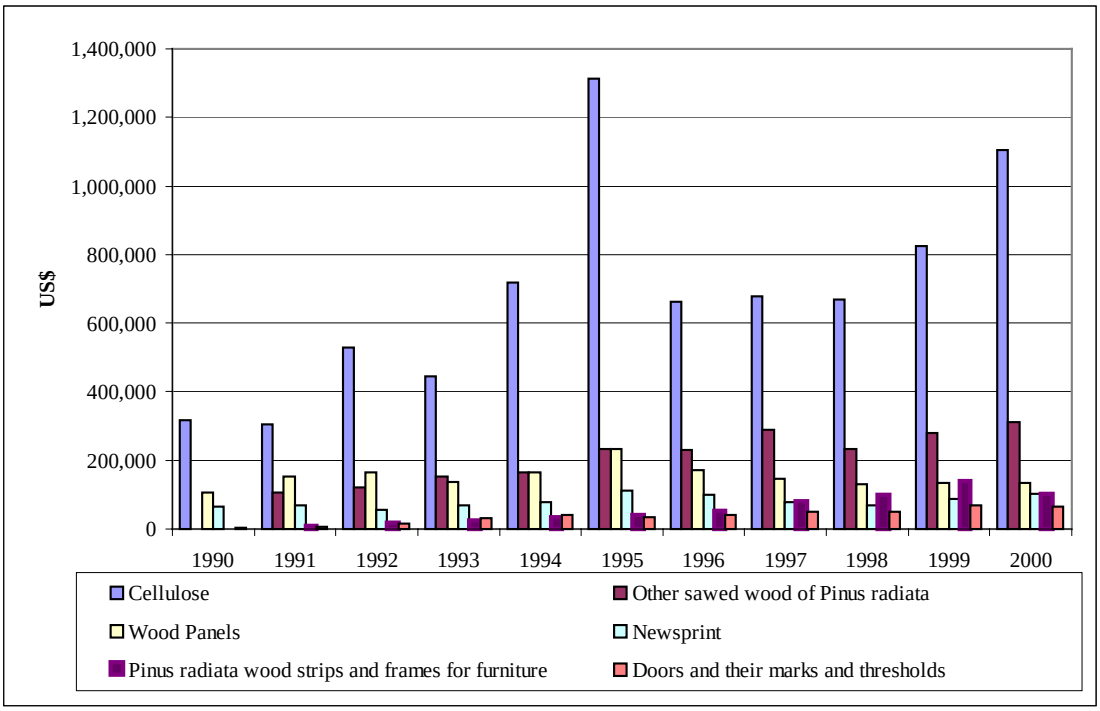
Figure 11.9: Consumption of Native Forest



Source: INFOR *Estadísticas Forestales* Several Issues

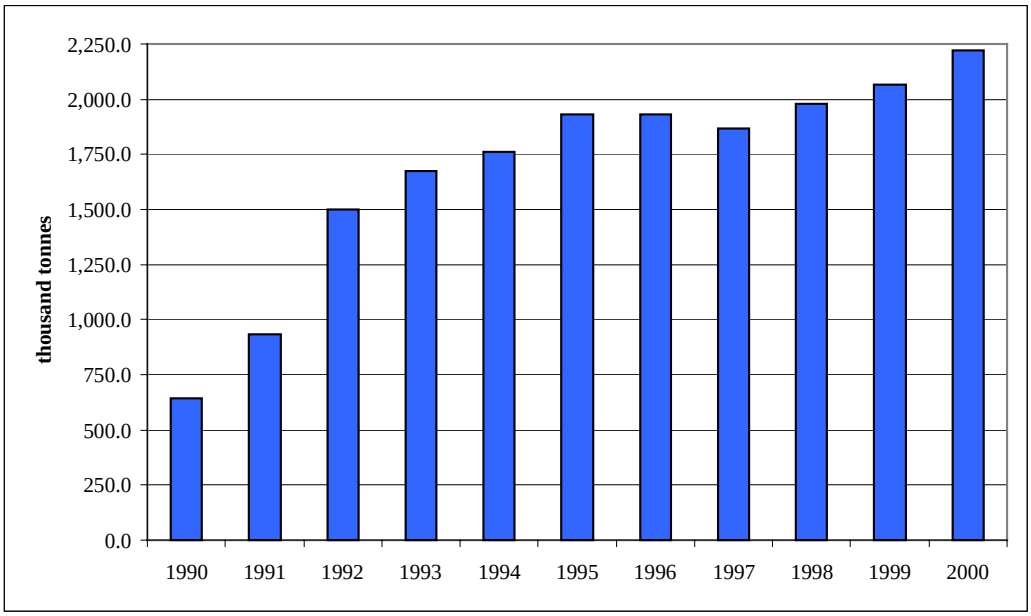
Wood Processing. Among the wood processing businesses, the pulp and paper industry has the largest share of foreign exchange generation, as shown in Figure 11.10. Between 1985 and 2000, pulp and paper production and exports triplicate and production reached almost 2.6 million tons of pulp. The early 1990s saw tremendous expansion in the pulp industry, with investments between 1991-94 exceeding US $1.8 billion. Chemical pulp production rose from 644 000 tons in 1990 to just over 2.2 million tons in 2000 – see Figure 11.11. The pulp and paper industry is highly concentrated: half of the plantations in Chile are owned by wood processing companies. Seven privately owned companies control all production capacity for pulp and 70 percent of production capacity for paper and carton. Four companies account for all exports. There are seven chemical pulp plants, four mechanical pulp plants and six recycling pulp plants in Chile. Most pulp produced is exported. Of the 2.6 million tons of pulp produced in 2000, 1.9 million tons were exported. Pulp exports earned US $1,106 million in foreign exchange. Japan and Europe are the principal importers of Chilean pulp.

Figure 11.10: Chile: Main Forestry Products Exported (1990-2000)



Source: ODEPA (2001)

Figure 11.11: Development of Chemical Pulp Production in Chile, 1990-2000 (thousand tons)



Source: INFOR *Estadísticas Forestales* Several Issues

- **Environmental and Social Issues of Concern**[36]

  Environmental concerns can be divided into those related to the sustainable management of native forest and those associated with processing wood, mainly pulp production. The transport of wood and processed products has minor environmental impacts.

  - *Plantations.* Pulp and paper industry only uses plantation woods as a source of raw material. There is no direct exploitation of native forest. Plantations have the potential to affect (positively and negatively) soil conditions, groundwater systems and natural habitats.

  - *Biodiversity and Natural Habitats*. During the last decade, there has been a debate in Chile about whether tree plantations have replaced native forests. In the period from 1962 to 1990, it is estimated that plantations replaced about 5-10 percent of native forests. Plantations also can reduce biodiversity in the ecosystem when substitution occurs, since both the chemicals used to control pests on plantations can be harmful to other species and native forests presents most abundance of biodiversity.
  - In general higher demands for forestry products will always increase the pressure on all kinds of species. However, the current use of native forest is mainly for fuel wood. Additionally, it must be considered that more than 18 millions hectares without productive use in Chile are considered as "Forest Aptitude Terrains", and their use could lower the pressure on native forests.

  - *Soil Erosion.* As above-mentioned, the impact of new plantations on soil erosion depends on the change in land use as well as on local variables (climatic, topographical, etc.). In general, plantations established on former barren lands reduce soil erosion, mainly because rainfall and wind does not directly strike the soil. When plantations replace other crops or vegetation, the impact on soils depends on the characteristics of the crop or vegetation, but in general positive impacts are likely. One study on soil loss under forestry versus agriculture indicates a clear advantage for forestry - see Table 11.4. Correct soil management practices can significantly reduce the potential of erosion from plantations. In Chile, the most important private companies are currently introducing such practices.

Table 11.4: Soil Erosion from Agriculture versus Forestry

Alternative (after respective harvesting)	Soil loss (ton/ha/year) Agriculture	Soil loss (ton/ha/year) Forestry
soil type: red clay residues of activity were burnt, soil without cover	25.3	3.12
soil type: Trumao residues of activity remained on soil	12.3	0.53
soil type: red clay residues of activity remained on soil	5.8	0.84
soil type: Trumao residues of activity were burnt, soil without cover	22.4	2.76

Source: Carrasco *et al*, 1993

[36] This section is based heavily on CIPMA (2000).

- *Carbon Capturing.* Forest and plantations can slow down climate change by capturing carbon dioxide (CO_2) and thus reducing concentrations in the atmosphere. One hectare of *Pinus radiata* captures approximately 8 tons of CO_2 per year. Given a rotation period of 25 years, 200 tons of CO_2 per hectare are captured in one rotation period. There are about 2 million hectares of tree plantations in Chile. In total, they capture about 400 million tons of CO_2 in one rotation cycle. (INFOR, 1998[37]).

Pulp Production

Pulp is produced either mechanically using a grinding process or chemically. Chemical pulps are classified as soda, bleached and unbleached sulphite, and bleached and unbleached sulphate (Kraft). The Chilean pulp industry mainly produces long fibre, chemically bleached Kraft pulp made from *Pinus radiata.* One factory produces bleached short-fibre pulp from hard wood (*Eucalyptus spp*.).

Environmental effects from manufacturing pulp and paper include water pollution through liquid effluents such as chemicals and wood residues, odours from the use of certain chemical substances and, in less quantity, air pollution from combustion of fuel for drying purposes.

Discharges into waterways include solids composed of dirt, grit, fibre and additives. Environmental problems related to these sediments include increased water turbidity, interference with aquatic plants and animals and clogging of streambeds. The organic content stimulates algal growth and exhausts dissolved oxygen.

Air pollutants include marcaptanes and sulphurous compounds emitted during the pulping process and particulate matter from combustion processes. One study indicates that the pulp and paper industry annually emits 5 242 tons of particles, 6 827 tons of sulphates, 41 303 tons of SO_2, 12 812 tons of carbon monoxide, and 4 340 tons of H_2S, (Steiner 1991[38]).

Odours from pulp and paper factories are major sources of contamination in some communities. Although in the past no data have been collected, residents near the factories register repeatedly complaints to their municipal governments or local public health officials.

Environmental impacts vary greatly between factories. In general, export-oriented enterprises in an industry are more efficient and have adopted newer, more environmentally-friendly production technologies than those enterprises that supply the domestic market (CONOMA, 1996[39]). International market competition provides incentives to firms to decrease production costs by investing in the latest environmental technologies, such as closed cycles for emissions and effluents and self-sufficient energy generation systems. In the pulp and paper sector, firms with plants less than 10 years old use lower-impact environmental technologies (through the use of wood bark and wood cuttings) and effluent treatment plants. In contrast, older manufacturers lacked emission controls for water and air emissions until recently. In the past few years, these companies have invested in various types of environmental technologies.

[37] INFOR (1998) "Trayectoria del Sector Forestal Chileno", Informe Técnico No. 140, Sanitago, Chile.

[38] STEINER, R (1991) Principales Emisiones de Contaminantes Atmosféricos y Algunos Medios para su control. CEPAL, LC/R 983.

[39] CONAMA (1996) "Environmental Management in Chile", Santiago, Chile

Forestry Policies and Institutions

Chilean regulations affecting the forestry sector focus both on promoting economic forest development and conserving native forests in a National System of State Protected Wild Areas (SNASPE). The economic success of this industry is closely linked to the extension of industrial plantations. From 1974 onwards, Chilean government has promoted forest plantations through a direct subsidy to producers. Air and water emission standards apply to the forest industry as they do to all Chilean industries.

There is a wide range of forestry legislation concerning the protection and sustainable management of forest resources. The 1931 'Law of Forests' led to the creation of protected areas. A new Law on Native Forests is currently under discussion since 1995 in Congress. In this context, the development of the forestry sector has been distorted by a government policy that gave preference in awarding subsidies to large plantation landowners. In 1997, amendments to Decree 701 were intended to correct this bias. In addition to environmental protection measures, the amendments provide subsidies for the maintenance of plantations and to small-scale plantation owners. These incentives include creating plantation developments on fragile lands and areas under desertification. There are also incentives for less environmentally damaging logging practices but these produced a reduction in the plantation rate of large plantation landowners.

Air and Water Standards

A norm sets water standards for biological oxygen demand (BOD_5) and total suspended solids (TSS) for all industries in the country. Limits of 300mg/litre for BOD_5 and 300mg/l for TSS have been set. The use of economic instruments to reduce water emissions is at a more preliminary stage of discussion.

There are no specific standards on air emissions applying to the forestry sector. Supreme Decree 185 (1992) sets standards for various pollutants (SO_2, NO_2, particles, CO, ozone) that are comparable to emissions standards set by the United States Environmental Protection Agency.

A decontamination plan is needed if the norms are not met. To date, decontamination plans have involved only the mining industry. The introduction of the new water effluent norms will present a challenge for all other industrial sectors, mainly the pulp and paper sector

Chilean producers that export paper-related products to the EU for final use there will have to conform to EU process norms.

Odours

Due its relevance, the pulp and paper industry is the first industry in Chile to be regulated for the odours it produces. There is no data to quantify systematic emission. With the new odour norm pending, companies have started to measure emissions. The emission norm sets limits for total reduced sulphur (TRS) for lime kilns, recovery boilers, smelt dissolving tanks, power boilers and incinerators. The limits are comparable to those in other countries with significant pulp and paper production. The norm is being introduced gradually. Most other countries do not have norms for power boilers and incinerators, so in that respect the Chilean requirements are even more stringent than in other countries.

- **Economic Sustainability**

  As discussed above, in the last 20 years, Chile's forestry sector trade has grown spectacularly. A wide variety of products is being exported to diverse markets all over the world. Additionally, plantations have allowed the recovery of previously eroded areas. Chile is becoming an important player in some products: it still has a great forestry potential and can produce at very competitive costs. The institutional arrangement, though far from perfect is fairly effective and the legal framework required to protect forestry related values is currently under intense discussion.

  Exports have been the engine of Chilean forestry development. The importance of trade for this sector is illustrated by the fact that, in recent years, over two thirds of national primary forestry output has either been exported directly or else has been used in the production of other export goods.

  The results from the GTAP simulations show that the forestry sub-sector is expected to grow by 0.52% and the rest of the sector (wood, pulp and paper) by 0.79% as a result of the EU-Chile agreement. In contrast, the growth pattern of forestry sector for the past decade was 1.81% annual growth between 1990 and 2000. The limited impact of the EU-Chile trade agreement on the sector is because most sector production, with the exceptions of particle board (HS 4410), fibreboard (HS 4411), plywood (HS 4412) and articles of natural cork (HS 4503), previously entered the EU tariff free.

  In effect, the GTAP projections suggest that forest products are diverted from other uses to wood, pulp and paper. Since Chile's own data groups these two sectors together, this possibility is difficult to test. Since the traded good, wood, pulp and paper is likely to be better modelled than the non-traded forest products, it is likely to be better forecast by GTAP and it is this projection that we will follow.

  Any additional demand for the products of this sector is, however, expected to be limited as most products already entered the EU duty free.

- **Social and Environmental Sustainability**

  The social and environmental impacts of the agreement will depend on the change in land use as well as on local variables. Thus if the forestry sector can grow using plantations, the environmental and social impacts will be minimal, perhaps positive if some soil erosion can be prevented. That will not be the case if the consumption of native forest continues to grow, since loss of biodiversity and natural habitats could not be avoided.

  Any potential increase in forestry output that does occur could create pressure for the incorporation of native forest into pulp production. This was the case of the so-called Trillium Project in XII Region, which offered a "sustainable native forest management" for the millenaries lenga (*Nothofagus pumilio*) forest. However, an important environmental movement strongly opposed the project. As the Chilean national environmental law requires an Environmental Impact Assessment (EIA) for all major projects, project start was delayed. Finally, the environmental authority, CONAMA, rejected the project.

  The EU-Chile trade agreement is expected to produce some additional demand for wood, pulp and paper products, which suggests that there will be increased demand for forest products (although this is not projected by

GTAP). If this demand does occur, it is likely to be generally fulfilled from plantations, although pressure on native forests cannot be fully ruled out.

The environmental effects from transforming wood into pulp are expected to increase somewhat as a consequence of the EU-Chile trade agreement, exacerbating problems of water pollution through liquid effluents such as chemicals and fibres; odours from the use of certain chemical substances; and air pollution from combustion of fuel for drying purposes. These environmental impacts will ultimately depend on the enforcement capabilities of the Chilean environmental agency and certainly on the political will of avoiding these impacts. If the current norms are respected, investment in new and cleaner technology may keep pollution to acceptable levels.

As in the case of Trillium, the EIA framework should ensure that negative impacts on native forest will be dealt with. The general environmental law assures that all parties will participate in the EIA. In practice, any major effect is dealt with under the EIA.

Soil erosion from plantation harvesting is also a problem but a less serious one.

- **Sustainability impacts and Mitigation Measures**

Table 11.5: Summary of sustainability impacts for the forestry sector

	Dimensions / Significance Criteria				
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C	Revers-ibility D	Capacity to change E
I Economic					
1. Real income	△		?		
2. Net fixed capital formation	△				
3. Employment	△				
4. Consumer effects	▽				
II Social					
5. Poverty	○		?		
6. Health and education	○				
III Environmental					
7. Environmental quality	▽	▽			△
8. Biological diversity	?				
9. Other natural resource stocks	?	▽		▽	△

For explanation of symbols, rows and columns, see Section 5 or Section 19.

The impact of the EU trade agreement is limited in this sector, as the agreement is expected too result in limited additional growth. Sustainability issues are not qualitatively different from the existing situation.

A demand increase could lead to expanded demand for forest products. While most of this would be supplied from existing plantations or new plantations that are not based on natural forests, pressure on these could nevertheless be expected to grow. A sustainability impact that covers consequent damage to

environmental indicators and to the interests of those who depend on the forest cannot be ruled out but the evidence for this is very limited.

The environmental impacts of more pulp-based product production are a likely consequence of the increase in demand for these goods.

The sustainability impacts are similar to existing effects. Mitigating measures therefore need address existing issues.

Greater understanding of the possible environmental effects from pulp production and plantation harvesting is required within the Chilean decision-making process. Mitigating measures should concentrate on generating more information on environmental damage and on the impact of existing policy measures so as to refine policy reform priorities and design better policy instruments.

Possible market-based policy instruments that could be examined could include water effluent fees as an approach to enforce water emission standards.

The case for native forests being placed under pressure has not been fully made but nor has it been rejected. This could warrant further study.

12. Sector study: Processed Foods, Chemicals, Non-Ferrous Metals and Mining[40]

12.1 Processed Food

- **General Overview**

The Processed Food sector accounted for 8.4% of manufacturing industry in Chile in 2000, a share of 1.4% of GDP, for a total value added of US$ 1.05 billion. It is a fast growing sector: the production index for April 2002 indicates an increase of approximately 17% over April 2001.

Processed foods is a very important export sector. The share of processed foods in total exports for 2000 was almost 9.4%. Sector exports by major destinations in 1996 are distributed as follows: EU 22.4%, Japan 18% and U.S.A. 11%. “Canning and Processing of fish” and “Canning and Processing of fruits” are the most dynamic sub sectors in the industry of Processed Food and their production are focused mainly on foreign markets. For 1996, 40% of the supply of these sectors was exported, a trend that has been maintained in recent years, supported by new investment and the introduction of new technologies.

- **Social Issues of Concern**

The Processed Food sector is basically capital intensive. In 1996 the share of capital over value added (K/VA) was 52%. This relationship has grown 11% since 1986, indicating an increasing trend to automation of the sector. In relative terms, employment by the industry of food processing represents 21% of total employment in the Food sector and 5% of the employment of all the Manufacturing Industry. 84% of labour consists of skilled workers using the INE-Chile definition, a relationship that has been maintained in recent years. This is shown in Table 12.1.

[40] References for this Section and Section 14 (Sector study: Land Transport, Electricity and Tourism):

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Table 12.1: Sector Definitions of Skilled and Unskilled Labour

		Processed Food	Chemicals	Non-Ferrous Metals	Mining
Skilled Workers	Armed Forces	0%	0%	0%	0%
	Executive Power	20%	13%	4%	14%
	Professionals and Scientists	6%	16%	10%	18%
	Technicians and medium level professionals	6%	14%	7%	10%
	Office employees	10%	12%	6%	7%
	Salesmen	8%	5%	8%	1%
	Agriculture and skilled worker	2%	0%	0%	8%
	Officials, Operatives and Artisans	18%	6%	31%	18%
	Operatives and fitters	15%	25%	28%	17%
Unskilled Workers	Unskilled workers	15%	7%	4%	6%
	Not specified	1%	0%	2%	0%
	Total	100%	100%	100%	100%

Approximately 33% of those employed in the Processed Food sector are female. In terms of salary, the average wage of women is approximately 90% of the average salary of the male worker, a monthly average of US$ 430.

- **Environmental Issues of Concern**

The Processed Food sector has a high orientation toward external markets. This demands compliance with a number of sanitary norms and environmental obligations agreed with trading partners, including the neutralization or cleansing of industrial waste.

Studies by CEPAL show that after the Chile's opening of the economy undertaken in the mid eighties, the Food sub-sector (311, ISIC) that most increased their pollution discharges were those linked to export sectors that had considerable growth. The study shows that there is a positive "scale effect" in the Food Industry and that this effect explains most of the increase of pollution in this industry.

Each sub sector generates different levels of pollution according to the characteristics of the productive processes. For example the sub sector "Grains" generates, on average, 47 (ton/year) of PM-10 (Particulate Matter smaller than 10μg). For the remaining sectors, the elimination and processing of industrial fluids is the main environmental problem.

- **Economic sustainability**

The GTAP estimations made for the Processed Foods sector show the EU-Chile Trade Agreement has a positive effect on total production. This is consistent with the positive impact of the agreement on sector exports. It is also consistent with the fact that the 'Processed Food' sector has shown a great dynamism after the opening of the economy and regional integration measures such as commercial agreements with Mexico and Canada.

Due to the importance of the EU in the exports of the processed food sector (22%), the reductions of the existing tariffs and the potential improvement in market access given by the sanitary and phyto-sanitary agreement should have an important positive impact on the exports of the sector. GTAP estimations show an expected increase of 12.35% in physical terms. Additionally, although the imports of the sector are mainly from countries not

in the EU, which represented in 1996 barely a 6% of total imports by the sector, the model suggests that the commercial agreement would have slight positive effects on these, a 4.15% increase in physical terms.

- **Social sustainability**

  The increase in the competitiveness of this sector in the European market will increase the level of production by an estimated 3.35%. According to GTAP this would increase local prices for these products by 0.32%. This is considered to be due to the increase of production costs mainly related to higher value products and higher wage levels.

  These results are consistent with the information available for the sector. Studies made by the ILO that measure the impact on employment in Chile due to the post reform commercial opening (1986-1992) show that for the Food sector the employment generated by the increase of exports was greater than the employment displaced by the increase of imports. The employment in this sector is mainly of skilled workers on the INE-Chile definition, 84%, in 1998. As a result, the strong impulse to exports from the agreement will lead to increased production and hiring of relatively high cost workers with greater qualifications.

- **Environmental sustainability**

  The increase in sector production has a positive “scale effect” in the processed food sector, i.e. the increase in production of the sector explains the increase in pollution. Nevertheless, there are also possible positive technological effects that can appear in the industry. The environmental standards in Chile together with the greater flows of investment to the sector will most probably result in greater investments in less polluting processes and more treatment of liquid waste, the main problem of this industry.

  The improvement in the phyto-sanitary conditions resulting from the agreements, actually only require improved administrative processes. There will not be any negative impact on current and new production processes since all will tend to comply with the standards since it is in the interest of the sector that each plant to perform well from an environmental perspective.

12.2 Chemicals

- **General Overview**

  The Chemical Industry represented 3% of GDP in 2000, approximately US$ 1.88 billion. This represents an annual increase of 6% with respect to the 1999. In April 2002 sector production had grown by 11% with respect to the previous year, indicating a trend to the increase of local production. The Chilean chemicals industry is, as elsewhere, highly cyclical and internationally integrated.

  The characteristics of the sector show a high participation of imports, both for final and intermediate consumption: 37% of total supply of chemical products is imported. 17% of intermediate consumption of this sector is delivered by the domestic chemical sector, indicating that there is national value added in this sector. Considering the origin of imports, 29% of Chemical products come from the EU, followed by the U.S.A. with 27%. In the year 2000, chemical imports reached US$ 2.9 billion, representing almost 13% of total imports of the country.

Exports of chemical products have been growing: between 1995 and 2001, the FOB exports of the Chemicals sector have increased by 42%. As a result, in 1997 they represented 3.9% of total country exports while in the year 2000 their share expanded to 4.3%. However, in 1998 and 1999 the value of the exports of the chemical industry underwent fluctuations due to the deterioration in international prices. This situation changed in the 2000, as total exports increased 20% in value.

- **Social Issues of Concern**

An important feature of this sector is the trend toward increased importance in the share of labour in sector value added (VA). In 1996, labour represented nearly 40% of VA, a growth of 1.5% with regard to 1986. For this same period the share of capital in value added fell by 3.6%. Employment in the sector is mainly of skilled workers, who account for 92% of the total, according to the INE-Chile definition. This share has increased considerably in the sub sector "Non-metallic mineral industry". Variations in the proportion of value added accounted for by labour can be accounted for by the cyclical nature of investment.

In 1998, female employment in the sector accounted for only 25%. However the sector presents the characteristic of a greater average salary for women than men: in 1998 it was 8% higher reaching around US$ 1500 per month. This is likely to be due to women being excluded from some lower-paying jobs in the sector.

- **Environmental Issues of Concern**

In 1986 the Chemical Industry in Canada developed the "Responsible Care" program to ensure adequate environmental stewardship by the chemical industry. Since then, it has been adopted for the world chemical industry and is administered by the Associations of Industrial Chemists of each country. From 1991 the International Council of Chemical Associations (ICCA), through its Responsible Care Leadership Group, ensures the integrity in the world development of the program and serves as a focal point for its world promotion. In Chile, in 1993 the first Environmental Code of Conduct for the Chemical industry was developed. In 1994, the national version of Responsible Care under the name of "Conducta Responsable" was initiated. It has been very actively pursued.

As of September 1998, a "Clean Production Agreement" was signed by the sector. It requires firms in the industry to include clean technologies for the minimization of industrial waste water (Riles[41]). The same year emission standards for Riles to water courses were established. Subsequently an agreement was signed that eliminates toxic substances in paintings, promotes the reusability and recovery of chemical agent containers, establishes systems of identification and return of containers and promotes the minimization of containers by increasing their size.

Estimations by CEPAL show the presence of a "scale effect" in the production of the sector. This scale effect explains most of the increase in contamination generated by the industry in the last years. The study concludes that the increment of pollution in this sector was related to the export boom of this industry.

[41] Reglamenta la disposicion de residuos industriales liquidos

- **Economic sustainability**

  The GTAP model projects that the elimination of tariffs in the Chemicals sector is expected to lead to an increase in total sector production of 1.5%. The major share of imported inputs and products in this sector, particularly from the EU, will result in an increase in the import of these products of 3.6%. The results of the model also consider a positive impact on physical exports that will increase by 10.8% and that 12% of total exports of the sector will go to the EU. These results are consistent with the specific sector features discussed above.

  The trade agreement will reduce input prices, fundamentally of imported chemicals. Even though labour costs may increase, imported input costs will fall, increasing the competitiveness of the sector, as is shown by the large differences between the value and quantity projections for this sector.

- **Social sustainability**

  The sector demands mainly qualified employment: 92% of the total on INE-Chile definitions in 1998. A moderate increase in relatively high value employment is expected as a result of the EU-Chile trade agreement.

- **Environmental sustainability**

  The increase of installed capacity, due to greater sector competitiveness, should increase the polluting emissions due to the positive scale effect. Nevertheless, the environmental requirements, including voluntary actions relating to Responsible Care and Voluntary Agreements, plus the requirement of Environmental Impact Assessments for all new and expansion of projects, and the water standards for the sector, would mitigate the possible negative outcomes associated to the increase in production. New sources can be expected to be cleaner, but if growth in production is very high there may be a negative net effect.

12.3 Mining and Non-Ferrours Metals

- **General Overview**

  Chilean statistics do not allow separation of the production of many non-ferrous minerals from copper production. Other non-ferrous metals are considered separately. Mining considers the following ISIC sectors: 210, 220, 230, 290 and 3720. Non – Ferrous Metals include ISIC 381 and 382.

  Chile is a major actor in international mining. It possesses one of the largest mining zones of the world. Mining is the most important economic activity in Chile accounting for 37% of total exports in the year 2000, with copper, its main product, reaching 30% of shipments. Mining also concentrates the greatest share of foreign investment in the last decade, accumulating 42% of total investments. Finally this sector accounts for 7.4% of GDP in 2000.

  Chile has more than 25% of the world reserves of copper. It is leader in the production of sodium nitrate and potassium nitrate. It has the largest reserves of selenium and rhenium. Furthermore it is the second world producer of lithium, molybdenum and iodine.

Table 12.2: Mineral Exports (million dollar FOB)

Products	1998	1999	2000
Copper	5 083.3	5 896.6	7 457.3
Gold	273.8	304.0	337.1
Silver	143.2	123.8	94.2
Metallic and Ferrous	409.1	309.2	365.8
Industrial or Non Metallic	410	398.0	404.0
Total Exports Mining Sector	**6 319.4**	**7 031.6**	**8 658.4**

The exports of the mining sector have increased during the 1998-2000 period. During 1999 exports reached US$7.03 billion with an 11.27% increase with respect to 1998. In 2000, exports reached 8.66 billion dollars, an increase of 23.14% with respect to the previous year.

The EU represents the main destination of mineral exports with 29.3% of the total. It is followed by Japan with 23.6% and the U.S.A. with 11.2%. However, between 1995 and 2001 total exports of the sector to the EU fell in 24%. In the year 2000 Mining represented 11% of total imports, an increase of 26% with respect to 1999 and 100% with respect to 1998. These imports correspond basically to Petroleum (80%) and it basically originates in Latin America. However imports of oil normally are obtained from the cheapest source available, so they vary each year.

The Non-Ferrous Metals Industry (excluding copper) sub-sector represented 1.3% of GDP during year 2000, a total of US$1.0 billion. Of total supply of the sector, 72% is local production. The sector has been accumulating stocks: production in the last year increased by 1.7% while physical sales fell by 8%.

The characteristics of the sector show that it is an important supplier of inputs to the Chilean industry: intermediate consumption represents nearly 71% of total demand. The Construction Sector is the main demanding sector with close to 50% of total intermediate sales of the sector. In the last four years the construction sector has been depressed, influencing negatively the production of non-ferrous metals.

Chile is a net importer of non-ferrous metals (excluding copper). Exports by this sector represent 1.5% of total exports, reaching approximately US$ 240 million in 2000. The EU, with 37.5% of total exports, represents the most important destination of sub-sector exports. Between 1995 and 2000, exports to the EU increased by 54%. Imports on the other hand, represented 3.5% of total imports by the country in 2000. This in monetary terms represented approximately US$ 800 million. The main market of origin was the EU with 26% of imports, followed by the U.S.A. with 24%.

- **Social Issues of Concern**

The mining sector is a capital-intensive industry. 93% of sector employment consists qualified labour on the INE-Chile definition. The monthly average salary in the year 2000 was US$ 850. On average, mining pays more than US$ 850 million in salaries annually and generates 70 000 jobs. In terms of composition of employment, 95.6% consists of male labour. The scarce female participation results in major industry salary differentials, the average salary of women being 40% lower than men's.

The share of employment as part of the value added of the non-ferrous metals (excluding copper) sub-sector represents 34% in 1996. This fell with regard to 1986, which indicates a greater level of automation of the industrial productive processes. In this sub-sector, 94% of labour consists of qualified labour. The monthly salary average in 1998 reached US$ 900. In terms of gender composition of employment, 95.3% consists of male labour. The scarce female participation parallels substantial industry salary differences: the average salary of women is 43% lower than men's.

- **Environmental Issues of Concern**

Large mining companies of the country, including copper, gold, silver, iron, manganese and non-metallic mining, have implemented environmental management systems during the last decade reflecting an increasing concern about environmental issues. The State has also required stricter standards for air pollution, water pollution and is now discussing the issue of better mine closure and abandonment procedures. The environmental investments undertaken in the sector reflect current priorities: 50% in reduction of atmospheric emissions, 28% in treatment of water waste, 18% in treatment of solid wastes and 4% in noise reduction.

The permanent scarcity of water in the north of Chile —one of the driest deserts in the world— and its inadequate management has been a growing cause for concern. The doubling of copper output during the 1990s significantly increased the demand for water. Some experiences have been documented in which small rural communities have been left without water supply due to the installation of mining works in their immediate surroundings. Moreover, mining companies have done significant prospecting work and have identified and are exploiting subterranean water sources**,** some of which are fossil sources. The impact of the shrinking of these reserves on the fragile ecosystems in the north is unknown.

Small-scale mining companies have several environmental problems. This sector has not been concerned about environmental management and has had very limited investment capacity to improve procedures. Small-scale mining impacts the physical environment through removal of material and changes in the landscape, emissions of particulate material and discharges of liquid effluents into streams and rivers in an uncontrolled way.

Environmental Impact Assessments are routine in this sector for large mines. The mining sector has been leader in the presentation of projects to the SEIA (System of Environmental Impact Assessment), even before this was obligatory by Law. Total investments submitted amounted to US$ 11.24 billions already in November 1998. This represents 39% of the total of investments submitted to the system.

The main environmental concerns in the non-ferrous metals (excluding copper) sub-sector have to do with the fulfilment of the effective norms in atmospheric emissions and management of solid wastes. Specific standards have been set for some processes within this sector. Within two years, the smelters are required to reduce emissions by 75% in their smelting process and their diffuse emissions in sand plants by 100%.
Cleaner fuels like natural gas, liquefied gas and diesel are being introduced, as well as the conversion of the induction ovens to electromagnetic ovens.

In solid wastes, measures are geared to minimizing, recovering and reusing wastes generated in the industrial process. A market in industrial waste is being developed, so that the wastes of one company can be traded and used by another as an input.

Environmental investments in the sector are distributed as follows: 52% atmospheric reduction of emissions, 20% processing of riles, 13% treatment of solid wastes and 15% reduction of noise.

- **Economic and social sustainability**

The GTAP simulations work on a different aggregation system to the one used in this chapter. In GTAP, mining is treated separately from all mineral processing.

The GTAP simulation is based on a reduction of 100% in the existing tariffs. The GTAP projections for mining (excluding all processing) indicate a slight increase in production of 0.36%, together with a reduction of mining exports of 0.4% in physical terms. This is because relatively more processing is being performed within Chile.

The GTAP results in the non-ferrous metals (including both refining and smelting activities) sector indicate an increment in the production of the sector of 2%. The production of these products is actually strongly related to copper production and only weakly to variations in their prices. Considering that the EU represented in 1998, 37.5% of total exports of the sector, a reduction in tariffs should increase trade and production. The minor impact is presumably because EU tariffs were fairly low prior to the trade agreement.

This contrasts with the behaviour of exports to Canada, which after the signing of the trade agreement, increased by 267%. However, this could be explained by the behaviour of the mining industry in Canada, which, due to higher production costs and the decrease in international prices, has closed several mining projects. The increasing trend of mining activity is expected to continue.

Finally, the results on employment are uncertain. Due the technological characteristics of the sector, the use of labour has a tendency to decline. However average sector salaries could increase as the decrease in employment will mostly be of less skilled workers.

The model also predicts an increase in processing employment, both qualified and non-qualified. This is in agreement with studies by CEPAL that indicate that at the beginning of the nineties, the exporting effect of increased exports on employment was positive in this sector. Two points are noted: first, the share of employment inside this sector has diminished, indicating a growing process of automation, so employment should not increase substantially. Second, between 1986 and 1996, the share of qualified employment has increased in the sector, so that a greater relative increase in this type of jobs is expected.

- **Environmental Sustainability**

The expected increase in production should increase emissions. As discussed previously, CEPAL determined that the scale effect basically explains the increase of pollution in this sector, in the early nineties. However, national environmental regulations should dampen the scale effect of new investment projects. Furthermore, a technological effect due to cleaner new technologies could also dampen the scale effect. The final result on emissions however is uncertain. Nevertheless, at a local level environmental problems are likely to persist specially regarding small and medium sized mines. Negative effects on water availability, and on underground water quality and quantity, are also

expected. Lack of strict closure and abandonment procedures may result in increased waste problems and negative impacts on water quality.

The increment of local production of non-ferrous metals (excluding copper), stimulated by the increase in exports, may also generate negative environmental effects. As discussed above, CEPAL determined that for the period post economic reform –a period of great exporting boom- the scale effect would explain in its totality the increase of pollution associated to this sector.

No major change is expected to affect the copper sector due to ownership. Incentives to attract investment for this sector have existed for many years. Most investment has come from Canada, U.S.A., South Africa and to a lesser extent, the UK. However, in the case of non-ferrous metals (excluding copper), some changes may arise. European investors are important in this sector (e.g. Spanish capitals in marble and Swiss capitals in cement). Therefore, the agreement should stimulate a greater amount of technology transfer in this sector and therefore reduce the environmental impacts.

There should be no environmental effects of the agreement on small and medium scale mining. According to sector experts, small scale mines are in trend to disappear and the medium scale mines are already confronting higher environmental standards requirements. Thus, the effect on both of these should be quite neutral. However, if a specific policy towards this sector is undertaken some technological transfers could be received by them (medium scale mining), and even generate an overall positive environmental effect.

Regulations regarding closure and abandonment of mines are required to avoid major long run impacts on sustainability. However this issue is currently being addressed by the authorities.

12.4 Sustainability Impacts

Table 12.3: Summary of sustainability impacts in Processed Food Sector

	Dimensions / Significance Criteria				
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C	Revers-ibility D	Capacity to change E
I Economic					
1. Real income	△				
2. Net fixed capital formation	△				
3. Employment	△				
4. Consumer effects	?				
II Social					
5. Poverty	○				
6. Health and education	○				
III Environmental					
7. Environmental quality	↕	▽			△
8. Biological diversity	○				
9. Other natural resource stocks	○				

For explanation of symbols, rows and columns, see Section 5 or Section 19.

Table 12.4: Summary of sustainability impacts in Chemicals Sector

	Dimensions / Significance Criteria				
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C	Revers-ibility D	Capacity to change E
I Economic					
1. Real income	△				
2. Net fixed capital formation	△				
3. Employment	△				
4. Consumer effects	△				
II Social					
5. Poverty	○				
6. Health and education	○				
III Environmental					
7. Environmental quality	↕	▽			**△**
8. Biological diversity	○				
9. Other natural resource stocks	○				

For explanation of symbols, rows and columns, see Section 5 or Section 19.

Table 12.5: Summary of sustainability impacts in Non-Ferrous Metals and Mining

	Dimensions / Significance Criteria				
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C	Revers-ibility D	Capacity to change E
I Economic					
1. Real income	△				
2. Net fixed capital formation	△				
3. Employment	△				
4. Consumer effects	△				
II Social					
5. Poverty	?				
6. Health and education	▽				
III Environmental					
7. Environmental quality	▽	▼			△
8. Biological diversity	○				
9. Other natural resource stocks	○				

For explanation of symbols, rows and columns, see Section 5 or Section 19.

Economic

The trade agreement has overall positive economic effects in the sectors analysed. In particular, Processed Food and Chemicals increase significantly their exports to the EU.

Social

In social terms, an increase is expected in the wage bill for all sectors. However, in the Mining and Non-Ferrous Metals sectors, this is achieved through a decrease in employment due to substitution by capital. The people most affected in these sectors would be non-qualified labour and women. In Chemicals and Processed Foods, on the other hand, an increase in employment is projected.

Environmental

In environmental terms, the results are generally uncertain. Previous studies show that scale effects dominated during the early nineties with the exporting boom. This accounts for a great part of the increase in pollution of these sectors. The impacts of the higher pollution are likely to be located mostly in areas surrounding each industrial activity.

Increased environmental legislation, more stringent regulations and the responsibility agreements of each industry could reduce in part the scale effect. Furthermore new investments that incorporate higher levels of competitiveness (and also cleaner technology) should have a positive technological effect, which could also reduce the impacts of the scale effect. The final outcome will depend on the characteristics of each industry.

For the Chemical sector the technological effect is more likely to overcome the scale effect due to an influx of investment, including foreign investment, in

plant in this sector. For sectors other than Chemicals, the environmental results are rather uncertain. In particular water scarcity associated with mining could get worse, although the scale effect of a free trade agreement is expected to be small.

12.5 Mitigating Measures

The measures to be taken to ensure the relatively 'clean' operation of industry can be expected to be implemented in the newer plants. Consistent application of industry best practice in environmental and sanitary / phytosanitary regulations and consistent policing is the objective. Support for implementing these measures, especially to enable smaller producers to be able to export, could be considered as appropriate flanking measures in these sectors.

In the chemicals and mining sectors, the environmental concerns and need for consistent application of industry environmental best practice is of considerable significance, especially for inhabitants whose water supplies may be affected. Co-operation to achieve consistent implementation of environmental standards is an important ameliorating measure.

Technological transfer can play a key role in this sense, as it may allow Chilean industries to access cleaner technologies at a reasonable price.

13. Sector study: Fisheries

13.1 Sector Overview

Activities connected with the fishing industry comprise the catching of fish; aquaculture: the farming of fish, notably salmon, molluscs and crustaceans; and fish processing for food and fishmeal. In the GTAP classification, fish processing forms part of the 'Processed Food' sector. Nevertheless, the whole production chain is examined in this section.

Chilean fishermen catch about 8 million metric tons of fish annually, triple the amount in 1980, using almost 13 000 ships. During the period from 1980 to 2000, the value of exports increased over four-fold, from US $339 million to US $1.7 billion and the industry's share of total exports rose from 7.3 percent to almost 10 percent. (See Figure 13.3)

Given Chile's 4 500 kilometres of coastline, the fishing industry has a great potential for the country. Indeed, Chile has enjoyed one of the largest and fastest growing fishing industries in the world during recent decades. However, since the middle 1980s, Chile's main fishing resources have experienced increasing levels of scarcity. Table 13.1 shows the situation of pelagic fisheries located in the North of the country (Regions I and II), covering the aggregate catch of the three main species of that zone (anchovies, sardine and jack mackerel) and the Centre-South Zone, Regions V to IX, covering the annual catch of jack mackerel, the dominant specie of this zone.

In the North the peak catch was achieved in 1986. Fifteen years later, the annual catch (the sum of the three main species) is just one third of that amount. The catch of sardines in the North zone now represents very small levels in comparison with the historical amounts caught in the 1980s. Even though the biomass has recovered and the annual catch of anchovies has partly compensated for the loss of sardines, the net change in the three main species over one and a half decades is negative, pointing to a clearly lower population and hence a lower annual catch.

According to Cipma (2000), for instance, three different bio-economic models have reported that the jack mackerel sector has reached exploitation levels close to the maximum sustainable yield. If the sector surpasses this level, yields will fall exponentially. This model also estimates maximum catches between 4 and 4.7 million tons annually depending on risk assumptions made keeping a minimum stock for spawning.

In the Centre-South zone, the maximum annual catch of jack mackerel was reached in 1995, after several increases in the regional fishing capacities, which began in the early 1980s. Nevertheless, towards the end of 1990s there has been a strong decline in catch levels, with catches reaching just one quarter of the peak achieved some years before.

Table 13.1: Catch and Fleet in Pelagic Fisheries

	Centre-South zone (Regions V to X)			North Zone (Regions I and II)		
	Annual Total Catch jack mackerel (000 tons.)	Number of Ships	Total Storage Capacity (000 m^3)	Annual Total Catch, *3 main species* (000 tons.)	Number of Ships	Total Storage Capacity (000 m^3)
1975	22.8	37	4.3	581.0	108	17.3
1980	274.4	47	6.3	1982.9	133	25.3
1985	870	81	22.5	3160.8	211	52.1
1990	1983	136	58.6	1639.4	213	58.7
1995	4089	173	107.4	1891.9	163	49.9
1999	1267	153	122.8	1147.1	132	46.3
2000	1065					

Source: Subsecretaría de Pesca, *Informe Sectorial Pesquero*, Several Issues and SERNAPESCA, *Anuario Estadístico de Pesca*, Several Issues

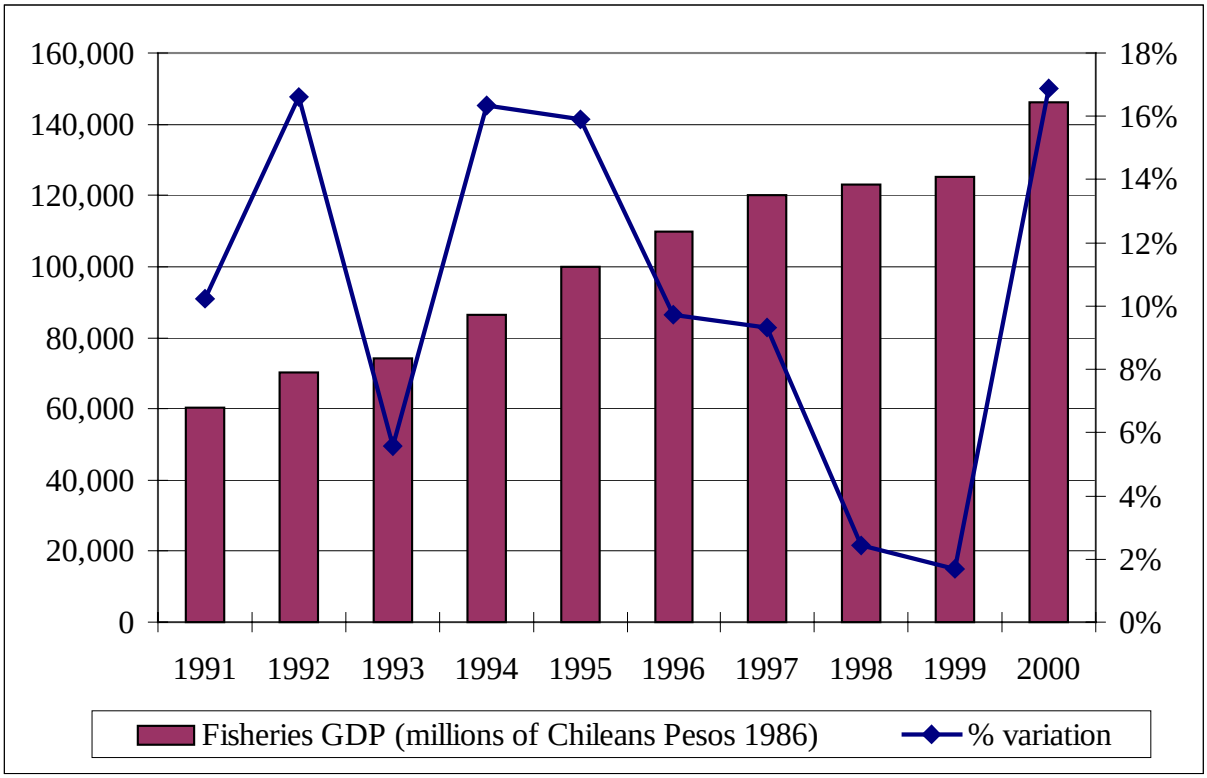
The so-called "*El Niño* phenomenon" has had an important impact in the levels of fishing in the period 1997-2000. However, the persistent increase observed in the fishing efforts and hence the increasing fish landings have also contributed significantly to reach the current levels of catch in these fisheries. This increase in fishing efforts has without doubt raised the question as to whether or not there exists an over-investment in the sector. This represents the major point of discussion between the industry and government.

Peña, J. (2002)[42] argues that the lower levels of fishing (and the now notorious scarcity of the different species) are a consequence of the increase in the fishing efforts carried out during the 1990s and the potential over-investment maintained in the sector.

Despite this erratic situation, the fishing sector has increased its share of national income, as can be seen in Figure 13.1. This situation can be explained in part by the increase in the prices of the main sector products, although a cyclical trend is always present, as shown in Figure 13.2.

[42] "Debates sobre Cuotas Individuales Transferibles: ¿"Privatizando" el mar? ¿Subsidios? O ¿Muerte annuncida da la pesca extractiva en Chile?" Estidios Publicos, forthcoming

Figure 13.1: GDP Fishing Sector



Source: Banco Central de Chile (1996, 2001)

Chile has the second largest share of the world market in fishmeal. Together with Peru, the two countries supply about half of the world's production and 70 percent of the world's exports of fishmeal. Fishmeal and oil are the industry's major exports. In the 1990s, fishmeal production averaged 1.3 million metric tons annually, of which about 1 million tons were exported. Fishmeal production has become increasingly dependent on the jack mackerel. Its share of production increased from 20 percent to 60 percent between 1986 and 1996. The average recovery rate of fishmeal plants is about 22 percent per ton of fresh fish. Over 4.5 metric tons of fresh fish are needed to produce 1 ton of dried fishmeal.

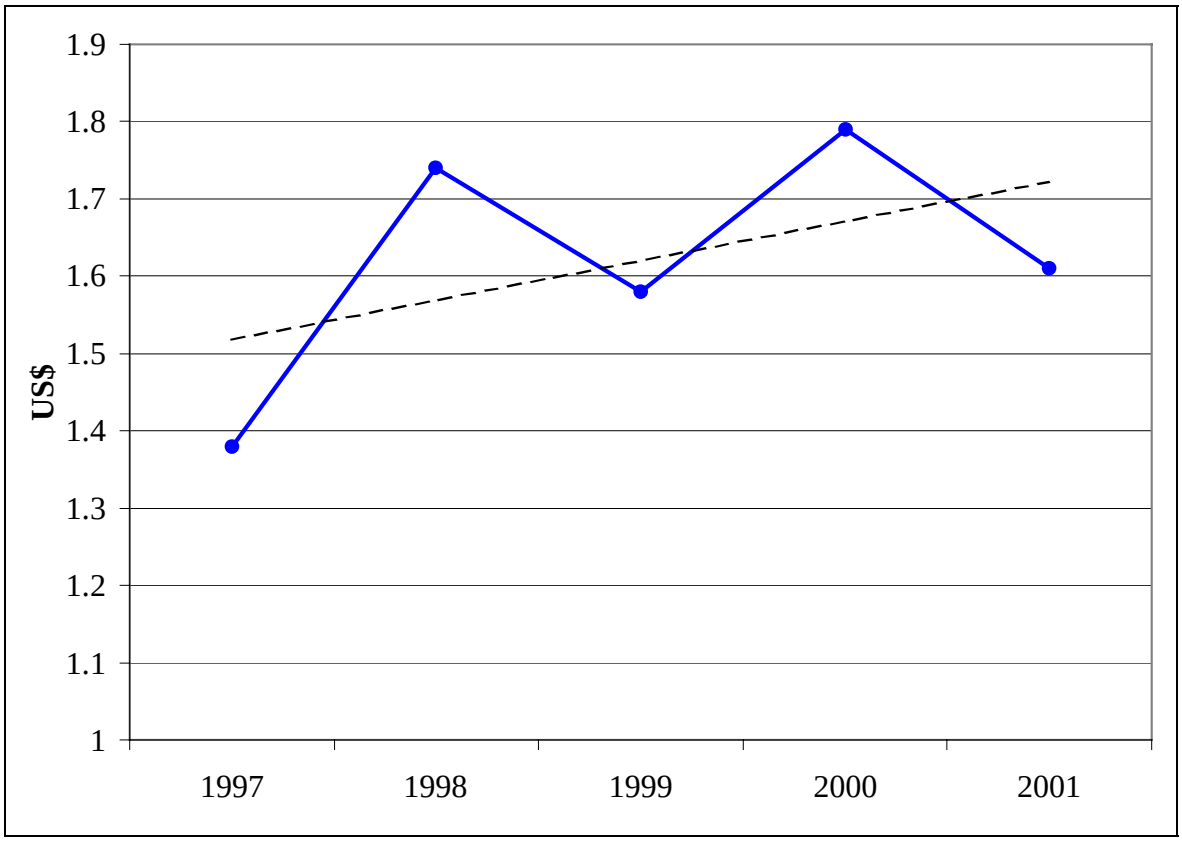
Figure 13.3 shows that section production is currently shifting from producing fishmeal / fishoil to producing fish, at least in money terms – prices are shown in Table 13.2. In general, these are two different markets and they are not full alternatives and/or competitive between them. For example, anchovies, one of the main raw materials for fishmeal (47% of the input), are not used for human consumption, as only 0.4% of production goes to this item.

Table 13.2: Fish Prices

Product	Export Prices (2001) (US$ FOB/tonne)
Fishmeal	514.5
Conservas	1,456.5
Fresh	3,097.7

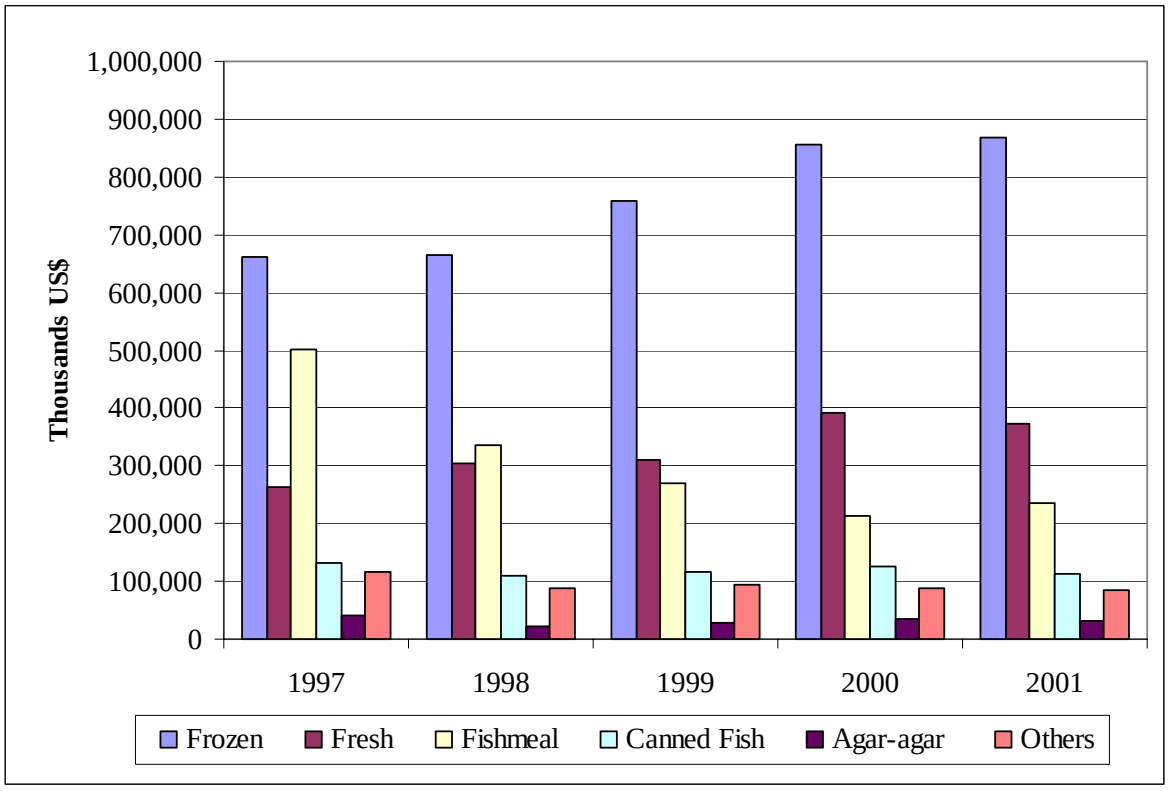
Source: Subsecretaría de Pesca, *Informe Sectorial Pesquero*, Several Issues

Figure 13.2: Average Prices of Fisheries Sector Products in Chile



Source: SERNAPESCA, *Anuario Estadístico de Pesca*, Several Issues

Figure 13.3: Fisheries Sector Exports by Product



Source: SERNAPESCA, *Anuario Estadístico de Pesca*, Several Issues

In the fisheries sector the existing situation in Chile has already experienced processes of international integration (increasing competition, exports, productivity, and output).

In terms of industrial organisation, in Chile there is a developed fishing industry as well as small-scale (artisanal) fishing. Most fishing companies in the industry are vertically integrated, managing fishing fleets and processing plants. Thus, the fishmeal industry is capital intensive, with about $750 million invested in capital assets (e.g. there are around 22 processing plants in the Bío-Bío Region). The sector's exports earnings totalled about US $347 million in 1998. (Cerda *et al*, 1998[43]).

Table 13.3: Main Fisheries. Industrial ands Artisanal: Catch Levels (000 tons.)

	Industrial	Artisanal	% Artisanal
Sardine – Anchovies, Regions V to IX (Region VIII only)	1341.6	482.1 (473.5)	26.4
Common Hake[44]	81.2	22.6	21.8
Southern Hake, Regions X to XII	15.5	9.1	37.0

Source: SERNAPESCA, 1999, Anuario Estadístico de Pesca

Artisanal fishing includes seaweed, shellfish and molluscs. The business is highly labour intensive and is an important source of income and protein, particularly for low-income families. These fishermen are the main suppliers of seafood products to the domestic fresh-fish market. Artisanal fishing also currently provides 25% of the export income from fishery products. Common exports of artisanal fisheries include swordfish, hake, eel and shellfish.

Table 13.4: Artisanal Fishermen

Region	Number Fisherman	Number of recognised Fishing bays	Unions (Numbers)	Professional Association (Number)	Co-operatives (Number)	No. Federations
II	2243	17	22	1	0	1
III	2279	21	14	2	0	1
IV	3997	31	17	27	3	3
V	5270	33	32	3	2	2
VIII	7825	73	46	14	4	1
X	16271	191	215	29	12	9
XI	2593	19	13	8	0	1
XII	3538	11	12	2	3	1
Tot. Country	**48642**		**426**	**95**	**24**	**23**

Source: SERNAPESCA, 1999, Anuario Estadístico de Pesca

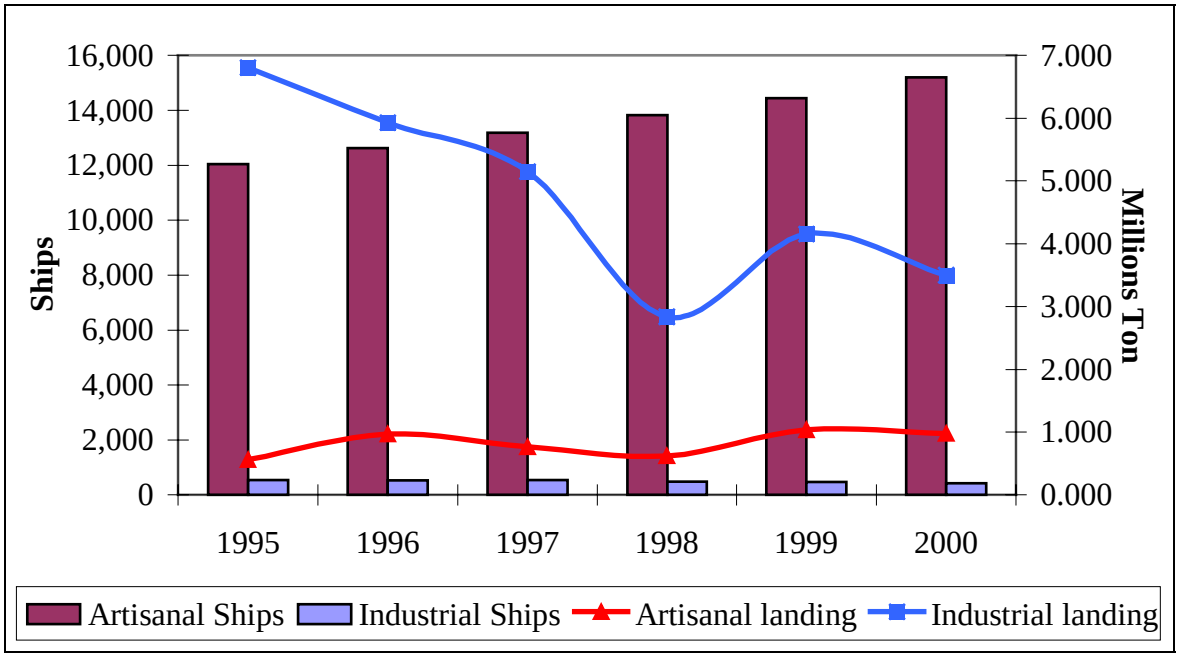
In Chile, competition for fishing resources between the industrial and artisanal sectors tends to concentrate on a limited number of species, see Table 13.3, although their capture is concentrated in regions where the artisanal sector is dominant, as shown by Table 13.4.

[43] Cerda, A., Aliaga, B., Dresdner, J., Bobenrieth, E., Quiñones, R., Sepulveda, A. Galvez, M., Hernandez, A. 1998. "Evaluación bioeconómica de la pesquería industrial de jurel en la zona centro-sur, Fase I", Informe Final Proyecto No. 95-12 del Fondo Investigación Pesquera No. 95-12.

[44] Main Regions with Artisanal Fishing, Region III (2,730 tons.), Region IV (12,320 tons.), Region VII (3,171 tons.), and Region VIII (4,258 tons.).

Figure 13.4 shows how these two industries, industrial and artisanal, have evolved in recent years, which have been marked by a major international economic crisis. This situation has not prevented a significant increase in the artisanal fishing industry, which has increased in size as fishermen formerly employed in the industrial sector have joined it.

Figure 13.4: Artisanal and Industrial Fishing: Ships and Landings



Source: SERNAPESCA, *Anuario Estadístico de Pesca*, Several Issues

Data on employment by gender cannot be separately identified for the fishing industry from agriculture in general. No data on asset ownership by gender has been found. Probably the most significant information to have available would be case studies of the gender division of labour both in the commercial and the artisanal fishing industry.

13.2 Regulatory and Institutional Setting

The fishery sector has been regulated in Chile since 1931. Chile's environmental laws and regulations address the issues of stock depletion, water contamination and air pollution that result from fishing. Chile relies mainly on command and control measures to protect the fishing stock range, such as restrictions on the number of vehicles, gross tonnage capacity and catch sizes. Alternative market-based policy regulatory instruments are on the agenda, such as transferable quotas.

Three institutions are in charge of regulation and control of the fishing sector in government: the Ministry of Economy, the Under-secretariat of Fisheries (Subsecretario de Pesca) and the Directorate of the National Fisheries Service (SERNAPESCA). The first two, the Ministry of Economy and the Under-secretariat of Fisheries, are primarily regulatory, while the SERNAPESCA is dedicated to control and enforcement. The Undersecretary of Fisheries and the Director of SERNAPESCA both report to the Minister.

To ensure the sustainability of fishery resources, the 1991 General Law on Fisheries and Aquaculture authorizes the Minister of Economy to a) impose

biological bans or closures on a defined fishing resource and fishing area or to b) establish annual catch quotas for a species in a given fishing area.

These administrative measures are applied through a Supreme Decree, which is signed by the Minister of Economy after taking into consideration a technical report prepared and submitted by the Undersecretary of Fisheries and after officially informing the proper Zonal Fisheries Council[45].

"Ley 19713" provides for maximal catch limit per owner. A register of artisanal fishermen exists; defined fishing grounds are reserved for those registered. As noted above, fish stocks have declined. This decline suggests that although the regulations have improved, their implementation and enforcement have not kept pace with the situation facing fishing stocks, both from the level of fishing and from the El Niño effect.

All vessels pay an annual license fee[46], but the fee is not dependent on the type of fish caught or the scarcity of the resource. However, regulators have in the past bent to industry pressures to grant more licenses. Designing policies that reflect the scarcity of each fish species requires the availability of detailed information on fish stocks and their eco-systems as a whole. While considerable information is available on Chilean fishing stocks, there is agreement among concerned parties that benefits can be derived in terms of improved policies from an increase in information.

13.3 Sector Environmental situation

In the fishing sector, the three major environmental issues in Chile are (i) over-fishing, (ii) water contamination, and (iii) foul odours.

See for a complete review of these three issues Cipma (2000), where some of the points here discussed were developed.

(i) Sustainable Yields, Over-fishing and Stock Depletion

One indicator of the risk of over-fishing is the sustainable yield, which is defined as the quantity of fish that can be caught per year without a change in fishing effort. In theoretical terms, if fish catches reach the maximum sustainable yield, the profitability of the sector begins to decline. As mentioned-above, there is increasing concern in Chile about over-fishing and the amount of information available about sustainable yields.

Implementation of other regulations during the period 1991-1998 ran counter to general policy objectives on occasion. For example, access to the jack mackerel industry has been opened three times (1991 to the VIII region fisheries; 1992 to the V region fisheries; and 1997 for the X region fisheries) after the first closure took place in 1986. By early 1997, the percentage of undersized fish caught exceeded the legal limit. In response, the government took positive policy action to impose the first ban on jack mackerel in April 1997. But even during this crisis, implementation was not steadfast. The Ministry of Fisheries authorised some vessels to operate during the ban. And some vessels from the industry sector illegally harvested the two main substitutes, sardines and anchovies within the five mile exclusive zone for artisan fisheries. They thus risked over-exploitation of the stock. In 1998,

[45] Consulting boards that include representatives designated by the government, several interest groups from the private sector (e.g. industry, artisanal fishermen, labor unions, etc.), the Chilean Navy, regional universities, environmental NGOs, and other technical agencies.

[46] Fees range from $55 - $110 per metric tonne.

another ban was imposed from the beginning of March to the end of May but enforcement again was weak[47].

Despite several regulatory measures to limit catches of fishing resources, with the objective of stopping the increase in total hold capacity of the fleets throughout northern and central-southern Chile, the political and technical capacities to implement such policies have, in the past, been weak. Indeed, for example, due to economic and political pressures, additional fishing licences for the jack mackerel were granted and in a few years prior to 1995 the fleet increased dramatically as shown in Table 13.1 above.

(ii) Water Contamination

The industry contaminates water bodies by releasing vast amounts of organic material produced during the discharge of vessels and in fish processing factories. This can drastically reduce available oxygen in water systems. Around Concepción City, where Chilean fish processing is concentrated, closed or semi-closed bays are particularly susceptible to water contamination. A good example of this situation is shown in Table 13.5, where the rate of discharge of liquid effluents into Bahia de Concepción and two indicators of contamination (BOD_5 and total suspended solids) by major fishing companies are presented.

There are several laws regulating water effluents, forbidden the discharge of wastes, oils, washing waters, toxic substances, etc. into national waters. Additionally, as discussed for other sectors, a 1994 law requires environmental impact assessments for all projects involved in exploiting, cultivating, and processing of hydrobiological resources. Thus, the government regularly monitors liquid effluent emissions from all fishing companies. Water quality standards are becoming stricter.

(iii) Air Pollution and Odours

Air pollution is mainly a problem in fish processing. However, no data are available on this problem in Chile. To produce fishmeal and oil, fresh fish is forced through long steam cookers by a screw conveyor. Then the cooked mash is pressed to remove water and oil and dried by either direct combustion or indirectly through steam.

Thus, foul odours are emitted as fresh fish is transported from the ports to the processing facilities and stored. During this time, raw material decomposes, releasing ammonium and other amino acids that cause odours. One of the cities most affected by this problem is Talcahuano, one of Chile's main fish processing centres. Due to this problem of odour emissions from fishmeal plants, Talcahuano was declared a city in an environmental emergency situation (saturated city, according the terminology of the Chilean Environmental Agency, CONAMA). This particular situation caused widespread concern in Chile.

[47] Also see Peña (2002).

Table 13.5: Liquid Effluents by Major Fishmeal Producers

Name	Effluent	BOD_5	TSS	Oils and Fats
	L/sec	mg/l	mg/l	mg/l
Camanchaca	43.6	2,100	2,440	1,190
Iquique	11.2	12,040	14,020	6,860
Vásquez	2.58	1,240	1,440	710
San Jose	8.1	10,240	11,930	5,830
Golfo	N/A	9,960	320	250
Landes	93.6	740	860	420
Tamarugual	0.3	340	400	200
San Miguel	35.4	930	680	530
Alimar	193.6	440	50	250
Itata	154.7	670	780	380
Londor Saavedra	0.1	1,530	1,120	1,090
Bio-Bio	94.8	1,060	1,240	600
Timonel	0.1	690	800	390
Torres y Riveria	41.7	880	1,020	500
Confish	16.4	2,040	2,380	1,160
San Pedro	283.5	1,130	1,310	640
Pacific Protein	181.2	670	780	380

Source: CIPMA (2000) quoting CONAMA, 1997 (1993 data).

Given this scenario, in 1995, an agreement between the fishery sector and the Regional Health Authorities in Talcahuano was reached stating that within a three-year period all fish processing plants should install a gas treatment plant. Mainly to reduce costs, more than two thirds of the companies switched from the combustion of coal to petroleum in the boiler houses, thereby reducing sulphur emissions. Fuel-switching also helped these companies meet air quality standards (CONAMA, 1996). It is important to stress that maximum emission standards for fishmeal plants in Chile are equivalent to norms set by the US Environmental Protection Agency.

13.4 Summary of the EU-Chile Trade Agreement concerning the sector

The major trade measures in the EU-Chile trade agreement relevant to the sector are:

- Most of the products will be covered by the free-trade agreement over 0 to 10 years
- The possibility exists of EU member state companies investing in the Chilean fishing industry on a reciprocal basis.
- The 200 miles exclusivity zone is respected
- The Chilean fishing quota remains unchanged

There are two major trade measures in the EU-Chile trade agreement relevant to the sector.

Firstly, EU tariffs on fish and (processed food) fish products will largely be eliminated either immediately or over a period of up to 10 years. For some items, this is achieved through the introduction of a tariff quota that, for most products, increases to cover all imports in the relevant category over a transition period. A few tariffs and tariff quotas will remain at the end of the transition period, though the vast majority of products are covered by the agreement. Since the previous tariff levels were significant in many cases, this trade measure is expected to have a very significant impact on Chilean fish and fish product exports to the EU. In terms of economic impact, this is the most important trade measure in the fishing sector.

The second trade measure in this area is the enabling of EU Member State companies to invest in the Chilean fishing industry, including in fishing boats, provided that Chilean companies are reciprocally permitted to invest in that Member State's fishing industry[48]. It is likely that investment in fishing boats will be accompanied by investment in processing facilities. The SPS agreement will also have a positive effect on this sector as exports to the EU are facilitated.

The Chilean fishing quota remains unchanged. While in principle there ought to be no reason for a direct impact of the EU-Chile agreement on renewable fish resources, this important and complex issue is discussed further below.

The GTAP modelling exercises projects growth in output and long-term employment for this sector, which covers ISIC categories 1301-1302. The sector does not export much directly, instead delivering to the processed food sector. Fisheries output growth is thus responsible for some of the projected export growth in the Processed Food sector.

Chilean statistics on the fishery sector, including its economic data, fully cover the physical and economic activities in Chile's waters. Since the model projections are based on this data, this information gives the study some assurance that the model projections are based on an appropriate representation of the sector.

[48] Previously, the law gave a discretionary authority to the Chilean authorities as to whether or not to grant a licence. The agreement with Chile eliminates this element of discretionary authority, but the conditions of reciprocity remain unchanged.

13.5 Sustainability Impacts

Table 13.6: Summary of sustainability impacts in the Fishing Sector

	Dimensions / Significance Criteria					
Themes:	**Overall Direction & magnitude** **A**	Existing conditions B	Equity C.1	Equity: Gender	Reversibility D	Capacity to change E
I Economic						
1. Real income	△	△	▽	?		△
2. Net fixed capital formation	△	△				
3. Employment	△		▽	?		△
3.1 Self/informal employment	▽	▽	▽	?	▽	△
4. Consumer effects	▽					
II Social						
5. Poverty	↕	▽	▽	?		△
6. Health and education	?					
III Environmental						
7. Environmental quality	▽	▽				△
7.1 Water contamination	▽	▽				△
7.2 Air contamination	▽	▽				△
8. Biological diversity	?					
9. Other natural resource stocks	▽	▼			?	△

For explanation of symbols, rows and columns, see Section 5 or Section 19.

- **Economic Sustainability**

  The economic impact of the EU-Chile Trade Agreement on the sector has been carefully analysed using both GTAP and detailed information about the Chilean fishing sector. The projected results are clearly for an overall increase in sector output and employment within Chile. This increase in employment is expected to occur in the handling and processing of higher value fisheries and aquaculture products, both in the fisheries and in the processing stages.

  The model growth projections are compatible with the fixed Chilean fish quota because the growth of output is projected in value and not volume terms. With greater access to EU markets and availability of investment funds, sector production is expected to shift somewhat toward producing higher value products.

  The aquaculture subsector, for example, is unconstrained by quotas and is expected to increase its output and exports. These will be mainly oriented to the processed food sector.

  EU subsidies are available to EU fishing companies to remove their fishing boats from EU waters. If these subsidies can be used to transfer their fishing boats to Chilean waters, then this would lead to competition issues. Firstly, there would be the issue of fair competition between EU and Chilean owned

boats. Secondly, this could be seen as a capital subsidy, which would lead to excess investment in the Chilean waters fishing fleet. To the extent that industrialised fishing boats compete with artisanal fishing, such capital subsidies would have the effect of reducing the cost of investment and so extend the competitive advantage of industrial fishing-boats relative to artisanal boats described in section 13.5.

On the other hand, European investment in the fishing sector could possibly include investment in artisanal fisheries and/or investment in facilities that process the product of artisanal fishing.

- **Environmental Sustainability**

  In the fishing industry, environmental threats exist from over-fishing and from the environmental impacts of both low-technology operators, both in fishing, which produces water pollution, and in fish processing, which produces air and water pollution.

  In the past there has been pressure within the industry against reducing fish quotas; the existing regulatory system, while it has progressively improved, is still being improved. The existing quotas have not always been fully enforced. Existing command and control measures have not always been sufficient to protect the resource base; new regulations are being prepared.

  Past mechanisation led to increased pressure on fish stocks. In recent years, regulation has improved though this process is clearly not complete. If the measures that have been and are being taken to protect fish stocks are effective, then the EU-Chile trade agreement will indeed have no impact on fish stocks. If, on the other hand, a failure of the regulatory system were to occur, then the increased demand brought about by the tariff reductions might increase the incentive to fishermen to evade the quotas. The competitive pressures brought about by increased investment in the industry, either by domestic or EU owners, might have a similar effect.

  The discussion within Chile has generally focussed on the possibility that the presence of European investment in the sector will potentially worsen the fish stocks situation. However, any impact on over-fishing requires some inconsistency in regulation to occur, whether or not the EU-Chile Agreement had been made. Assuming that such regulatory problems occur and within the context of increased demand for fish and increased investment, the presence of EU-owned boats is not the only source of risk.

  If the aquaculture sector exempt from quotas is going to grow as a consequence of the EU-Chile agreement, there could be a risk from salmon farming of damage to the local marine environment, partly from pesticides pollution.

- **Social Sustainability**

  The overall impact within the sector is for increased employment, which will have important positive consequences for social sustainability in fishing communities.

  Usually in artisanal fishing communities there is very weak labour mobility, which increases the risk of greater levels of social vulnerability and poverty. Lower levels of productivity in the artisanal fishing sector are the results of the existing poverty situation and are not the result of ‘fair’ market competition. Regarding the social situation we can identify an issue of concern that is an existing risk but is to an extent linked with the EU-Chile agreement.

The industrialised fishing sector will have greater market opportunities from lower tariffs and increased efficiency from new investment, either as a direct consequence of the admission of EU ownership of boats or as an indirect result of increased market opportunities.

To the limited extent that artisanal and industrial fisheries are in competition for the same stocks, where investment increases in industrial fishing-boats, these will become relatively more efficient compared to artisanal fisheries. However, artisanal fisheries will benefit from the tariff eliminations. Given the recent increase in the numbers of artisanal fishing-boats (Figure 13.4), it is possible that a negative employment effect will predominate for artisanal fishing. However, it must be stressed that a positive overall employment outcome is expected in the fishing sector.

In many areas, artisanal fishers will be able to be employed in the wider industry, as employment is expected to increase. However, the loss of artisanal fishing employment may be significant in certain local areas where fishing is the main productive activity, where workers have no other alternative skill and where there is little possibility of alternative employment or labour mobility. This localised impact on artisanal fisheries may coexist with the more important increased employment in the sector as a whole. The impact on artisanal fishermen could probably be maintained for a considerable time unless there is a firm policy to aid the fishing workers. The impact on artisanal fishing communities could well be differentiated by gender on the basis of a gender-based division of labour.

It should be emphasised that reduction in artisanal fishing will occur with or without the EU-Chile trade agreement. In particular it is not necessarily linked to the introduction of EU ownership of boats. The overall increase in sector employment is expected to outweigh the loss of artisanal employment. Without the Agreement, much of the loss of artisanal fishing employment would still occur and the employment increase elsewhere in the sector would not occur.

- **Current Policy Development for Sustainability**

The potential impacts of the EU-Chile Trade Agreement in this sector cannot be analyzed without considering the existing situation, the concerns of the Chilean authorities and the current sector policy developments. The sustainability impacts are generally not new in kind and we can benefit from a discussion of past experiences in the sector.

The trade agreement tends to highlight and reinforce the existing sector economic, social and environmental trends and thus any sustainability impacts. In other words, the higher demand, changes in relative prices and increased mechanization produced by the agreement will have similar effects to those experienced in the sector over the last decade. Moreover, the Trade Agreement appears to be influencing current sector policy developments.

The social and environmental impacts of the agreement in the fishing sector will crucially depend on the development of the two issues. These issues exist independently of the EU-Chile agreement but in some cases are likely be affected by them.

The first issue is whether or not the fishing quotas are going to be maintained at sustainable levels and implicitly whether the regulatory authority will have the capacity to enforce them. Linked with this is the policy decision on how to

reform fishing quotas in order to ensure economic and environmental sustainability and enforceability.

Current proposals are to implement a system of tradable fishing rights, otherwise known as market-based instruments (MBI). This in principle would assist a more environmentally and economically efficient exploitation of the fixed stocks and so protect against stock depletion..

However, this policy raises the important social sustainability issue about whether and how the existing property rights of the small-scale artisanal industry over fishing resources are going to be respected. This could be achieved either through an initial allocation of fishing quotas, by government guarantee of a quota or by implementing fishing rights that are tradable only among the artisanal fishing sector.

While all three possibilities for protecting the artisanal fishing community have their advantages and disadvantages, if no protection is afforded (by example, through auctioning all tradable fishing permits), then there will be potentially high social costs.

In order for artisanal fishing communities to participate in managing fish stocks, they need to own marketable rights and to be empowered to manage their resources.

Solutions to the problems facing the sector can only be achieved through dialogue. Representatives of fishermen, both industrialised and artisanal, regional authorities and regional environmental agencies (COREMAs) need to play an active role in the policy-making process in the sector.

Efficient enforcement and legal 'punishment' are essential elements for any regulatory system to work. Without these variables operative the economic efficiency and sector sustainability can be seriously questioned with or without any trade agreement.

13.6 Mitigation Measures

Given this situation, the mitigating (flanking) measures need to include measures that are needed to achieve overall sustainability in the sector, with or without the Trade Agreement. Mitigating measures must be seen within the overall sector context.

1. Within Chile, the evaluation of the current and future situation of the sector must be carefully carried out, improving the process of data collection and its analysis. More resources need to be devoted to assess the environmental threats of over-fishing. This will require data collection and analysis of the stock size, reproduction, and interactions between different species, particularly for those species native mainly to Chilean waters. Despite the important efforts that have already been made, more comprehensive studies of the maximum fishing effort that can be sustained should also help design more effective policy instruments.
2. Basic issues to be taken into account by the main participants in the sector are: (i) how to eliminate the regulator arbitrariness on when and how much must be the catch limits, and (ii) how to introduce incentives to reducing the waste of resources produced by the industrial sector's "discarding" process, when just the most profitable species are retained. Support for the analysis of different policy options and of dialogue within the sector could be of great importance.

3. Measures should be taken to ensure that the European investment in the Chilean fishing fleet is an investment in the sustainability of Chilean fishing reserves. EU institutions, fishermen and environmental organisations have experience in developing a different regulatory environment and this experience could be a positive element in developing the regulatory structure and in stock conservation in Chile. Support could be given to developing an EU-Chile dialogue on fish stock conservation. At an absolute minimum, European owned boats must fully and consistently respect quotas and to be seen to do so.
4. The artisanal fishing community needs to be empowered and financed to participate in the management of fishing resources and to face the serious challenges that face them. This requires access to alternative sources of employment, either within the fishing industry as a whole or in other sectors.

There are possible sustainability risks in implementing the EU-Chile trade agreement in the fishing sector. Is there a better alternative? The fundamental problems in the fishing sector pre-exist the EU-Chile trade agreement and so will not be solved by its abandonment or postponement, which would cause the loss of much-needed new employment opportunities. A sustainable solution requires dialogue and management of saleable resources that are allocated by agreement between the groups concerned, with full protection for the rights of artisanal fishermen. The arrival of the EU-Chile trade agreement does make a solution more urgent but also perhaps more possible

14. Sector study: Land Transport, Electricity and Tourism[49]

14.1 Electricity

- **General Overview**

  The electricity sector in Chile has been a very dynamic sector during the past decade. The installed generating capacity has grown at an annual rate of 9% between 1990 and 2000[50], increasing from 4 400 MW in 1990 to over 10 300 MW in 2000. Gross generation has also grown at a rate of 8.5% per year in the period, growing from 18 000 GWh in 1990, to more than 40 000 GWh in 2000. Before 1997, Chile's electrical generation had been largely based on hydropower (up to 75% of total generation in 1992) and, to a lesser extent, on thermal coal powered plants.

  However, a recent trend has been the incorporation of new combined cycle plants served by natural gas. This has been made possible by the introduction of gas pipelines from Argentina which have pumped natural gas to Chile since 1997. The increase in generation capacity since then has been basically based on natural gas powered plants. As a result, thermoelectric power from natural gas has increased, reaching 54% of total thermal generation in 2000, while coal based thermal plants have reduced their share in thermal generation from 92% in 1996 to 38% in 2000. Consequently, in the recent drought year 2000, thermal generation accounted for 71% of total electric generation.

  Chilean electrical markets were liberalized during the 1980s. State owned companies were privatised beginning in 1986 and prices are determined by marginal costs of production of energy[51]. New plants result from decisions by private companies, not planning by a centralized authority. Even though there is an indicative investment plan for the electric sector, it tends to follow rather than lead investment decisions. The private sector has preferred thermal plants over hydro plants due to the high investments demanded for the construction of hydro plants and the long payback period required. In the next few years it is expected that one new hydro plant will be finalized (RALCO[52] – see below), while the rest of the additional capacity will be obtained from thermal combined cycle natural gas plants. Table 14.1 shows the power plants currently under the Environmental Impact Assessment process, which could be expected to generate additional capacity in the near future.

  Coal powered plants – some built fairly recently – have attempted to compete with natural gas plants. Some have been allowed to use petcoke – the solid waste produced in oil refining – that is much less expensive than coal but is

[49] Basic references for this Section are as follows (see also Section 12 - *Sector study: Processed Foods, Chemicals, Non-Ferrous Metals and Mining*):

- CNE "National Energy Balance". Several issues.
- O`Ryan R. and L. Larraguibel (2000) "Contaminación del aire en Santiago: ¿qué es, qué se ha hecho, qué falta?" Revista Perspectivas en política, economía y gestión Volumen 4 Nº1, Santiago, Chile.
- O`Ryan R. and T. Turrentine (2000) "Greenhouse gas Emissions in the Transport Sector 2000-2020: Case Study for Chile" University of California, Institute for Transportation Studies Working paper UCD-ITS-RR-00-10, November.

[50] CNE – Comisión Nacional de Energía.

[51] The price is determined by the marginal cost of the last generator entering the system in order to satisfy electric demand.

[52] Ralco is a 570 MW hydro plant being constructed in a land considered to be sacred land for the Pehuenche people, a branch of the Mapuche people.

highly polluting. Additionally if the price of natural gas increases, coal will become competitive again.

Consequently, the trend toward increased use of natural gas can be affected by:

1. Coal powered plants that could re-enter the system.
2. Possible interconnection of electric power lines with Argentina, which could cover excess demand without introducing new plants in Chile.

Table 14.1: Power plants in Environmental Impact Assessment Process

Name	Location	Fuel Used
Candelaria	VI Region	Natural Gas
Mapocho y Molina	Metropolitan Region	Hydropower
Renca	Metropolitan Region	Convert current fuel (coal) to Natural Gas
Totihue	VI Region	Natural Gas

Source: www.conama.cl

- **Environmental and Social Issues of concern**

  There are environmental issues of concern in the electric sector. The first issue is the use of petcoke as a fuel in coal plants. This issue is important due to high pollution in areas surrounding these plants and the consequent generation of multiple environmental problems such as: acid rain from sulphur dioxides, health effects, corrosion on buildings and visibility reduction from particulate matter.

  A second issue of concern is that natural gas thermal plants, although much less polluting than other fuels, can still have local impacts that cannot be disregarded. They are usually built close to where demand is concentrated, in highly populated and industrially active regions.

  A final issue, is that Chile's geographical landscape is favourable for hydro plants, especially in the central and southern areas. In many of these locations there are natural forests that could be affected if a hydro plant is built. This could also lead to negative social consequences regarding the indigenous population, since hydro plants may also affect areas where people from indigenous cultures live, which may generate conflicts between these people and the authorities. The case of RALCO is particularly sensitive. The land where this 570 MW hydro plant is being constructed is considered to be sacred land for the Pehuenche people, a branch of the Mapuche people. This indigenous culture has approximately 80 families living in the area, where a cemetery is also located. There is opposition to the construction of the power plant for these reasons and due to the expected environmental impact. The opponents of the scheme point out that other sources of generating capacity are economically viable, as indicated above. Application of recent legislation has resulted in a review of the project and hence delays to its construction and compensation to those affected, leading to higher costs than initially expected.

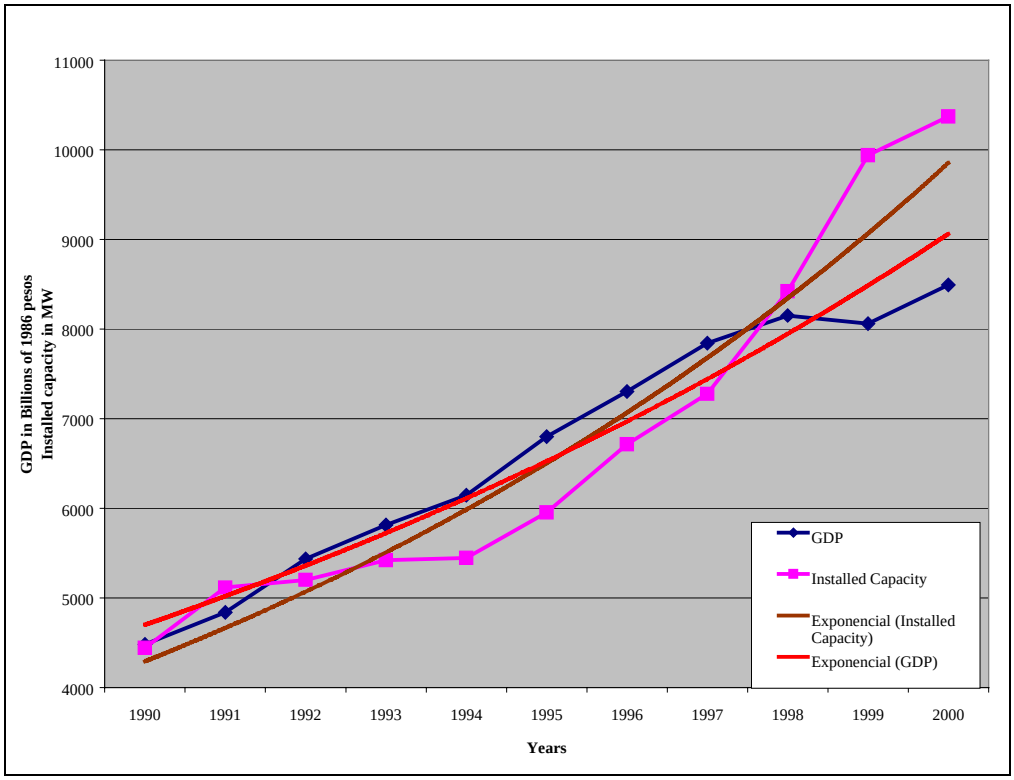
- **Economic sustainability**

  For the purposes of the GTAP simulations, the electricity sector is part of the Electricity, Water and Other Manufactures Sector. Defined in Table 8.5, it

contains Electricity, Gas, Steam, Water and the manufacture of jewellery, musical instruments, sporting and athletic goods and miscellaneous manufactures; electricity and the slower growing water industry make up most of this sector. The output share of this sector is shown in Table 9.2[53].

The GTAP results show that this sector is expected to grow 0.04% due to the EU-Chile agreement. This understates the probable impact of the trade agreement in this sector. The growth of the electricity sector over the past decade has been greater than the growth of GDP: 9% annual growth between 1990 and 2000, against 6.7% in annual GDP growth for the same period (see Figure 14.1).

Figure 14.1: GDP and Installed Capacity in Chile 1990-2000



Source: Banco Central de Chile and CNE

(see also references at start of Section and at Section 12 - Sector study: Processed Foods, Chemicals, Non-Ferrous Metals and Mining)

Installed electricity capacity has grown at 1.35 times the rate of GDP growth. If this relation is maintained, we should expect an increase around 0.67% in the electricity sector. Applying this growth to the 'Electricity, water & other manufactures' sector, we expect an output increase in the Electricity, Water and Other Manufactures sector as a whole as a result of the EU-Chile trade agreement of around 0.4% rather than the GTAP estimate of 0.04%. This projection is adopted for sector output and employment.

Considering that the total installed capacity of the electricity sector for 2000 was slightly over 10 300 MW, the additional 0.67% increase in the electricity sector due to the trade agreement would require installing 70 MW more than the base case. This would correspond part of an additional small or medium sized power plant that could be served by either a thermal plant running on natural gas or coal or a hydro power plant.

[53] Central Bank of Chile www bcentral.cl provisional data show that in 1997, value added in the electricity, gas and water sector was 177 bn 1986 Pesos.

- **Social and environmental sustainability**

  The social and environmental impacts of the agreement depend on the choice of plant. As mentioned above, if a petcoke thermal plant supplies this additional capacity, there may be a potential environmental problem. In the same way, to a lesser extent natural gas plants and hydro plant may pose certain concerns on the sustainability issue.

  Chilean national environmental law requires an Environmental Impact Assessment (EIA) for all major projects. All affected parties can participate in the EIA through a participatory process. This framework generally ensures that most significant negative impacts are dealt with. If negative effects arise, mitigation measures are required by the authority in order to give a green light to the project.

14.1.1 Sustainability Impacts

Table 14.2: Summary of sustainability impacts for the electricity sector

	Dimensions / Significance Criteria				
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C	Revers-ibility D	Capacity to change E
I Economic					
1. Real income	△		?		
2. Net fixed capital formation	△	△			
3. Employment	○		?		
4. Consumer effects	△				
II Social					
5. Poverty	?				
6. Health and education	○				
III Environmental					
7. Environmental quality	▽	▽	?		△
8. Biological diversity	?	▽		?	△
9. Other natural resource stocks	?	▽	?	?	△

For explanation of symbols, rows and columns, see Section 5 or Section 19.

The existing situation has negative impacts on social and environmental issues such as air pollution from thermoelectric generation, impacts on the indigenous population and natural forests due to the construction of hydropower plants.

The trade agreement should have positive effects on real income in the sector, due to higher economic activity and on net fixed capital formation due to the construction of new power generating or distribution plant. If additional capacity is fulfilled by thermal plants running on natural gas, environmental quality should have minor local negative impacts nearby the plants, due to local polluting emissions and global impacts due to higher CO_2 emissions. However, if coal is used, both local and global impacts may be much higher. On the other hand, if additional capacity is fulfilled by hydro-power, some social issues concerning indigenous people may appear, together with impacts

on natural forests and biodiversity. Finally, if the interconnection of electric lines with Argentina takes place, both social and local environmental issues should disappear within Chile. This final scenario would also reduce the positive impacts on real income and net fixed capital formation.

In sum, the EU-Chile trade agreement will lead to some additional demand for electricity. This demand can be met by different methods of supply, which have very different potential impacts on social and environmental sustainability. The EU-Chile trade agreement impact on sustainability in this area is therefore uncertain. There is thus no causal link between the EU-Chile trade agreement and any specific method of generating the additional electricity demanded.

14.1.2 Mitigation Measures

Mitigating measures could affect the choice of electricity supply or the environmental impact give a prior choice of electricity supply.

The selection of electricity supply mechanism, the choice of generating technology, whether to install an interconnection with Argentina or whether to promote energy conservation methods) is generally outside the scope of the EU-Chile Trade Agreement, as increasing demand for electricity largely does not depend on the agreement. However, a possible mitigating measure might include support for demand side management, in particular promotion of energy efficiency, which could lead to lowering costs for some industries.

14.2 Land Transport

- **General Overview**

Chile's land transport sector has been very dynamic in the past decade. Transport and communications have grown more than 2.5 times between 1985 and 1998, and the sector continues to grow strongly. The number of vehicles in Chile has increased from 1.1 million in 1990 (over 650 000 cars and station wagons) to over 2 million in 2000 (over 1.1 million cars and station wagons).

The bus is the main mode used in urban transportation, however its relative importance is decreasing over time, while private cars are increasing their share of transportation. In Santiago between 1977 and 1991, cars increased their share of passenger travel by more than 60%, while the bus share fell by 27%. Nevertheless, the bus still accounts for most passenger trips. Urban passenger kilometres travelled in Chile in 1997 by mode was: 66% bus, 26% car, 4% walking, 2% taxi and 2% subway / metro.

Interurban transportation has also grown. Freight is mainly carried by trucks, which account for 86% of interurban cargo, while the rest is divided among trains, air cargo and ships. Passengers are carried mainly by bus, although its share is also decreasing in favour of private cars.

The increase in economic activity is key to the growth in this sector. Higher economic growth will generate even higher demand for transportation, both urban and interurban and passenger and freight. This will imply an even larger increase in car transport due to the current trend that is displacing public transport in favour of the car.

Passenger transport by car is expected to continue growing, despite the efforts of authorities in order to promote public modes. In Santiago for example policies have been implemented to disincentive the use of cars such as: exclusive lanes for buses in some avenues and reduction of free parking lots especially in downtown areas. However increased household income more than compensates the little impact these measures may have: the number of cars is growing at a rate close to 10% per year.

- **Environmental Issues of Concern**

  This fast growth of transportation is an issue of concern in Santiago, Chile's capital city, which houses almost 40% of the population. Transport is directly responsible for most PM-10 emissions, the most critical environmental problem in the city: 25% are emitted directly and another 50% resuspended[54] by vehicles on paved and non-paved roads. This sector is also responsible for 50% of PM 2.5 emissions. Furthermore, the transport sector is also responsible for 94% of CO emissions, 83% of NOx emissions, and 42% of VOC (volatile organic chemical) emissions. Noise is also a matter for concern. A comprehensive study undertaken in 1989 shows that 65% of a total of 134 zones with residential or mixed residential and commercial use have a high level of noise pollution. The risk of hearing loss is significant (57% of the population has at least a small probability of hearing loss). 70% of the population has a high risk of having their sleep affected by significant night noise. The main source of noise is vehicle flow, particularly noise from buses.

  In the last 12 years, significant efforts have been made to reduce the impact of transportation on air pollution, including the introduction of catalytic converters in new cars beginning in 1992, the restriction of automobile use in pre-emergency and emergency periods for all vehicles and the elimination of the oldest buses and regulation of taxis. During this decade, the Urban Transportation Plan for Santiago (PTUS) as well as the Air Pollution Prevention and Decontamination Plan (PPDA) have developed several measures in order to reduce pollution in Santiago. Despite these efforts, pollution has fallen only about 20% in the decade, since economic growth has led to an ever-increasing number of vehicles that offset the improvements. Emissions must be halved in the next decade to reach the desired air quality goals.

  Other important fast growing cities also are suffering from increasing of air pollution problems, noise and congestion due to mobile sources: Iquique, Valparaiso/Viña del Mar and Rancagua.

- **Economic Sustainability**

  The GTAP outputs show that the "trade (wholesale, retail, restaurants and cafés), transport and communications" sector will increase its output in 0.19% as a result of the agreement. All the services in this sector are closely linked to the overall growth in the economy. Transport has historically grown at approximately 1.4 times the rate of GDP and the trade sector has grown at 0.7 times the pace of GDP, so it is possible that the sector projection underestimates growth in transport. On the other hand, the transport content of the growth brought about by the EU-Chile trade agreement may be somewhat different from 'normal' growth. Moreover, the very large size of this sector (22.3% of output in 1997 – Table 9.2) means that model projections are more likely to be accurate. The analysis of the economic impact of the trade agreement on the services sector in Section 15 might

[54] a renewed suspension of insoluble particles after they have been precipitated.

suggest that transport will grow faster than the GTAP projections. The faster output growth is adopted as the basis of sector output ad employment.

The statistical convention is that all transport costs for exports are treated as credits to Chile and transport costs for imports are treated as debits, regardless of the residence of the transport entities concerned[55]. While GTAP projects export and import flows to be basically unchanged, any divergence in their growth paths may skew the resulting transport balance.

- **Environmental Sustainability**

The main policy issue in this sector is air pollution control. Santiago's air pollution is motivating efforts to restrain vehicle use and enhance public transportation. However, if the current political environment and institutional framework remain, change will be slow. The most politically feasible options are based on introducing new technologies, especially to reduce emissions from vehicles, particularly bus fleets.

In the next few years, several measures to reduce pollution are expected. Buses running on natural gas or hybrid (diesel-electric) buses are likely to be used in Santiago. New light trains and metro lines should also be built. This will result in a positive technical effect. Toll roads and other market-based mechanism are also expected. A recently proposed new public health policy considered increasing the value of permits for diesel cars as well as a higher tax on diesel in order to finance the plan and to disincentive the use of diesel cars. Bus fleets will probably be required not to exceed a given pollution limit that will decrease over time. However the effects of these measures will probably be outweighed by the significant scale effect of increased transport activity.

Public transportation in Chile is mostly privately owned (except the metro). As a result, any new technology that is introduced will most probably increase the costs of transportation and thus tariffs. This is a negative social impact, since most of the population relies on public transport.

14.2.1 Sustainability Impacts

In the sector, the cost of transportation is currently fairly low. However, multiple environmental problems are generated in major cities by this sector, specifically Santiago has severe air pollution problems.

Economic growth is the main cause of the increase in transportation activity. For this reason, the trade agreement is expected to increase transport activity, both urban and interurban, and both passenger and freight.

A negative impact on equity may arise if the cost of transportation is increased due to new environmental restrictions. This is likely to occur with or without the trade agreement.

Environmental quality, more specifically air pollution, is the main issue in this sector. The trade agreement will most likely increase air pollution emissions due to a scale effect. New cleaner technology requirements, especially for buses, may generate a technical effect that could reduce in part this negative effect.

[55] Manual on Statistics of International Trade in Services (MSITS) paragraph 3.67, Interagency Task Force on Statistics of International Trade in Services / United Nations Statistical Commission, unedited draft, September 2001 unstats.un.org

Table 14.3: Summary of sustainability impacts for the land transport sector

	Dimensions / Significance Criteria				
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C	Revers-ibility D	Capacity to change E
I Economic					
1. Real income	△				
2. Net fixed capital formation	△				
3. Employment	△				
4. Consumer effects	?				
II Social					
5. Poverty	○				
6. Health and education	▽				
III Environmental					
7. Environmental quality	▽	▼	▽		△
8. Biological diversity	?				
9. Other natural resource stocks	?				

For explanation of symbols, rows and columns, see Section 5 or Section 19.

14.2.2 Mitigation Measures

Taxes to increase the cost of fuels, particularly gasoline, could reduce the use of the car. However this must be undertaken together with measures that impede the increased use of diesel cars, for example increasing the yearly permit cost of these vehicles without impacting on trucks. Exchange of experience between the EU and Chile in the area of urban transport-related environmental problems could be supported.

14.3 Tourism

The GTAP macroeconomic simulations in section 9 projects that the EU-Chile trade agreement will generate an additional growth in Chile's real income of 0.4% of GDP. This increase in real income is likely to generate an increase in domestic tourism. Moreover, the development of trade relations with Europe may stimulate international tourist flows originating in EU members. Nevertheless, as noted in section 15.5.1, there is no direct effect from the EU-Chile agreement on tourism exports. Growth in tourism as a consequence of the EU-Chile trade agreement is therefore expected to be relatively small when compared with recent trends in services.

Since the development of tourism has the potential for direct links to environmental sustainability problems, as discussed in section 10.15, the projected growth of this sector calls for further examination.

14.3.1 Tourism in Chile[56]

In 2001 Chile earned an estimated US$ 788 million from the expenditure of foreign tourists. This figure equals to 3.4% of the total of goods exports and receipts for services. Income from tourism compares to 9.6% of income from industry (US$8 190.3 millions).

In 2000, major tourism activities (hotels, restaurants) together with wholesale and retail trade, represented 18.7% of Chilean GDP. This sector represented in 2000 15% of total male employment and 25% of total female employment.

In 2001 1.7 million foreign visitors entered Chile either for tourism or business. 71.9% of the visitors originated from Southern American countries, 13.8% from Europe, 10.3% from North American countries, 0.7% from Central American countries and only a 3.3% from countries of other continents. In 2001, 49.4% of the visitors originated from Argentina, 8.0% from Peru, 5.5% from Bolivia, 4.2% from Brazil and 8.0% from the United States. Among the EU members, tourists mainly came from Germany (with 44800 visitors), Spain (36231), France (36221) and the UK (35944).

Tourism inside the country includes both resident and non-resident tourism. To highlight the tourists' preferred destinations inside Chile, several indicators can be analysed: the number of nights spent in lodging establishments, tourist accommodation facilities and restaurants.

Foreign visitors enter the country both by terrestrial means (59.9%) and by air (37.7%). Arrivals are concentrated on five regions which represent over 90% of foreign visitor entries: the Urban Region of Santiago (35.7% of total entries), the Region of Valparaíso (22%), the Tarapacá Region (12.2%), the Region of Magallanes (12.1%) and the Region of the Lakes (9.6%). Turning to the number of beds, the best-equipped regions are Valparaíso, The Region of Lakes, the Urban Region of Santiago and Araucanía.

In 2001, nights spent in lodging establishments were distributed by region as follows: 13,0% in the Region of Coquimbo and in the Region of the Bíobio, 12.1% in the Region of Tarapacá, 11.5% in the Urban Region of Santiago, 11.2% in the Region of The Lakes and 10,4% in the Region of Valparaíso. Each of the remaining regions had less than 10% of the nights spent in lodging establishments.

[56] Figures given in this section are based on INE, *Anuario de Turismo 2001*.

Tourist accommodation facilities are mostly located in central regions of Chile. As shown in Table 14.4, the Region of The Lakes represents 20.3% of lodging establishments, followed by the Region of Valparaíso (19.3%) and the Urban Region of Santiago (6.8%). Turning to the number of beds, the best-equipped regions are Valparaíso, The Region of Lakes, the Urban Region of Santiago and Araucanía.

Table 14.4: Tourism accommodation facilities in Chilean regions

	Share of the region (%)		
	Tourism establishments	Beds	
Region	2001	1997	2001
Tarapaca	5.3	9.6	6.3
Antofagasta	5.2	5.0	5.5
Atacama	3.2	4.5	3.2
Coquimbo	6.7	7.0	7.5
Valparaiso	19.3	15.9	17.6
Urban Region of Santiago	6.8	22.0	14.3
Del Libertador General Bernardo O'Higgins	3.5	4.1	3.7
Del Maule	4.4	4.6	4.4
Del Biobio	6.2	8.2	6.6
Araucania	6.6	4.7	7.2
Los Lagos	20.3	10.8	16.7
Aisen del General Carlos Ibanez del Campo	6.7	1.5	3.2
Magallanes	5.8	2.1	3.9
Total Chile	100.0	100.0	100.0

Source: INE[57]

Tourism accommodation facilities have evolved at a different pace in Chilean Regions. Between 1997 and 2001, three regions experienced a rapid growth of number of beds, illustrating a rapid development of tourism activities: the Region of the Lakes, which accounted for 10.8% of beds in 1996 but 16.7% in 2001, Araucanía (4.7% in 1996 and 7.2% in 2001), and Valparaíso (15% in 1996 and 17.6% in 2001).

In 2001, 3 269 restaurants and food service establishments were registered in Chile. Once again, the majority of tourism infrastructure is located in the central part of Chile, 29.2% in the Region of Valparaíso, 15.6% in the Urban Region of Santiago, 13.8% in the Region of the Lakes, and 10.1% in the Araucanía.

The distribution of investment in the tourism sector also exhibits a concentrated pattern. The Urban Region of Santiago concentrates the major volume of tourism-related investment (54%). In other regions investments above US$ 10 million are situated in the Region of Valparaíso and in the Araucanía Region.

The projects related to tourist housing are mostly located in the Region of Coquimbo (56.2%). The Region of Valparaíso also presents numerous and

[57] INE, Anuario de Turismo 2001 and Anuario de Turismo 1997.

important projects of this type in development, concentrating 25.5% of the total amount. The Urban Region of Santiago registers a unique vast project.

Projects of second residence are mostly located in two regions: Valparaíso and The Araucanía, although those of greater importance are located in the former.

14.3.2 Existing Environmental Situation in Tourist Areas

The above description shows that tourism is concentrated in the central part of Chile. The regions that are likely to be most affected by any increase in tourism are the Urban Region of Santiago, Valparaiso and the Region of Lakes. We will also examine the Araucanía Region, both because tourism activities are important and also because this is the heartland of Mapuche people.

Concerning the environment, our point of departure is a study carried out by researchers of the Catholic University of Chile, which lists the main pre-existing environmental problems of these Chilean regions.[58] According to this study, these four regions experience severe environmental problems, some of which may be affected by growth in tourism.

In the **Urban Region of Santiago**, water pollution takes several forms: lack of water plants necessary for water ecosystem preservation, water contamination (industrial liquids, population use), lack of potable water in recent areas of urban expansion and in all rural areas. Atmospheric contamination mostly comes from industrial wastes, while traffic congestion enhances air pollution. The excessive extension of the city leads to agricultural soil losses and worsens the current situation of insufficient forestation.

The **Valparaíso Region** exhibits air and water contamination similar to the ones of the Santiago Region, with other specific forms of pollution. Mining activities, in particular, have contributed to water pollution. Industrial and domestic wastes biologically contaminate sea, beaches and rivers. All the coastal fauna species are in danger of extinction. Acid rain has been detected in several areas (Catemu, Valparaiso, Viña). The desertification process leads to a decrease of biodiversity. Fires have endangered flora.

The **Region of Lakes** suffers from water pollution (sea, rivers and lakes) generated by industrial, for example fuels and lubricants, and domestic wastes. The region is also characterised, according to the study, by an over-use of natural resources: over-fishing, over-use of the vegetation for consumption of firewood and hence destruction of native forests. The bad management of agricultural extraction activities and forestry causes soil erosion. The uncontrolled extension of cities threatens the regional ecosystem.

The Araucanía Region also faces several threats to environment. Water pollution of rivers and lakes is due to urban and industrial wastes. This problem is emphasised by an inefficient water provision system for human consumption, especially in rural areas. Excessive development of cities together with irrational use of wood accelerates the destruction of the native forest. This causes the destruction of the wild fauna habitat and causes species extinction. Furthermore, the whole region experiences soil erosion.

[58] HajekE. Ecología y Medio Ambiente en Chile, quoting Espinoza, G.; E. Hajek y P. Gross, 1994, Percepción de los Problemas Ambientales en las Regiones de Chile", published by CONAMA, http://www.hajek.cl/ecolyma/proamb00.htm.

14.3.3 Environmental and social repercussions of tourism growth

The development of tourism can have significant environmental and social repercussions.[59] Potential negative environmental impacts of tourism can include pollution of water and land, erosion, over-use of natural resources and extinction of fauna and flora species. Tourism can improve the social situation by generating new job opportunities, increasing the standard of living through generating additional revenues and reducing female unemployment, as tourism employs a high proportion of women.

Some tourist regions, notably Valparaiso and the Region of the Lakes already have sea and beach pollution. Development of beach and resort tourism may worsen these effects.

In general, beach and resort tourism may also be detrimental to coastal and marine flora and fauna. This could be a problem for Valparaíso and the Urban Region of Santiago.

The development of hotels and other tourism infrastructure contributes to urban expansion. This could potentially add to urban-related environmental degradation in the four above-mentioned regions. The possible negative consequences could include increasing solid and liquid wastes in fragile urban and peri-urban areas and endangering of coastal and forest fauna and flora.

The expansion of tourism may stimulate transport activities, and thus add to air pollution. This could have negative repercussions for the Urban Region of Santiago and the Valparaíso Region, where air contamination is already critical. This issue is examined in greater depth in section 14.2, Land Transport.

The development of tourism in fragile areas of natural beauty, if inefficiently managed, could enhance the deterioration of native forest and accelerate the extinction of fauna species. The Araucanía Region and the Region of the Lakes, already confronted with deforestation, should be aware of this potential problem.

From the social point of view, the expansion of tourism may mostly have positive repercussions, because it is expected to create new jobs and generate additional revenues for local population. Considering that tourism activities are expected to develop, it is reasonable to say that sector employment will increase. This may have a positive social impact, reducing gender inequalities, since tourism mostly employs women. This would be especially noteworthy if there are no barriers to promotion of women to higher posts.

A potential negative social consequence of the development of tourism concerns the Mapuche population. The Mapuches' traditional means of survival are closely related to native forests, and to a lesser extent to marine life. According to the 1992 population census, almost 20% of the Mapuche people continue to live in rural communities and thus have a

[59] Patricia P.A.A.H. Kandelaars, 1997, A Dynamic Simulation Model of Tourism and Environment in the Yucatán Peninsula, Interim Report, International Institute for Applied Systems Analysis Document, IR-97-18/April.

traditional lifestyle60. This part of the Mapuche population is thus highly vulnerable to the destruction of native forests and the loss traditional means of survival (animals they hunt, the plants they gather for food and medicine).

If the development of tourism activities in the Araucanía Region contributes to deforestation and loss of biodiversity (forest and marine fauna and flora), it may be detrimental to the Mapuche population. Araucanía is known for its natural parks and forests: in 2001, the region totaled 529 555 visits in protected forest areas (parks), which represents more one half of the whole country visits. This situation calls for a careful management of tourism in this region.

Table 14.5: Summary of sustainability impacts for the tourism sector

	Dimensions / Significance Criteria				
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity: Gender C	Revers-ibility D	Capacity to change E
I Economic					
1. Real income	△				
2. Net fixed capital formation	?				
3. Employment	△		△		
4. Consumer effects	?				
II Social					
5. Poverty	○				
6. Health and education	▽				
III Environmental					
7. Environmental quality	▽	▼			△
8. Biological diversity	▽	▼			△
9. Other natural resource stocks	?				

For explanation of symbols, rows and columns, see Section 5 or Section 19.

[60] Aylwin J., 1998, Indigenous Peoples Rights In Chile: Progresses And Contradictions In A Context Of Economic Globalization, Paper presented at the Canadian Association for Latin American and Caribbean Studies, XXVIII Congress, Simon Fraser University, Vancouver, B.C., March 19-21, 1998.

15. Sector study: Services, Foreign Direct Investment and Intellectual Property

15.1 Summary

This service sector study is to supplement the GTAP econometric assessment of the impact of the proposed Economic Partnership Agreement between the EU and Chile on the services sectors in Chile. It assesses the service sector in Chile and compares the EU-Chile FTA model estimates with those of Michigan University for various FTAs in the Western Hemisphere, those of the Australian Productivity Commission which focused on reducing barriers to trade in services by adding FDI data to the GTAP model, and a study by the International Trade Division of the Chilean Ministry of Foreign Affairs for the Chile-Japan FTA. Conclusions are drawn from this comparison. The likely path of service sector evolution in Chile is then described by reference to sector trends in more advanced economies, on a qualitative, not a statistical basis. The study concludes with estimates for changes in the EU-Chile trade and FDI in services flows, the transfer of IPR, and the likely impact of these changes on the Chilean economy.

15.2 Purpose of the service sector study

The scope of the services chapter of the Agreement covers most privately supplied services and provides for extensive liberalisation of both trade and investment in services, and negotiations on the movement of natural persons[61], taking account of the structure and principles of the World Trade Organisation and General Agreement on Trade in Services (GATS).

Not only the effects of the proposed EU-Chile Agreement on liberalisation of services have to be considered, but also the effects of any recent unilateral liberalisation made by Chile, and those arising from the actual and prospective trade agreements Chile is involved with in the Western Hemisphere.

It is assumed that in the EU, with the exception of public procurement, no further liberalisation will be made solely due to the FTA with Chile, and that the single market is already substantially open for Chilean services suppliers, while that for financial services is being made more open under the Financial Services Action Plan.

There are not only the effects to consider on services cross-border trade between Chile and the EU, and the flows of FDI in each direction, but also the effect that trade liberalisation may have on other sectors in Chile due to inter-sectoral linkages. There may be added effects to consider on the service sectors of goods liberalisation, especially the effects of the WTO Information Technology Agreement, though these are likely bigger on the import of computer and similar equipment and software from the US and Asia than from the EU.

As this section examines only economic issues, the sustainability assessment at the end of the section covers only these issues. Transport environmental issues were examined in Section 14 above.

[61] GATS 'Mode 4'- Article I.2 (d).

15.3 Brief overview of the service sector and its setting in the economy

15.3.1 IMF and World Bank indicators and Chilean data on services

The overview of the Chilean economy in Section 8 showed that economic progress and management have been remarkable in recent years. Indeed when the sectoral output of services is considered, the economy already has some features of an advanced Western services economy. The factors quoted below from IMF sources will contribute to the sound evolution of the service sector in ways that can be deduced from the experience of economies with higher GDP per head.

The majority of the population lives in towns (86% in 2000). Some 40% of the population live in the Santiago metropolitan region, the density there being 402 persons per sq. km. A further 23% live in the Biobio and Valparaiso regions, where the densities are only 53 and 96 respectively[62]. A high proportion of economic activity is located in these centres, which favours the growth of higher value-added services.

IMF figures[63] show that services output accounted for over 65% of GDP - this includes construction and government services. 'Commerce' at 16.8% of GDP was significantly higher than either manufacturing (14.5%) or agriculture, forestry and fishing (7.6). Financial services at 13.6% came next, followed by Transport, storage and communications (9.3%), and construction (4.5%). Other services, at 21.1% included both government services and various GDP adjustments[64]. Mining (at 10.1%) and utilities (2.6%) made up the balance.

Almost 70% of the employed workforce in 2000 were in the service sector (including construction)[65]. This accounted for 63% of all working males and 84% of females. Women account for 40% of the employed workforce in services compared with 30% for all sectors combined. Only 2% of construction workers are female, and 14% in Transport, storage and communications, whereas in Wholesale and Retail Trade and Restaurants the figure is 45% and in Community, Social and Personal Services 55%. This compares with 11% in agriculture and 27% in manufacturing.

World Bank indicators show that in 1998 public expenditure on education was 3.6% of GDP and 3.9% on health. In 2000, 96% of those aged 15 and over were literate, and the average life expectancy at birth was 76 years.

The number of PCs per 1000 persons in 1998 was 48, higher than 47 in South Africa, 44 in Argentina, and 30 in Brazil. That year mobile phones per 1000 were 65, which compared with 78 in Argentina, 47 in Brazil and 32 in Thailand. Probably all these levels have expanded considerably since.

Chile has a larger merchant fleet (916dwt in 1998) than Argentina (630dwt), and South Africa (369dwt), but far smaller than Thailand (3,156dwt).

The securities market capitalisation in 1999 was $68 billion, exceeding those of Indonesia ($64bn), Philippines ($48bn) and Thailand ($58bn)[66].

[62] For comparison, in Belgium and the Netherlands the densities were 311 and 463 respectively in 1998.

[63] Chile: Selected Issues, IMF Country Report No. 01/120

[64] It also includes "imputed banking charges, import duties, and value-added tax on imports."

[65] Figures for the 4th quarter of 2000 = 69.7%, and for February to April 2002 = 70.2%.

[66] The figure for Portugal is $ 63 billion.

The IMF report shows that although about 60% of total trade in 2000 was with the EU, US, Japan and Argentina, the export pattern is markedly different from that for imports. This is mainly due to the imbalances with Japan and Argentina. Chile exports far more to Japan than it imports, and vice versa for Argentina. Separate figures were not given for the services BOP figures.

Table 15.1: Chile Trade Partners

%	Exports	Imports
EU	25	17
US	17	20
Japan	14	4
Argentina	4	17
TOTALS	60	58

Chilean official data show that services trade has been in deficit for the past decade (apart from a tiny surplus in 1997), but due to strong goods exports the trade balance was positive for the three years to 2000. Chile invests virtually all of its outward FDI in Latin America, and in the first nine months of 2001 30% of this went into services, nearly equalling the 38% to manufacturing.

Data from the EU[67] indicate that it is likely the EU ran a small surplus with Chile on the services BOP account in 1999, and a much larger one in 2000, when the four major earners were Germany, Great Britain, Italy and Spain, with Great Britain, Germany and Spain achieving significant surpluses. Four or five other Member States ran small deficits with Chile in 2000.

Trade per head of population is high for a developing country, and the services portion (or services intensity) is above that of most developing countries, and is at the trend line for the advanced economies.

Chilean data on FDI show the following picture for inward investment in four broad sectors:

Table 15.2: Foreign Direct Investment in Chile for major sectors

$ million	1998	1999	2000	2001
Utilities	495	4,560	860	908
Construction	290	215	29	166
Transport and communications	211	359	870	1,284
Services	2,005	1,910	665	705

The top four investing countries in 2000 were Spain, USA, Canada and the UK in that order, and in 2001: USA, Italy, Spain and the UK.

Section 15.3.4 has more detailed data on inward FDI, but on a different basis.

15.3.2 WTO Trade Report of 1999

[67] Unpublished data but incorporated into 'EU International Transactions', Eurostat, 2002

A WTO report based mainly on IMF data showed that in 1998 nearly 70% of Chilean exports of services were for Transport and Travel (US$ 1,614 million and $1,158m respectively out of a total of $4,030m). Other business services ($837m) accounted for almost two-thirds of the remainder, with communications next ($192m), followed by insurance ($138m) and royalties and licence fees ($91m).

Out of a total of $4,077m imports of services that year, some 76% was accounted for by transport and travel, and this was followed by Other business services ($611m - i.e. 15%), communications ($175m), insurance ($120) and royalties and licences ($56).

On the face of it these figures show that Chile has a comparative advantage in travel (i.e. tourism) with a surplus of $215m, Other business services - surplus of $225m, Royalties and licences - where the surplus was $35m, and insurance - surplus of $18m. The surplus of $17m on communications may be due to an artificial telecoms accounting settlement rates 'subsidy' to the Chilean network operators, which will presumably be markedly reduced within a few years.

As no separate figures were shown for either exports or imports of construction, financial services and computer and information services, it could be that the Other business services was swollen by including figures for those sectors, and in some of them Chile could be expected also to have a comparative advantage.

An official UK government publication rated the potential for services exports by UK suppliers to Chile to be especially strong in the telecoms and environmental services sectors, while priority attention should be given to construction, education, energy, engineering, financial services and transport[68].

15.3.3 WTO Trade Policy Review Mechanism summary of 1997

The picture of the small Chilean economy which emerged from the earlier WTO TPRM (Trade Policy Review Mechanism) summary of late 1997 reveals a textbook regime based on the aim of equitable social development promoted through private enterprise and investment, and multilaterally opened up trade, a sound macro-regulatory structure, an independent central bank and a balanced fiscal stance. The high private savings rate of over 25% of GDP contributes to growth and liquid securities markets through permitted investment by pension funds in low risk stocks. As a founder Member of the GATT and WTO, stress is laid on the importance of a multilateral framework of rules and the removal of MFN (Most Favoured Nation) Exemptions under the GATS, especially important for Chile, which is a member of various bilateral and multilateral trade agreements.

The service sector output was already well over 50% of GDP and growing, and virtually all state-owned suppliers had been privatised, or concessions granted for their operation. Banking supervision applies the Basel capital adequacy standards for solvency and stability, and there is an independent competition authority and new laws for the protection of intellectual property rights. Foreign investment had been welcomed with unrestricted market access and accorded national treatment, and in 1991-96 29% of FDI went into the service sector, principally into tourism and telecoms. Private provision of some health services was sought. Most of Chilean outward FDI stayed within the region, and principally goes to the financial and other services sectors.

[68] 'British Trade International - Markets and Sectors Matrix', DTI, March 1999.

The telecoms sector was fully privatised, and the seaports were mostly in private hands. Private management was established for the administration of some roads, the airports and railways.

In the period 1991-96 non-financial services exports were about 24% of goods, i.e. higher than the world average - the principal sub-sectors being tourism, port services, freight and insurance. Chile participated fully in the GATS deliberations and negotiations on maritime, financial and professional services.

Overall some 50% of Chilean exports went to APEC countries, and 25% to the EU. At that time a small surplus was run with the EU - but the services proportion was not shown. The UK and Germany were then the principal trading partners in the EU. The proportion of trade with Latin America and other APEC partners was expected to grow, and probably the EU proportion therefore to fall.

15.3.4 Study by the Chilean government for the Chile-Japan FTA

The 1999 study by Direcon[69] on the Chile-Japan FTA concluded that it would be highly beneficial to bilateral trade, and the hope was that it would encourage FDI into Chile, especially any related to information technology, and help to offset any trade diversion due to Chile's FTAs with the US and EU.

Japanese FDI has been almost non-existent in the Chilean service sector, despite the evident Japanese competitive advantage in financial services, telecoms and ICT[70], whilst benefit could also be obtained from FDI in air transport, research and development, health and education by Japanese suppliers, and from work on an agreement for the movement of natural persons.

Recent FDI into the Chilean service sectors was as follows:

Table 15.3: Inward FDI, percentages of country totals in each service sector:

	1997	1998	1999
Construction	2	5	2
Distribution	5	3	1
Transport and storage	1	2	..
Communications	2	1	8
Financial services	15	24	12
Real estate	1	1	..
Other services	3	6	6
Totals	**28**	**41**	**31**

('..' < 0.5%)

The Direcon study on the Chilean service sector, forming a reference background, stressed the importance of improving the competitiveness of Chilean services, through professional and capacity upgrading for the use of higher technologies so as to cope with structural adjustments in the whole economy due to the various FTAs. It was foreseen that the transfer of

[69] The Directorate General of International Trade Relations in the Ministry of Foreign Affairs.

[70] Information and Communication Technology

technology and knowledge, possibly through joint ventures, would also increase their export competitiveness.

The most profitable sectors were telecoms, financial services, distribution, and transport.

Chilean exporting strengths were identified as professional and business services (taxation, bookkeeping, accounting, auditing and legal services, ICT related services, and management consultancy), social and health services, training, banking and insurance, distribution, hotels and restaurants. These exports were mainly to developing country markets in Latin America, but not to Asia, and little to any advanced economies.

Exports in the transport sector had grown at an average rate of 6.7% in the period 1996-1999, and accounted for almost 40% of total services exports. Tourism accounted for a further 28% in 1999, 'imports' being 23%.

US and EU multinational firms were present in the following sectors: hotel and restaurant chains, vehicle rentals, tourist operators and agents, telecoms, insurance, advertising, accounting, manpower agencies, construction, computer services, trading, express couriers, auxiliary air services, wholesale, films and videos, petrol filling stations, cinemas, and supermarkets. There were virtually no Japanese or Asian counterparts present.

Chile was introducing new laws on the protection of intellectual property rights in line with the TRIPS Agreement, and co-operation between the authorities on combating piracy was envisioned.

15.3.5 Position of the Santiago Chamber of Commerce on the EU-Chile FTA

The Chamber noted that although in 1998 the GDP of Chile was 4% of that of Latin America, its trade was over 9% of that between the EU and Latin America.

In the period 1974-1999, 35% of inward FDI came from the EU[71], and 65% of this was in services, particularly financial services, telecoms and construction - and this figure also included the utilities. Major EU firms stand out in the telecoms, distribution, financial services and waste management sectors.

Chilean exporters are as yet unable to take advantage of openings for the commercial presence mode of supply in the EU and US, or to contest such highly competitive markets. Chilean exports to the EU would likely be concentrated on repairs to ships, containers and aircraft, and their maintenance, various services allied to agricultural exports to the EU (such as quality inspection) and professional and business services to EU firms established in Chile, where knowledge of market conditions in Mexico, Central America and the Mercosur could be of value. A wide range of logistical and associated services linked to goods forms 50-60% of the value of Chilean goods exports - transport accounting for about 20% of the trade export transaction value in most markets. There are no barriers in Chile to multi-modal transport.

Chile offers the most stable and transparent political and economic regime in the region, and also the best capital market and advanced telecoms networks with low charging rates. In addition the labour force is the most productive

[71] The USA and Canada together accounted for 46%, Japan 3% and Australia / New Zealand 3%.

and efficient. Joint ventures would offer EU firms increased economies of scale and thus competitiveness.

The FTAs with the US and EU were more important to Chile than the WTO and the FTAA, given the size of the service sector in the US and EU and their services trade.

The Chamber is urging the government to evolve policies to encourage complementarity between Chile and the EU on multi-modal transport and a cluster of tourist services.

15.4 Results of the study GTAP modelling scenario, compared with others

15.4.1 GTAP

The GTAP modelling exercise (see sections 8, 9 and 23) is based on SNA data (classified by activity - ISIC), adds BOP data (classified by product - CPC), and FDI data (for activities also classified by ISIC categories). The GTAP scenario for the present study calculates results for four market services groupings of activities, and does not identify government and other non-market activities. The four service groupings are: Construction, Trade / transport / communications, Business services and Other services.

In broad terms the model shows that the EU-Chile FTA would result for Chile in an increase of 0.5% of GDP or US$ 293 million, and that exports would increase by 3.2 % (US$ 657 million), capital stock by 1.2% and real income by 0.4%.

The four service sectors, which together were shown as accounting for 57.4 % of output value, would gain by the following increases: Wholesale, retail, restaurants, hotels, transport, and other communications services: 0.19%, Construction: 1.10%, Business services: 0.48% and Other services: 0.36%.

As for exports, services in the model start with a 15.14% share and a 1997 value of US $ 2 848, and all are estimated to shrink between 2 and 4%. The $ 2,959 value of imports, representing 12.73% of all imports, would also all shrink though only between 1 and 1.5% - apart from Wholesale, retail, restaurants, hotels, transport, and other communications services, which would increase by 0.23%. In the latter there would be a decrease in labour (of 1.28% for unskilled and 0.68% for skilled), and there would be marginal changes in the other three sectors, a gain in construction and decreases in the other two. Household consumption of these services (excluding construction) would increase within the range 0.15-0.33% and the prices would drop within the range 0.08-0.40%.

15.4.2 Michigan Model

A comparison can be made with estimates computed in other CGE models which feature Chile and the EU. They are described in Section 24.

Given the similar proportions of trade between Chile and the EU and US, the EU-Chile outturn of +0.5% of GDP appears broadly consistent with the Michigan Model outturn of +0.6% of GDP for the Chile-USA bilateral FTA. However, the dollar figures are not consistent i.e. 0.5% = $ 293 million, and 0.6% = $ 479 million. The Michigan Model estimated that a one-third reduction in all services barriers would increase GDP of Chile by 1.17% or $ 800 million. If services exports are about 15% of total exports then 100%

reduction on the 25% of this going to the EU would equate with $ 360 million which is not significantly different from the $ 293 million figure.

It is assumed that the Michigan Model combined the effects of the various Western Hemisphere scenarios so as to take account of their interaction. The EU-Chile model presumably did not take account of these FTAs, (see Section 8) and therefore some adjustment has to be made, as the positive gains from all the FTAs cannot be additive.

15.4.3 FTAP

The FTAP model of the Australian Productivity Commission (APC) (see Section 24) calculated that if existing barriers to all types of trade were removed, the GDP in the tertiary sector of Chile would increase by $ 330 million, which implies a figure of $ 110 million if only a 33% reduction of services barriers were to be implemented as modelled by Michigan. Given that the APC model has a more developed basis for estimating services barriers than the Michigan model, and presumably also better than the EU-Chile model, it could be the EU-Chile figure of $293m is on this high side, rather than a minimum. On the other hand, the FTAP assumptions on FDI in the service sector may not yet be entirely reliable.

Taking barriers to trade as tax equivalents, Chile is estimated to be suffering from a 4.4% 'tax' on cross-border services exports, a 3.0% tax on all services outputs, 14.2% tax on capital employed in services production, while foreign affiliates suffer from 4.1% on output and 20.4% on capital employed, the higher figures incorporating the additional 'cost' of national treatment discrimination. The figures for the EU are 4.7, 0.1, 1.3, 1.3 and 6.5 % respectively.

Projected over a notional ten year period on a static analysis basis, Chile could be expected to gain a 0.4% increase in GDP from the complete removal of all the services barriers, and a 0.3% increase in real net national income - or US$ 330 million. By contrast the EU, as a major world investor, would suffer a loss as its FDI ceased to earn rents from protected markets abroad. In Chile the capital stock in services would increase by US$ 202 million despite a drop in FDI stock of $ 39 million.

In the FTAP2 model[72] the tax equivalent of barriers to international telephone calls is only 1.3% and 1% on capital, reflecting a nearly liberal regime, and complete opening would only give rise to an increase in GNP of 0.01% over the ten years.

The FTAP2 model estimates that Chile stands to gain little from full liberalisation of its telecoms sector, since it is already largely liberalised. The benefit from complete liberalisation of financial services would be much greater due to positive allocative effects and net capital endowment growth.

15.5 Sector Results

The likely evolutionary path of the Chilean service sectors can be described by reference to sector trends in more advanced economies. The EU services sector comparative advantages shape the following comments on likely EU future FDI in Chilean service sectors.

15.5.1 Trade in services, and FDI flows - by sectors

[72] Hanslow, K., Phamduc, T. and Verikios, G, *The Structure of the FTAP Model*, Australian Productivity Commission, 2000

The likely evolution of the Chilean service sectors and the effects of the EU-Chile FTA on the sectors are given a brief overview here.

A. Wholesale, retail, restaurants, hotels, transport, and other communications services:

Wholesale distribution: will reflect the growth of GDP per head, and is likely to be a target sector for EU FDI and related advisory services.

Retail distribution: will not be generally affected as small family units predominate, but some EU major retailers are likely to position themselves in the bigger cities.

Both distribution sectors will reflect changes in goods imports. EU goods exporters are likely to face fierce competition from their counterparts in the Western Hemisphere.

Maritime transport: The split between earnings from the Chilean owned fleet and port services is not identified. It seems likely that growth will reflect the pattern of merchandise trade[73].

Air transport: Growth will predominantly reflect passenger traffic and thus tourism to a large extent. The EU-Chile FTA will exclude most air transport services, and will not disturb the ICAO (International Civil Aviation Organization) bilateral agreements on hard rights.

Rail and road transport: will not be directly affected by the EU-Chile FTA, though it is possible that some EU FDI may go to this sector.

Postal services: will not be affected by the EU-Chile FTA as the post office is owned by the state.

Express carriers: Growth in local firms operating within Chile or across the borders to immediate neighbours can be expected to grow faster than the economy on average. Of the four global carriers, TNT is owned and headquartered in the Netherlands; DHL is majority owned by German interests though is still headquartered in the US, while Federal Express and UPS are US companies. Because the business is globally competitive, the EU-owned companies are not expected to gain a competitive advantage as a consequence of the EU-Chile trade agreement. DHL and UPS are the largest of these companies in Latin America. DHL operates Latin American hubs in Panama, Argentina and Miami, Florida, USA. UPS and Federal Express have their regional hubs in Miami. TNT's regional hubs are based in Santiago de Chile and Miami. The development of regional hubs depends on economic growth in each country, location and costs. Thus, the EU-Chile trade agreement is expected to expand the use of express carriers but this expansion will not in itself be decisive to decisions concerning regional hub development[74].

Telecommunications: will grow faster than the economy as a whole, but will be little impacted by the EU-Chile FTA as the sector is almost fully liberalised. Further EU FDI is likely to flow into this sector.

B. Construction

[73] Presumably there is additionally extensive maritime cabotage traffic due to the long coastline, but this will be excluded from the EU-Chile FTA.

[74] Express Carriers Capitalize On Region's Economic Recovery, Journal of Commerce Newspaper, 22/02/2000, www.joc.com

The proportion of construction in GDP is average, but no indicators of its relative strength were identified. Its growth is closely tied to investment in the built infrastructure, manufacturing and commercial property, and housing. Any EU contractors entering the market would likely face strong competition from Brazilian firms that have a well developed comparative advantage.

C. Business Services

Banking services and securities markets: These sectors appear to be relatively well developed and are likely to show strong growth, and perhaps be a regional resource for immediate neighbours. There will likely be further inward FDI from major EU financial institutions, including for the provision of financial information.

Insurance services: Premium penetration at $162 per head in 1998[75] was high for a developing country, though lower than in Argentina ($172)[76]. Insurance tends to grow at about twice the rate of the GDP increase, and given this good start, that looks likely in Chile.

Computer services: It is likely that the Chileans have a comparative advantage in this sector, and it will show above average growth, possibly aided through investment by Chileans returning home, having in earlier years been part of the brain drain to the US and Europe. The Chilean authorities have had enlightened policies on computing and technology services. The EU-Chile FTA may spur use by EU firms of Chilean computer services.

Professional services: The main issue for the regulated 'liberal' professions is the creation of mutual recognition agreements which are expensive and time consuming. It is unlikely that much progress will be made on this front, despite the EU-Chile FTA, as there have been no significant advances in the Western Hemisphere FTAs, and none even under NAFTA.

Energy and environmental services: These are mainly specialised professional engineering and associated business services, and there is likely to be a growing demand, mainly from government procurement, which EU suppliers should be well placed to meet.

Other business services: As the economy expands and GDP per head rises, the less regulated professions and unregulated business services will grow faster than GDP, and form a vital input to productive processes, affecting competitiveness throughout the economy[77]. Many EU suppliers have a competitive advantage in these services and are well placed to gain a share of the market through subsidiaries or joint ventures, despite strong competition from US and Canadian firms.

D. Other Services

Health and education services: The markets for these services are likely to be small for some time to come, and will be subject to strict regulation and supervision by the authorities. EU suppliers will face

[75] Swiss Re, Sigma 7/99

[76] For comparison: Mexico $63, Turkey $33, Brazil $103, Malaysia $133 and Thailand $42.

[77] Examples are engineering and quantity surveying, R&D, real estate, advertising, PR, market research, management consultancy, technical testing and analysis, security and publishing.

strong competition from Western Hemisphere providers, especially those from the USA.

Tourism, recreational and cultural services: Chile should continue to benefit strongly from tourism, and this will positively affect various recreational and cultural services. The EU-Chile FTA could stimulate EU FDI in hotels and restaurants. Other direct effects of the FTA are not likely to be large, as the sector is driven by global consumer demand, and there are no real barriers to EU tourists visiting Chile - other than high airfares due to ICAO treaties, which will be left untouched. There may be some indirect positive benefits through sectors that support tourism, such as financial services.

15.5.2 Foreign Direct Investment FDI - general considerations

Foreign Direct Investment (FDI) is generally affected by the business and stock market cycles, as well as by business confidence in political stability and government economic management. Characteristically FDI does not flow steadily as it is the outcome of discrete investment decisions by individual enterprises with no set frequencies. These changes in company-level business strategies cannot readily be predicted from aggregate data, while in the Chilean context a single decision can form a large proportion of total FDI. The path of aggregate FDI, even over the medium term, is therefore 'lumpy' and unpredictable: at best only general trends can be projected.

The EU-Chile trade agreement is expected to have a positive effect on FDI in both the Chilean domestic economy as a whole and on Chilean non-services exports. The effects of economic growth and increased efficiency are therefore expected to outweigh any loss to future foreign investment from decreased monopoly profits.

As outlined in section 15.5.1 above, most services sectors of the Chilean economy can be expected to have an increase as a consequence of the EU-Chile agreement. In some cases, the FDI is not expected to come primarily from EU firms. The main target sectors for EU-based FDI into Chile are expected to be as follows:

- Wholesale & retail distribution
- Express carriers
- Telecommunications
- Banking services and securities markets
- Insurance services
- Computer services
- Other business services
- Energy and environmental services
- Travel / Tourism

Concerning Maritime transport, insufficient information is available to project whether an increase in EU-based FDI will result.

In addition, increased FDI is also expected to occur in the following services sectors, where the primary investment in Chile is not expected to come from EU-based companies:

- Construction
- Health and Education services

Production (primary and manufacturing) sectors that can be identified as likely to attract FDI include:

- Mining / non-ferrous metals
- Fisheries
- Processed foods / beverages
- Chemicals

In the case of mining and fisheries, the expected increase in FDI comes directly from the opening of these sectors to foreign ownership by qualifying EU-owned companies. In the case of processed foods / beverages, the additional FDI is likely to be derived from the sector's growth and the observation that the expected destination of much of the sector's exports is the EU. In the Chemicals sector, growth and the increased integration into the international division of activities is the motivating factor.

It is also possible that, to a much lesser extent, the EU-Chile trade agreement could bring about a limited increase in FDI in sectors that are not expected to grow as a consequence of the agreement but are expected to become more internationally integrated. Such sectors include refineries and possibly steel, motor vehicles and electronics.

15.5.3 Intellectual property rights (IPR)

The split of export earnings between patents on goods products and copyrights and other rights on services is not published. The number of such rights awarded in 2000 by the Chilean authorities was divided almost equally between patents and copyrights, but this may not indicate their commercial value, especially in cross-border trade.

The surplus earned by Chile in 1998 on the Royalties and licences part of the BOP current account noted above might be misleading, as the International Intellectual Property Alliance (IIPA) calculates[78] that in 2001 there were almost $ 9 billion of losses from copyright piracy on films, music and software world-wide, and the Chilean portion of this was $ 50 million.

The IIPA reported recently that copyright piracy in Chile had been increasing dramatically and constitutes a serious problem. The FTAs with the US and EU look set to address this situation, though it will take time for the effects to be seen. At present there is little political focus on it and enforcement resources are inadequate - both in police action, convictions and in deterrent sentencing by the courts. The legal implementation of the TRIPs Agreement is still inadequate in a number of important respects.

Pirated CDs are made in Chile as well as imported and are readily available on streets and at week-end markets, and there is no police action on Saturday afternoons and on Sundays when most of the trade is done. There has been a widespread fall in legal shop sales and this has resulted in many shop closures. The piracy losses on music CDs alone are about $ 12 million.

Video piracy is also a major concern involving DVDs. Video games are contained in the memories and cartridges of illegally imported games consoles, often coming from Hong Kong.

Book publishing is hit hard because of the high VAT rate, which can be avoided by buying pirated copies.

[78] See IIPA website (www.iipa.com)

About half the market for business software is illegal, producing losses of some $ 35 million in 2001.

Even if the income from Royalties and licences earned by Chilean performers and software writers increases, as seems likely, one has to conclude that the terms of trade on this BOP account will turn against Chile as they update their IPR laws and carry out effective enforcement. The speed of this turn-around is difficult to predict, but is likely to take some years.

15.6 Sector Conclusions

15.6.1 General observations

The EU-Chile GTAP gravity model produces results for the Chilean service sector GDP growth that, due to the methodological assumptions, are likely to be swamped by actual growth rates. Indeed it does seem likely on general qualitative grounds that such growth will comfortably exceed the levels resulting from the FTA. This is the case especially in the sector of Other Services, where also the skilled labour is likely to expand rather than contract.

Similarly the model results for Chilean services exports will not be apparent, as exports are likely to grow rather than contract, even if not to a marked degree, given that they depend on neighbouring developing country markets, rather than new footholds in any advanced economies.

In certain sectors, as indicated above, EU suppliers may see potential and derive benefit from those Chilean services markets, but the overall effect on total EU trade in services is likely to be proportionately small.

It seems unlikely that many Chilean services exporters will make significant inroads into the EU services markets through commercial presence for some time to come, apart perhaps from in one or two specialist niches. They stand to benefit, however, from increased EU activity in their own and neighbouring markets, and from the choice of Chile as a good jumping-off point for activities in Latin America.

15.6.2 Conclusions

Having reviewed the economic evidence for the sector, it appears that service sector growth and thus employment could be somewhat higher than projected by GTAP, with factors other than tariff reductions being the driving force.

The potential social and environmental consequences of this projected economic development are examined in the scoping exercise at section 10.15, *Social and Environmental consequences of expected developments in services and FDI*.

The potential environmental impacts of urban-area economic growth, a consequence of both general economic development and specifically of urban-based services growth, are examined in section 14, *Sector Studies Land Transport and Electricity*.

Table 15.4: Summary of economic sustainability impacts for the services sector

	Dimensions / Significance Criteria				
Themes:	**Overall Direction magnitude** **A**	Existing conditions B	Equity C	Revers-ibility D	Capacity to change E
I Economic					
1. Real income	△				
2. Net fixed capital formation	△				
3. Employment	**?**				
4. Consumer effects	△				

For explanation of symbols, rows and columns, see Section 5 or Section 19.

16. Analysis of impact on the EU

16.1 Introduction

An important issue is the likely impact of the EU-Chile trade agreement on the EU. Chile is not a major EU partner; in 2000 Chile ranked 40th for EU exports and 38th for EU imports. In confirmation of this, the GTAP simulations of the trade agreement, detailed in Section 9, showed that the impact of the trade agreement on the EU, as a whole, is expected to be minor[79]. However, the analysis has to go further and evaluate how the EU Member States will be individually affected by the trade agreement. This is the purpose of this Section which will focus on trade in goods, since the issue of services is treated separately (Section 15).

16.2 Methodology

Section 16 aims at estimating the impact of the EU-Chile trade agreement on sector trade of the 15 EU Member States with the world. Our point of departure is the GTAP simulations (Section 9), which give the projected long-run change in EU sector trade *with the whole world* as a consequence of the EU-Chile Trade agreement. According to these simulations, the EU-Chile agreement will affect EU sector exports and imports in different ways. The results of these simulations are presented in Table 16.2, which gives the percentage change of EU trade with the world by sector.

On this basis, we use a three-stage methodology to estimate the impact of the EU-Chile trade agreement on the sector trade of each Member State *with the whole world* (see Figure 16.1).

- In the first stage, we calculate the change in value of EU total sectoral exports and imports. This is obtained by multiplying the percentage evolution of exports and imports in each sector (given by GTAP simulations) by the corresponding 2001 value of EU total sectoral exports and imports.
- The second stage aims at estimating the change in the value of sectoral exports and imports of each Member State. To calculate these values, we multiply the evolution in value of EU total sectoral trade (obtained in the first stage) by the 2001 share of each Member State in EU total sectoral trade. This gives us, for each Member State, the projected evolution of trade (exports and imports) with the whole world, in each of the 22 sectors considered.
- In the third stage, we estimate the change in value of sectoral commercial balances. These values are obtained by subtracting the evolution of sectoral imports to the evolution of sectoral exports. Studying the evolution of commercial balances enables us to determine which countries are likely to be the most affected by the EU-Chile agreement. We examine for which Member States, the sectors for which the commercial balance is likely to improve, and those for which it may deteriorate.

One has to be cautious when interpreting these results:

- An increase in exports means either that the country extends its foreign market, or that prices of exports increase. In the first case, this may be welfare enhancing because augmentation of exports may result in an

[79] Projected impacts on macroeconomic indicators are often less than 0.01%.

increase in output, possibly leading to job creation. In the second case, the profits of exporters increase, leading to an improvement of global welfare. Another possibility is that products are devoted only to exports, then diminishing domestic consumption. This situation, where increasing exports reduce welfare, may happen in low developed countries but is not likely to occur in EU countries.

- The effect of an increase in imports on welfare is more ambiguous. On the one hand, consumer welfare increases because the number of varieties of products available for consumption increases. If the increase in imports relies on falling prices of imported goods, the consumer surplus enlarges. On the other, if imports are a substitute to domestic products, this will have negative repercussions on production and employment.
- Arriving at conclusions on the welfare effect at global and sector levels would require additional information related to the structure of the productive system, to employment, to productivity, etc. Carrying out such an in-depth analysis is not our purpose here. In this study, we will focus on the implications of the EU-Chile trade agreement on Member States' commercial balances. This enables us to carry out two assessments:
  - We first determine the impact that the EU-Chile trade agreement is likely to have on the sectoral commercial balances of each Member State. An increase in the commercial balance in a given sector illustrates a reinforcement of the sectoral competitive advantage or a reduction of the competitive disadvantage. A reduction of the commercial balance means that the competitive advantage is reduced or that the competitive disadvantage worsens.
  - Second, we determine whether if Member States are likely to undergo a significant reduction of exports, possibly implying a welfare reduction through a decrease in production and job losses.

Our methodology can only give estimations of the possible country/sector impacts that the EU-Chile trade agreement may have in the EU. The reason is that the methodology we use relies on two assumptions:

- First, we assume that each individual country's exports and imports will vary in the same direction (increase or decrease) as EU exports and imports.
- Second, our methodology is based on GTAP simulations, which give the long-term change in EU total sector exports and imports. To evaluate the impact on Member States' sectoral exports and imports, we need the share of each country in EU total sectoral trade. For our calculations, we use the 2001 share of each country in EU exports and imports. We then assume that the share of each country in EU sectoral trade will remain the same in the long run.

The calculations presented in this Section are probable effects, considering that the shares mentioned above would remain unchanged. Calculations thus should be considered as a basis for a qualitative more than a quantitative assessment of the EU-Chile agreement impact.

Figure 16.1: Methodology overview

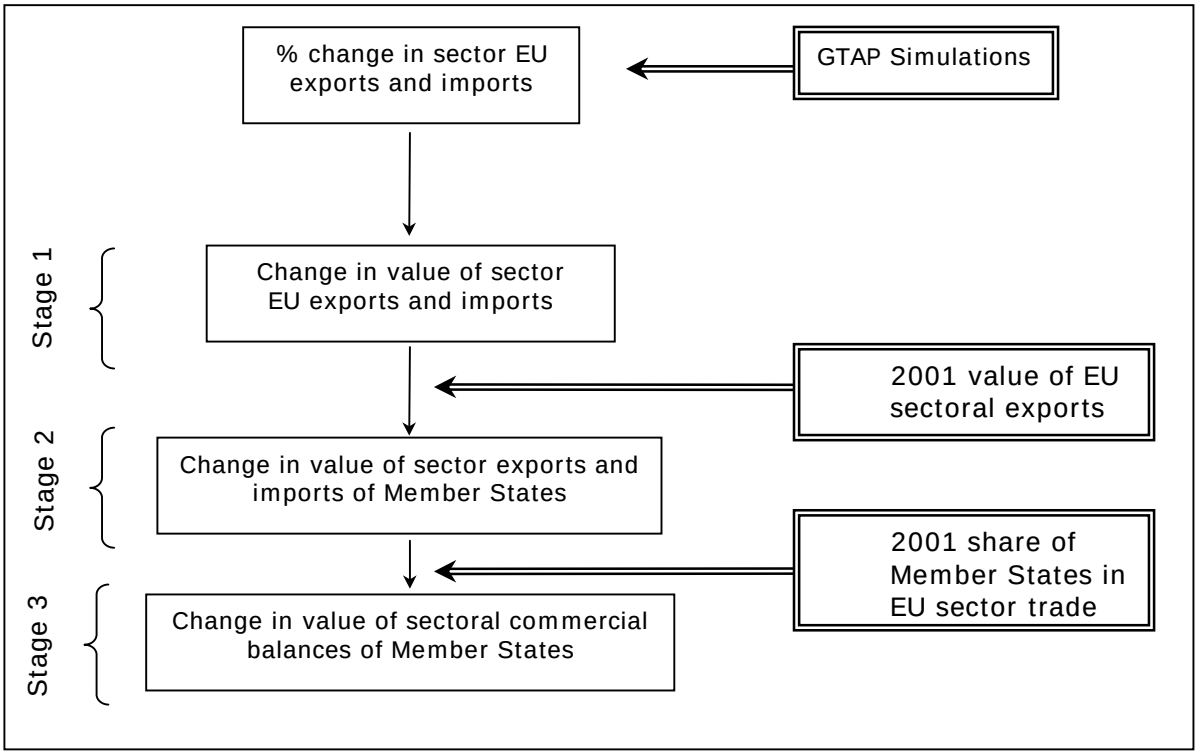


Table 16.1: GTAP projected change in EU sector trade (%)

Sector	% change in EU exports	% change in EU imports
Grains	-0.2	-0.02
Other Agriculture	-0.2	0.06
Cattle	0.0	-0.02
Dairy	0.0	0.00
Meats	-0.1	0.07
Fisheries	0.0	0.00
Forestry	0.0	0.01
Processed Foods	-0.2	0.16
Beverages	-0.1	0.09
Mining	0.1	0.02
Non-Ferrous	-0.1	0.05
Steel	0.1	0.05
Chemicals	0.0	0.03
Refineries	0.1	0.02
Textiles	0.0	0.02
Clothing	0.0	0.04
Leather	0.1	0.04
Wood, paper	0.0	0.02
Motor Vehicles	0.1	0.03
Electronics	0.0	0.03
Other Machinery	0.1	0.04
Other Manufactured	0.0	0.04

16.3 Country assessments

According to our estimations (based on data for 2001) and on the basis of GTAP results (sectoral changes in percent, for exports and imports), the EU-

Chile trade agreement will generate for the whole EU additional trade flows amounting to more than 1.5 billion euro.

According to our projections, the EU-Chile agreement will generate a deterioration of the commercial balance for 12 Member States. Only Germany, Sweden and Finland will improve their net trade balance. Our analysis also shows that changes are very small in comparison to each country's trade.

Detailed figures for each country's estimations are given in Tables 16.5 to 16.19.

It is important to keep in mind that our calculations concern total and sectoral trade of EU and Member States *with the whole world*. The reason is that our point of departure is the result of GTAP simulations, which give the impact that the EU-Chile agreement will have on EU sectoral trade *with the whole world*.

As an example of interpretation of Tables 16.5 to 16.19, see below the first row of Table 16.5, which presents the results of our estimations for Germany. This row should be interpreted as follows:

- 30.7% of EU exports to the world in Other Machinery products originate from Germany.
- 22.3% of total EU imports from the world of Other Machinery products are destined for the German Market.
- Following the EU-Chile trade agreement, Germany's total exports in Other Machinery products will increase by more than 177 million euro, Germany total imports in Other Machinery products will increase by almost 42 million euro and Germany's commercial balance for Other Machinery products will rise by nearly 136 million euro.

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial Balance
Other Machinery	30.7	22.3	177 373	417 82	135 592

16.3.1 Germany

Germany is the largest trading country in the EU. In 2001, it accounted for almost one quarter of EU total exports and more than one fifth of EU total imports. The EU-Chile agreement will generate for Germany 431 million euro additional trade flows, which represents 27.5% of additional trade generated at the EU scale. This figure is notably greater than the weight of Germany in total EU trade (22.4%), indicating that Germany will be more than proportionately affected by the EU-Chile trade agreement.

The results of our estimations concerning Germany are presented in Table 16.5.

Germany's largest shares in EU exports concern Motor Vehicles (38.1% of EU exports), Other machinery (30.7%), Forestry (29.6%) and Non-Ferrous (26.4%).

For the first two sectors, GTAP simulations projected a 0.1% increase at the EU scale. These changes are likely to have an impact on Germany's exports. The larger the share of these sectors in Germany's total trade, the greater this impact.

Indeed, the considered sectors have an important weight in Germany's total exports (respectively 30.1% and 20.2% of German exports). Changes in the Motor Vehicles sector and the Other Machinery sector at the EU scale will be echoed in Germany, generating a substantial increase in exports amounting, respectively, to 116 and 177 million euro.

Turning to imports, Germany occupies a major place in EU trade flows in 19 sectors. The largest figures concern Other Agriculture (25.3% of EU sectoral imports), Clothing (24.8%), Non-Ferrous (22.8%) and Textile (22.6%).

GTAP projected an imports increase in these sectors at the EU scale. However, this may not significantly affect German trade, since each of these sectors is minor in German total imports (less than 7%). Indeed, major import progressions concern other sectors: Other Machinery (+42 million euro), Chemicals (+23 million euro) and Processed Foods (+22 million euro).

According to our estimations, the EU-Chile agreement will generate a 60 million euro increase in Germany's trade balance – the largest increase experienced by the 15 Member States, although small against Germany's total trade.

The main surpluses are expected to arise in Other Machinery (+136 million euro) and Motor Vehicles (+101 million euro). The largest declines in the trade balance will occur for Non-Ferrous (-52 million euro), Processed Foods (-45 million euro) and Chemicals (-22 million euro).

16.3.2 France

France is the second largest EU trader, accounting in 2001 for 14.6% of total EU total goods exports and 15.3% of total EU goods imports. The EU-Chile trade agreement will generate for this country additional trade flows amounting to 256 million euro. This represents 16.2% of additional trade flows generated at the EU scale. This is greater than France's share in EU total trade, suggesting that France will be more than proportionately affected by the agreement.

Table 16.6 summarises the likely impact of the EU-Chile trade agreement on France trade.

France's share in EU exports is over-represented for Grains (54.4% of EU sectoral exports), Forestry (25.9%), Beverages and Tobacco (25.7%), Cattle (21.9%), Dairy (19.7%), Other machinery (19.4%) and Meats (15%). From Table 16.6, we see that in all those sectors (excepted Other machinery) EU exports are expected either to stagnate or to decrease.

On the whole, exports are expected to increase (by 115 million euro), but less rapidly than imports. The largest progressions concern sectors that have an important weight in French total exports: Other Machinery (+112 million euro) and Motor Vehicles (+45 million euro). The largest exports reductions concern Processed Foods (-18 million euro) and Non-Ferrous (-14 million euro).

France's weight in EU sectoral imports is significant for Other Machinery (21.6%), Clothing (15.7%), Chemicals (15.3%) and Processed Food (15.2%). According to GTAP simulations, imports are expected to increase at the EU level for all these sectors. Other machinery and Chemicals have an important weight in French imports (respectively 27.8% and 15.8% of total French imports).

The largest increases in imports concern Other Machinery (+40 million euro), Processed Foods (+19 million euro) and Chemicals (+17 million euro).

Our estimations show that the EU-Chile agreement is likely to decrease the French goods trade balance by 24 million euro. Sector changes in commercial balances are divergent, though a majority of sectors undergo a deficit. The largest negative balances occur in Processed Foods (-37 million euro) and Non-Ferrous (-24 million euro).

Six sectors increase their trade balance as a result of the trade agreement and their existing comparative advantage. Gains are mostly concentrated in two sectors, Other Machinery, where the commercial balance increases by 72

million euro, and Motor Vehicles (+35 million euro). The competitive advantage improves in four other sectors: Steel (+5 million euro), Refineries (+3 million euro), Leather (+1 million euro), Cattle (+0.2 million euro).

16.3.3 United Kingdom

The EU-Chile agreement will generate 214 million euro worth of additional trade flows for the UK, which represent 13.7% of additional trade flows generated at the EU level. This is slightly greater than the UK's share in total EU goods trade, which was 12.9% in 2001.

The results of our estimations for UK are summarised in Table 16.7 .

The UK is over-represented in EU total exports in three sectors; Mining, where UK accounts for almost half of EU sectoral exports, Electronics (20 % of EU exports) and Beverages and Tobacco (18.5%).

With regard to EU total exports, GTAP simulations projected an increase for Mining and a decrease for Beverages. In the Mining sector, which includes petrochemicals and represents 9.4% of total UK exports, exports will rise by 25 million euro. The evolution in beverages is minute since this sector accounts for less than 2% of total UK imports.

Substantial increases in exports will occur for Other Machinery (+52 million euro) and Motor Vehicles (+26 million euro). Conversely, exports reductions will take place in 6 sectors. The largest declines concern Non-Ferrous (-15 million euro) and Processed Foods (-11 million euro).

The UK is over-represented in total EU imports for a large number of sectors: Other Manufactured (21.3% of total EU imports), Beverages and Tobacco (20.5%), Meats (19.2%), Electronics (18.7%), Wood Pulp and Paper (17.5%), Clothing (17.4%), Motor Vehicles (17.1%), Non-Ferrous (15.8%), Textiles (15.4%), and Leather (15.3%).

GTAP simulations projected an increase in EU imports for all these sectors. Among these sectors, two have an important weight in UK imports: Electronics (which account for 15.6% of total UK imports) and Motor Vehicles (12.5%). In these sectors, imports rise by respectively 16 and 13 million euro.

Table 16.6 shows that import increases will also occur in other sectors: Other machinery (+24 million euro), Processed Foods (+18 million euro), Chemicals (+14 million euro) and Non-Ferrous (+11 million euro).

The EU-Chile trade agreement will generate a trade deficit for the UK amounting to 53 million euro. The main losses come from Processed Foods (-29 million euro), Non-Ferrous (-26 million euro), Electronics (-16 million euro), Chemicals (-14 million euro) and Beverages (-10 million euro). Conversely, there is an improvement of commercial performances in six sectors and the most important gains emerge in Other Machinery (+28 million euro), Mining (+21 million euro) and Motor Vehicles (+12 million euro).

16.3.4 Italy

The EU-Chile agreement will generate for Italy 170 million euro of additional trade flows. This represents 10.9% of total additional trade generated at the EU level. This figure matches the share of Italy in total EU trade (10.8%).

Table 16.8 gives the results of our estimations for Italy.

Italy's share in EU total exports is over-represented for consumption goods, in particular in three sectors: Leather (43.8% of total EU exports), Clothing (29%) and Textiles (26.2%).

GTAP simulations projected changes in exports at the EU level only for Leather. However, this will not seriously affect Italian trade, since Leather only

represents 5.5% of Italian total exports. According to our estimations, Leather exports will increase by 15 million euro.

This change remains however small relative to the increase in exports in Other Machinery (79 million euro). Exports of Motor Vehicles products will also rise by 20 million euro. Important decreases in exports will arise for Non-Ferrous (-23 million euro) and Processed Foods (-15 million euro).

Turning to imports, the share of Italy in EU total imports for more important sectors is Cattle (27.5%), Grains (22.9%), Leather (19.6%), Dairy (15.9%), Forestry (15.6%) and Steel (15.2%).

GTAP simulations projected an increase in EU imports for Forestry, Steel and Leather, and a decrease in imports for Grains. However, this is not likely to deeply affect Italian imports, since these sectors are minor in Italy's total imports, as each one represents less than 4% of total Italy imports.

This is confirmed by Table 16.8, which shows that the largest changes in imports will occur in Other Machinery (+18 million euro), Chemicals (+13 million euro) and Processed Foods (+13 million euro).

The EU-Chile trade agreement will generate a reduction of Italy's commercial balance amounting to 17 million euro. This comes from an increase in imports more rapid than the progression of exports.

Improvement of commercial balances and comparative advantages will take place in seven sectors. The most important ones concern Other Machinery (commercial balance increase by 61 million euro), Leather (+12 million euro) and Motor Vehicles (+12 million euro). The main losses will arise for Non-Ferrous (commercial balance decreasing by 31 million euro), Processed Foods (-28 million euro), Chemicals (-13 million euro) and Other Agriculture (-10 million euro).

16.3.5 Belgium

The EU Chile trade agreement will provide Belgium with additional trade flows amounting to 106 million euro, which corresponds to 6.8% of the EU's additional trade. This percentage is less than the weight of Belgium in total EU trade, 8.2%, indicating that in relative terms, the agreement has a lesser impact that could have been expected.

Our estimations for Belgium trade are presented in Table 16.9 .

The greatest shares of Belgium in sector EU exports occur in Other Manufactured Goods (14.1% of EU sectoral exports), Mining (13.4%) and Refineries (12.5%).

GTAP simulations projected an increase of EU exports in the two last sectors. However the impact of these changes on Belgium trade is not likely to be significant since these sectors have a minor weight in Belgium exports.

This is confirmed by Table 16.9, which shows that major changes will take place in Motor Vehicles (+30 million euro) and Other Machinery (+22 million euro), Processed Foods (-17 million euro), Non-Ferrous Metals (-10 million euro).

The largest Belgian shares in sector EU imports relate to Other Manufactured Goods (13.4%), Dairy (12.2%), Grains (11.9%) and Chemicals (11.7%).

According to GTAP simulations, EU imports are expected to increase in all these sectors, except in Grains. The only change that may have a significant impact concerns Chemicals, which account for 13.7% of total Belgian imports; imports are expected to increase by 13 million euro.

Other changes are expected to take place in two sectors: Processed Foods (+10 million euro) and Other Machinery (+10 million euro).

The global effect of the EU-Chile trade agreement on Belgium commercial balance is negative, since it will lead to a 32 million euro deficit. Losses are concentrated in three sectors: Processed Foods (-28 million euro), Non-Ferrous (-15 million euro) and Chemicals (-13 million euro). The commercial balance and competitive advantage improves in seven sectors, but gains exceed 10 million only for Motor Vehicles (+22 million euro) and Other Machinery (+13 million euro).

16.3.6 Netherlands

The Netherlands will be relatively little affected by the EU-Chile agreement. This agreement is expected to generate 75 million euro of additional trade flows for Netherlands, which represents less than 5% of the additional flows generated at the EU level. This figure is relatively small, when compared with the weight of the Netherlands in total EU trade (almost 8%).

Table 16.10 depicts the results of our estimations for the Netherlands.

The Netherlands' weight in EU exports is significant in several sectors: Other agriculture (27.6% of EU exports), Refineries (23.6%), Mining (17.1%), Meats (16.3%), Cattle (15.8%), Electronics (15.8%) and Dairy (15.6%).

GTAP simulations project either a decrease or a stabilisation of exports in all these sectors, except for Mining. However, since most of these sectors are minor in the country's total trade, these changes are not likely to deeply affect the Netherlands trade[80].

This is confirmed by Table 16.10, which shows that the largest changes in exports mostly occur in other sectors. The main decreases in exports are in Processed Foods (-21 million euro), Other Agriculture (-18 million euro). The largest growths in exports concern Other Machinery (+28 million euro) and Refineries (+11 million euro).

The Netherlands' largest shares of EU imports are in Electronics (14.5% of total EU imports), Other Agriculture (13.3%) and Grains (13.1%). Only Electronics, which accounts for 22.8% of total the Netherlands' total imports, can be considered as a major sector.

GTAP simulations projected a 0.06% increase of imports in this sector. According to our estimations, this will generate a 13 million euro increase of imports for this sector.

Other largest changes in imports will occur in Processed Foods and Other Machinery (both +11 million euro).

On the whole, the EU-Chile agreement will reduce Netherlands commercial balance by 65 million euro. 14 sectors undergo losses, but the global reduction mainly comes from Processed Foods (-31 million euro), Other Agriculture (-22 million euro), Non-Ferrous (-14 million euro) and Electronics (-13 million euro). Conversely commercial balance improves in 6 sectors, but this improvement exceeds 10 million euro only for Other Machinery (+17 million euro) and Refineries (+11 million euro).

16.3.7 Spain

The EU-Chile trade agreement will generate 82 million euro of additional trade for Spain, which represents 5.2% of additional trade created at the EU level. This is slightly less than Spain's share in total EU trade: 5.9% in 2001.

Table 16.11 presents the results of our estimations for Spain.

[80] Only changes in Electronics could have had an impact, but GTAP projected no significant changes of exports in this sector.

Spain's share in EU sectoral exports is largest for Other Agriculture (20.3%), Fisheries (11.3%) and Motor Vehicles (9.8%). According to GTAP simulations, EU exports will decrease by 0.2% for the former sector and rise by 0.1% for the latter. These sectors are not minor in Spanish exports. Motor Vehicles products accounted for almost one quarter of total Spanish exports in 2001. Our estimations are for a 30 million euro increase of exports in this sector. For Other Agriculture, which account for 5.5% of Spanish total exports, the agreement will generate a 13 million euro decline.

Table 16.11 shows that other notable changes will take place in Other Machinery (+18 million euro) and Processed Foods (-13 million euro).

In Fisheries, Spain accounts for 18.3% of EU sector imports, in Grains 16.6%, in Motor Vehicles, 10.7% and Mining 9.2%. According to GTAP simulations, EU exports will shrink for Grains and will rise for Motor Vehicles and Mining. This is likely to have an impact only in the latter two sectors, which respectively represent 17.8% and 10.6% of total Spanish exports. This is confirmed by Table 16.11, which shows that imports will rise in these two sectors, respectively by 8 and 3 million euro.

From Table 16.11, we also see that the largest changes take place in other sectors: Processed Foods (+11 million euro), Other Machinery (+11 million euro).

According to our estimations, the Spanish trade balance will deteriorate by 39 million euro as a consequence of the EU-Chile trade agreement. This mainly comes from the deficit of Processed Foods (-24 million euro), Other Agriculture (-15 million euro) and Non-Ferrous Metal (-10 million euro). Six sectors improve their commercial balance, in particular Motor Vehicles where the surplus increases by 21 million euro.

16.3.8 Austria

The EU-Chile trade agreement will generate for Austria 54 million euro of additional trade flows, which corresponds to 3.4% of the additional trade flows generated at the EU level. This is in line with the weight of Austria in total EU trade: 3.3% in 2001.

Our estimations of the impact of the EU-Chile trade agreement on Austria are summarised in Table 16.12.

The best-represented sector is Forestry, for which the share of Austria in EU sector trade (7.4%) is more than twice the share of Austria in EU total trade (3.1%). However, since this sector is insignificant in Austria total trade, at less than 0.5 % of exports and imports, changes in this sector are not likely to affect the trade of this country.

According to Table 16.12, changes in exports, which are substantial as compared to the country size, will occur in Other Machinery (+19 million euro), Motor Vehicles (+11 million euro) and Non-Ferrous (-7 million euro).

Turning to imports, the main changes take place in Other Machinery (+7 million euro), Chemicals, Non-Ferrous, Processed Foods and Motor Vehicles (+3-4 million euro).

The EU-Chile trade agreement will have a negative impact on Austria's commercial balance (-9 million euro). This concerns the majority of sector, in particular Non-Ferrous (-10 million euro) and Processed Foods (-6 million euro). On the contrary, the comparative advantage of Austria will be reinforced for 6 sectors, namely in Other Machinery (the commercial balance increases by 11 million euro) and Motor Vehicles (7million euro).

16.3.9 Sweden

Sweden accounts for 3.1% of total EU trade. The EU-Chile trade agreement will generate for this country additional trade flows amounting to 55 million euro. This corresponds to 3.5% of total additional trade flows generated at the EU level.

Table 16.13 details our estimations for Sweden.

Sweden accounts for 3.1% of total EU trade. For some sectors, the share of Sweden largely exceeds its share in total trade. This is the case of Forestry, where Sweden accounts for 5.6% of EU exports and 11.8% of EU imports, Wood Pulp and Paper (11.4%, 2.6%) and Fisheries (6.8% and 5.2%).

According to GTAP simulations, exports will not change significantly in these sectors. Changes in exports will take place in other sectors that represent a significant proportion of Sweden's total exports: Other Machinery (+21 million euro), Motor Vehicles (+10 million euro), Non-Ferrous (-5 million euro).

Turning to imports, GTAP projects an increase in EU imports for sectors where Sweden is relatively more represented in EU trade: +0.01% for Fisheries and +0.02% for Wood Pulp and Paper. This is not likely to have a significant impact since these two sectors are minor in Sweden imports. More major changes in imports will happen in Other Machinery (+6 million euro), Processed Foods (+4 million euro) and Chemicals (+3 million euro).

The EU-Chile trade agreement will increase the Swedish commercial balance by 3 million euro. The deterioration of the commercial balances will occur in especially Non-Ferrous (-7 million euro) and Processed Foods (-6 million euro). Sweden's competitive advantage is reinforced in 6 sectors, in particular, Other Machinery (the commercial balance increases by 15 million euro), Motor Vehicles (+7 million euro), Steel (+3 million euro) and Refineries (+2 million euro).

16.3.10 Ireland

The EU-Chile trade agreement will have a limited impact on Ireland's trade. The agreement is expected to generate 23 million euro of additional trade, which represents 1.5% of the additional trade generated at the EU level. This figure is below the weight of Ireland in total EU trade, which was 2.6% in 2001.

The results of our estimations for Ireland are recapitulated in Table 16.14.

Concerning exports, the largest share of Ireland in EU total exports concerns Cattle (10.2%), Chemicals (7.9%) and Meats (6.9%). Note that Ireland's share in these sectors exceeds its global weight in EU total exports (3%). GTAP predicts no changes for exports at the EU level in the first two sectors, and a decrease for Meats.

Table 16.14 shows that changes in exports exceed 10 million euro only in one sector, Other Machinery (+11 million euro). Increases in exports in other sectors never reach one million euro. The largest decline in exports concerns Processed Foods (-5 million euro) and Meats (-2 million euro).

Ireland's largest shares in EU sectoral imports are those of Electronics (6.8%) and Cattle (4.4%). According to GTAP, Electronics should experience a 0.06% growth in imports, while imports should decline by 0.02% for Cattle. Since Electronics represent 37% of total Irish imports, the 0.06% percentage growth generates a non-negligible increase in Electronics imports: +6 million euro. Conversely for Cattle, whose weight in Irish imports is below 1%, the decrease of imports is negligible. Other largest increases in import (still below 5 million euro) will occur for Other Machinery (3 million euro) Processed Foods (3 million euro) and Chemicals (2 million euro).

The EU-Chile trade agreement will generate a 17 million euro reduction of the commercial balance for Ireland. Losses mainly come from Processed Foods (-8 million euro), Electronics (-6 million euro) and Chemicals (-2 million euro). The only sector where commercial balance improves significantly is Other Machinery (+7 million euro).

16.3.11 Denmark

The EU-Chile trade agreement will produce 20 million euro of additional trade for Denmark, which represents 1.3% of additional trade generated at the EU level. This is below Denmark's weight in total EU trade, which was 2.3% in 2001. Table 16.15 gives the results of our estimations for Denmark.

In spite of its small size, Denmark is over-represented in EU exports for two sectors: Fisheries (Denmark accounts for 22.8% of sectoral EU exports) and Meats (17.3%). Other sectors where the share of Denmark in sectoral EU exports is significantly above its share in total EU trade Dairy (6.6%) and Processed Foods (6.2%).

According to GTAP simulations, the only sector that will undergo a significant change in exports is Meats (-0.1%). Since Meats accounts for almost 9% of total Danish exports, this evolution will create a significant decrease in Meats exports: -4 million euro. Other significant evolutions concern Processed Foods (-9 million euro), Non-Ferrous (-4 million euro) and Other Machinery (+10 million euro).

Denmark's largest shares in EU sector imports relate to Fisheries (14.3% of sectoral EU imports), Other Manufactured (4.8%) and Processed Foods (4.1%).

The last two sectors are projected to undergo an increase in imports respectively by 0.16% and 0.04%. This is not likely to cause significant changes for Other Manufactures imports, since this sector is of minor importance in Danish total imports. For Processed Foods, which represents more than 5% of total Danish imports, imports will increase by more than 5 million euro. The largest increase in imports will take place in the Other Machinery sector (+6 million euro).

The EU-Chile agreement will generate a 29 million reduction in the commercial balance for Denmark. The most important deficits will occur in Processed Foods (-14 million euro), Non-Ferrous (-6 million euro), Meats (-5 million euro). A surplus will be produced in 6 sectors and in two it will exceed one million euro: Other Machinery (+4 million euro) and Mining (+2 million euro).

16.3.12 Greece

The EU-Chile agreement will create additional trade flows amounting to 22 million euro for Greece, which represents 1.4% of additional trade flows produced at the EU level. This is lower than Greece's weight in total EU trade of 2%. The results of our estimations concerning Greece are presented in Table 16.16.

In 2001, this country accounts for more than one-fifth of total EU exports in Other Manufactured Goods. Other sectors where Greece's share in EU exports is noticeable are Electronics (9.8%) and Fisheries (5.4%). GTAP projected no significant evolution of exports in these sectors. Indeed, Table 16.16 shows that the change in exports will be noticeable only for Other Machinery (+13 million euro). Smaller decreases in exports will take place in Processed Food (-2 million euro) and Other Agriculture (-2 million euro).

Turning to imports, Greece's share in EU sectoral import never exceeds 4%. The largest shares relate to Grains (3.6%), Dairy (3%) and Meats (2.9%). The GTAP simulations projected a decline in EU imports in the first sector

mentioned and an increase in the last one noted. However, since these sectors are of lesser importance in Greece's total imports, these changes are not likely to have a deep impact. Indeed, as shown in Table 16.16, significant changes for exports will take place in Other Machinery (+3 million euro), Processed Foods (+2 million euro) and Chemicals (+1 million euro).

The impact of the EU-Chile trade agreement on Greece's commercial balance is negligible: -1.3 million euro. Main losses come from Processed Foods (-2 million euro), Other Agriculture (-2 million euro) and Non-Ferrous (-1 million euro). The commercial balance improves mainly in Other Machinery (+10 million euro) and Refineries (+1 million euro).

16.3.13 Finland

In 2001, Finland accounted for 1.7% of total EU trade. The EU-Chile trade agreement will generate for this country additional trade flows amounting to 27 million euro. This corresponds to 1.8% of the additional trade flows created at the EU scale. Table 16.17 summarises the results of our estimations for Finland.

In Forestry, Finland represents 3.1% of EU exports and 13.2% of EU imports. In Wood, Pulp and Paper its shares of exports and imports amounted to 11.6% and 1.2% in 2001 respectively.

GTAP simulations projected changes in exports will happen in sectors that have an important weight in Finland's total exports. In particular, exports in Other Machinery are expected to increase by 12 million euro. Other increases, while still less than 2 million euro, are expected to take place in Steel, Motor Vehicles and Refineries.

Turning to imports, non-negligible changes will occur in sectors which have an important weight in Finland's total exports: Other machinery (+3 million euro), Processed Food, Chemicals and Electronics (+1-2 million euro).

The EU-Chile trade agreement will improve Finland's commercial balance by 1 million euro. The main increases will occur in Other Machinery (+9 million euro), Steel, Refineries and Motor Vehicles (+1-1.5 million euro). Deterioration of sector commercial balances will happen in the majority of sectors, particularly for Non-Ferrous (-3 million euro) and Processed Foods (-2 million euro).

16.3.14 Portugal

The EU-Chile agreement will generate for Portugal 25 million euro of additional trade, which corresponds to 1.5% of additional trade flows generated at the EU level. This figure is consistent with the weight of Portugal in EU total trade: 1.4%. Table 16.17 summarises the estimated impact of the EU-Chile trade agreement on Portugal's trade.

The weight of Portugal in EU sectoral exports is low: the figure reaches 5% in only two sectors Leather (5.2%) and Forestry (5%). GTAP projects a 0.1% or 2 million euro increase in Leather exports, as this sector represents 6.5% of total Portugal exports. Turning to Table 16.17, we see that changes in exports concern Motor Vehicles (+4 million euro), Other Machinery (+4 million euro), Processed Foods (-1 million euro) and Non-Ferrous (-1 million euro).

The largest share of Portugal in EU sector imports concern Grains (7%) and Forestry (6.2%). GTAP projects a decrease in imports for the first sector and an increase for the latter. However, this will not have a significant impact since these two sectors are minor in Portugal's total imports.

This is confirmed by Table 16.17, which shows that the largest changes in imports will take place in Processed Foods (+4 million euro), Other Machinery

(+3 million euro), Chemicals (+2 million euro) and Motor Vehicles (+2 million euro).

On the whole, Portugal will undergo a 10 million euro deterioration of its commercial balance. Most of this comes from deficits in Processed Foods (-5 million euro), Non-Ferrous (-3 million euro), Chemicals (-2 million euro). Conversely, the commercial balance will improve for Motor Vehicles (+3 million euro) and Leather (+1 million euro).

16.3.15 Luxembourg

Luxembourg has the smallest weight in EU total trade: only 0.5% in 2001. The EU-Chile trade agreement will have a small impact on this country, triggering 7 million euro worth of additional trade flows, which corresponds to 0.4% of additional trade flows generated at the EU level. The results of our estimations concerning Luxembourg are presented in Table 16.19.

Since Luxembourg is the smallest Member State, its share in exports and imports rarely reaches 1%. The most represented sectors are Steel, where Luxembourg accounts for 2.7% of total EU exports and 1.8 % of total EU imports, Beverages, with respective shares amounting to 0.6% and 1.4%, and Refineries (0% and 1.1%).

GTAP simulations projected export changes at the EU level in these three sectors. Exports are expected to rise for Steel (+0.1%) and Refineries (+0.1%) and to decline for Beverages (-0.1%). This is likely to have a significant impact only in the Steel sector, which represents 18.3% of total Luxembourg exports. Exports in this sector are expected to increase by almost 2 million euro. The other sectoral increase in exports exceeding 1 million euro will take place in Other Machinery.

Turning to imports, GTAP simulations predicted an increase in EU imports for Steel, Refineries and Beverages. Steel imports will increase at the EU level by 0.05% for, Beverages by 0.09% and Refineries by 0.02%. The most significant impact will happen in the Steel sector, which represents more than 9% of Luxembourg's total imports; as shown by Table 16.19, imports will increase by 545 thousand million euro in this sector. Other major evolutions that are above one million euro concern Other Machinery (0.75 million euro) and Electronics (0.69 million euro).

The global effect of the EU-Chile trade agreement on the Luxembourg commercial balance is negative. It will generate a very small deficit in almost all sectors. However, Luxembourg will improve its relative commercial advantage in two sectors: Steel (the commercial balance swelling by 1.3 million euro) and Other Machinery (+0.426 million euro).

16.4 Commentary on Summary Tables

Table 16.2 below summarises the likely impact of the EU-Chile trade agreement on sectoral commercial balances of the 15 Member States. A positive impact is denoted by "+", a negative impact by "-". "0" means that the impact in negligible, i.e. null or inferior to 2 million euro. Detailed figures are given through Tables 16.4 to 16.19.

Germany and Sweden show an improvement in the total commercial balance. For Greece and Finland, the evolution of the total commercial balance directly linked to the EU-Chile trade agreement can be considered as negligible (inferior to 2 million euro). Other countries undergo lower trade balances as the rest of the world lends to them.

Table 16.3 gives, for each country, the evolution of sectoral commercial balances (in absolute value) as a percentage of the absolute value of sectoral commercial balances. For example, in the column for France, the first row

means that the evolution of commercial balance in the Grains sector generated by the EU-Chile Trade agreement only represents 0.21 % of the commercial balance for the total Grains sector.

Table 16.4 gives, for each Member State, the evolution of sectoral commercial balances (in absolute value) as a percentage of total sectoral trade (exports + imports). For example, in the column for France, the first row means that the evolution of the commercial balance in the Grains sector produced by the EU-Chile trade agreement represents 0.19 % of total French trade in Grains.

The largest figures concern three countries. For Denmark, the EU-Chile trade agreement will reduce by half the commercial balance in the Beverages sector. However, this only represents 1 million euro. For Italy, the commercial balance in the Other Agriculture sector will shrink by almost one-sixth. Table 16.4 shows that this represents a small amount in comparison to Italian trade in this sector: only 0.13%. For Austria, the commercial balance in the Meats sector is likely to contract by some 20%. However, as shown by Table 16.4, this change is negligible when compared to Austrian trade in this sector (only 0.09%).

On the whole, Table 16.4 confirms that the EU-Chile agreement will have only a marginal impact on EU countries trade, even when detailed by sectors. The largest figures in this Table do not attain 0.2%. This means that the largest changes in sectoral commercial balances, linked to the EU-Chile agreement, represent at best 0.2% of sectoral trade, which is negligible.

16.5 Conclusion

To conclude, we see from the previous analysis that the EU-Chile trade agreement will generate changes in exports, imports and commercial balances of Member States. However, these evolutions remain slight in magnitude and are not likely to have significant effects on EU countries trade.

This conclusion is also valid at the sectoral level. The study of sectoral issues shows that no sector is likely to be significantly affected by this agreement.

In no case does the impact of the agreement on EU countries' total commercial balances or indeed on any sector come remotely close to being a significant sustainability issue. The EU-Chile trade agreement leads to $ 800 million in additional income for the EU without causing any serious disruption at sector level.

16.6 Tables

Table 16.2: Overview of changes of commercial balances due to the trade agreement

	Germany	France	UK	Italy	Belgium	Netherlands	Spain	Austria
Grains	-	-	0	0	0	0	0	0
Other Agriculture	-	-	-	-	-	-	-	0
Cattle	0	0	0	0	0	0	0	0
Dairy	0	0	0	0	0	0	0	0
Meats	-	-	-	-	-	-	-	0
Fisheries	0	0	0	0	0	0	0	0
Forestry	0	0	0	0	0	0	0	0
Processed Foods	-	-	-	-	-	-	-	-
Beverages	-	-	-	-	-	-	-	0
Mining	-	-	+	-	+	+	-	0
Non-Ferrous	-	-	-	-	-	-	-	-
Steel	+	+	+	+	+	0	0	+
Chemicals	-	-	-	-	-	-	-	-
Refineries	+	+	+	+	+	+	+	0
Textiles	-	0	-	0	0	0	0	0
Clothing	-	-	-	-	0	0	0	0
Leather	0	0	0	+	0	0	+	0
Wood	-	-	-	-	0	0	0	0
Motor Vehicles	+	+	+	+	+	+	+	+
Electronics	-	-	-	-	-	-	-	-
Other Mach.	+	+	+	+	+	+	+	+
Other Manufact.	-	-	-	-	-	-	0	0
Total	**+**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Share in EU trade*	**22.4**	**15.0**	**12.9**	**10.8**	**8.0**	**7.9**	**5.9**	**3.3**

	Sweden	Ireland	Denmark	Greece	Finland	Portugal	Luxembourg
Grains	0	0	0	0	0	0	0
Other Agriculture	0	0	-	-	0	0	0
Cattle	0	0	0	0	0	0	0
Dairy	0	0	0	0	0	0	0
Meats	0	0	-	0	0	0	0
Fisheries	0	0	0	0	0	0	0
Forestry	0	0	0	0	0	0	0
Processed Foods	-	-	-	-	-	-	0
Beverages	0	0	0	0	0	0	0
Mining	0	0	+	0	0	0	0
Non-Ferrous	-	0	-	0	-	0	0
Steel	+	0	0	0	0	0	0
Chemicals	-	-	-	0	0	0	0
Refineries	+	0	0	0	0	0	0
Textiles	0	0	0	0	0	0	0
Clothing	0	0	0	0	0	0	0
Leather	0	0	0	0	0	0	0
Wood	0	0	0	0	0	0	0
Motor Vehicles	+	0	0	0	0	+	0
Electronics	-	-	-	0	0	0	0
Other Mach.	+	+	+	+	+	0	0
Other Manufact.	0	0	0	0	0	0	0
Total	**+**	**-**	**-**	**0**	**0**	**-**	**-**
Share in EU trade*	**3.1**	**2.6**	**2.3**	**2.0**	**1.8**	**1.4**	**0.5**

* percentage
\- negative impact
\+ positive impact
0 zero or negligible impact (less than 2 million euro)

Table 16.3: Changes in absolute value of commercial balances due to the trade agreement as a % of total commercial balances

%	Germany	France	UK	Italy	Belgium	Netherlands	Spain	Austria
Grains	0.28	0.21	0.29	0.01	0.01	0.01	0.03	0.36
Other Agriculture	0.11	0.47	0.08	14.34	1.17	1.20	0.49	0.15
Cattle	0.06	0.03	0.08	0.02	0.32	0.01	0.51	0.04
Dairy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meats	0.52	0.92	0.11	0.14	0.22	0.22	0.33	19.10
Fisheries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry	0.15	1.52	0.01	0.01	0.02	0.02	0.01	0.01
Processed Foods	2.29	1.35	0.50	8.23	1.27	0.82	8.53	0.73
Beverages	3.17	0.22	0.70	0.51	2.07	0.21	1.59	0.22
Mining	0.01	0.02	0.36	0.02	0.03	0.06	0.01	0.01
Non-Ferrous	1.23	0.51	0.36	0.46	2.82	0.83	1.74	1.09
Steel	0.25	0.52	0.41	0.17	0.19	5.02	0.07	0.18
Chemicals	0.12	0.37	0.59	1.18	0.20	0.15	0.21	0.11
Refineries	0.04	0.18	0.68	1.04	0.84	0.15	0.52	0.00
Textiles	0.11	0.10	0.04	0.02	0.03	0.18	0.17	0.18
Clothing	0.07	0.08	0.06	0.04	0.39	0.08	0.09	0.07
Leather	0.01	0.09	0.02	0.15	0.28	0.16	0.21	0.45
Wood	0.14	0.08	0.04	0.07	0.34	0.34	0.09	0.03
Motor Vehicles	0.16	0.34	0.06	0.13	0.52	0.14	1.33	6.84
Electronics	0.13	0.22	1.03	0.07	0.27	2.55	0.05	0.11
Other Mach.	0.19	0.63	0.37	0.18	0.90	1.40	0.08	1.31
Other Manuf.	0.20	0.24	0.04	0.06	2.25	0.67	0.09	0.60
Total	**0.07**	**0.19**	**0.07**	**0.10**	**0.61**	**0.71**	**0.10**	**0.10**

%	Sweden	Ireland	Denmark	Greece	Finland	Portugal	Luxembourg
Grains	0.23	0.07	0.35	0.05	0.27	0.01	0.12
Other Agriculture	0.08	0.23	0.62	0.59	0.07	0.12	0.12
Cattle	0.06	0.02	0.04	0.04	0.01	0.03	0.14
Dairy	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meats	0.15	0.15	0.12	0.08	3.15	0.08	0.14
Fisheries	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry	0.01	0.02	0.03	0.01	0.01	0.01	0.02
Processed Foods	0.50	1.08	1.17	4.84	0.35	0.34	0.37
Beverages	1.25	0.46	54.97	0.33	0.25	0.39	0.39
Mining	0.01	0.01	0.16	0.01	0.02	0.01	0.01
Non-Ferrous	0.73	0.23	0.84	0.39	0.49	0.31	2.59
Steel	0.19	0.03	0.03	0.01	0.18	0.03	0.17
Chemicals	0.21	0.01	0.16	0.04	0.15	0.06	0.15
Refineries	0.29	0.00	0.21	0.21	0.27	0.02	0.02
Textiles	0.05	0.03	0.88	0.14	0.04	0.05	0.02
Clothing	0.06	0.06	0.19	0.30	0.06	0.03	0.08
Leather	0.01	0.01	0.02	0.04	0.04	0.16	0.02
Wood	0.01	0.02	0.05	0.02	0.00	0.05	0.08
Motor Vehicles	0.27	0.01	0.03	0.03	0.13	0.15	0.00
Electronics	7.66	0.07	0.05	0.00	0.04	0.07	0.10
Other Mach.	0.28	0.33	0.07	0.16	0.23	0.02	0.06
Other Manuf.	0.19	0.25	0.04	0.00	0.07	0.06	0.07
Total	**0.02**	**0.09**	**0.30**	**0.004**	**0.01**	**0.06**	**0.13**

Table 16.4: Changes in absolute value of commercial balances due to the trade agreement as a % of total trade

%	Germany	France	UK	Italy	Belgium	Netherlands	Spain	Austria
Grains	0.15	0.19	0.07	0.01	0.01	0.01	0.02	0.13
Other Agriculture	0.08	0.11	0.07	0.13	0.12	0.14	0.15	0.09
Cattle	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Dairy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meats	0.08	0.09	0.07	0.08	0.09	0.09	0.09	0.09
Fisheries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Processed Foods	0.18	0.18	0.17	0.18	0.18	0.18	0.18	0.18
Beverages	0.09	0.10	0.10	0.10	0.09	0.10	0.09	0.10
Mining	0.01	0.01	0.05	0.02	0.01	0.02	0.01	0.01
Non-Ferrous	0.08	0.07	0.07	0.08	0.08	0.07	0.07	0.07
Steel	0.04	0.03	0.02	0.02	0.04	0.03	0.01	0.04
Chemicals	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Refineries	0.02	0.03	0.04	0.04	0.04	0.07	0.04	0.00
Textiles	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Clothing	0.03	0.03	0.03	0.01	0.02	0.03	0.03	0.03
Leather	0.00	0.02	0.01	0.06	0.04	0.02	0.05	0.03
Wood	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Motor Vehicles	0.06	0.04	0.02	0.02	0.04	0.02	0.04	0.04
Electronics	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Other Mach.	0.05	0.03	0.03	0.05	0.03	0.03	0.02	0.03
Other Manuf.	0.02	0.02	0.04	0.02	0.02	0.02	0.03	0.02
Total	**0.006**	**0.003**	**0.009**	**0.003**	**0.008**	**0.017**	**0.014**	**0.006**

%	Sweden	Ireland	Denmark	Greece	Finland	Portugal	Luxembourg
Grains	0.17	0.04	0.13	0.03	0.15	0.01	0.05
Other Agriculture	0.07	0.10	0.12	0.15	0.06	0.08	0.08
Cattle	0.01	0.01	0.01	0.01	0.00	0.02	0.01
Dairy	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meats	0.08	0.09	0.10	0.07	0.09	0.07	0.08
Fisheries	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Processed Foods	0.17	0.18	0.18	0.18	0.17	0.17	0.17
Beverages	0.09	0.10	0.09	0.09	0.09	0.10	0.09
Mining	0.01	0.00	0.06	0.01	0.02	0.01	0.01
Non-Ferrous	0.08	0.07	0.08	0.07	0.08	0.07	0.07
Steel	0.04	0.01	0.01	0.01	0.04	0.02	0.04
Chemicals	0.01	0.01	0.01	0.02	0.02	0.02	0.02
Refineries	0.05	0.00	0.03	0.06	0.05	0.01	0.02
Textiles	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Clothing	0.03	0.03	0.02	0.02	0.03	0.01	0.03
Leather	0.00	0.00	0.01	0.01	0.01	0.05	0.02
Wood	0.00	0.01	0.01	0.02	0.00	0.01	0.01
Motor Vehicles	0.05	0.01	0.01	0.02	0.02	0.02	0.00
Electronics	0.02	0.02	0.02	0.00	0.01	0.02	0.01
Other Mach.	0.04	0.04	0.02	0.05	0.04	0.01	0.01
Other Manuf.	0.02	0.02	0.04	0.00	0.03	0.03	0.03
Total	**0.002**	**0.013**	**0.027**	**0.001**	**0.001**	**0.015**	**0.012**

Table 16.5: Estimation of the impact of the EU-Chile agreement for Germany

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	30.7	22.3	177373	41782	135592
Motor Vehicles	38.1	19.5	116128	15330	100797
Steel	23.8	19.3	15820	5914	9906
Refineries	9.6	21.7	4645	2182	2462
Leather	8.7	19.3	2922	2605	317
Cattle	14.2	19.1	0	-293	293
Dairy	22.4	17.8	0	0	0
Fisheries	4.2	8.5	0	0	0
Forestry	29.6	9.6	0	34	-34
Grains	20.7	7.2	-2908	-91	-2817
Textiles	18.4	22.6	0	2984	-2984
Wood, paper	20.3	19.4	0	3871	-3871
Other Manufactured	13.8	16.6	0	3938	-3938
Mining	4.6	21.8	2342	7927	-5586
Clothing	15.9	24.8	0	5992	-5992
Meats	12.7	18.0	-3159	3041	-6200
Beverages	11.1	17.2	-4060	3880	-7940
Other Agriculture	7.2	25.3	-4682	8069	-12751
Electronics	18.1	21.2	0	18391	-18391
Chemicals	22.2	20.2	0	22628	-22628
Processed Foods	16.2	17.2	-23022	21524	-44546
Non-Ferrous	26.4	22.8	-35843	15827	-51670
Total	**24.1**	**20.8**	**245554**	**185536**	**60019**

GTAP simulations. Source: Comext. Calculations: Planistat.

Row one should be interpreted as follows. 30.7% of total EU exports in Other Machinery products originate from Germany. 22.3% of total EU imports in Other Machinery products are destined for the German Market. Following the EU-Chile trade agreement, Germany's total exports in Other Machinery products will increase by more 177 million euro, its total imports in Other Machinery products will increase by almost 42 million euro and its commercial balance for Other Machinery products will rise by 136 million euro.

Table 16.6: Estimation of the impact of the EU-Chile agreement for France

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	19.4	21.6	112325	40335	71990
Motor Vehicles	14.8	13.3	45006	10474	34532
Steel	14.9	14.5	9934	4436	5498
Refineries	10.0	13.5	4852	1361	3491
Leather	10.3	14.9	3468	2013	1456
Cattle	21.9	11.1	0	-170	170
Dairy	19.7	13.0	0	0	0
Fisheries	12.9	18.6	0	0	0
Forestry	25.9	9.0	0	32	-32
Textiles	11.7	14.5	0	1916	-1916
Other Manufactured	14.5	12.1	0	2861	-2861
Wood, paper	9.9	14.4	0	2883	-2883
Clothing	12.7	15.7	0	3797	-3797
Mining	2.5	14.5	1272	5249	-3977
Meats	15.0	12.8	-3725	2158	-5882
Grains	54.4	3.7	-7618	-46	-7572
Electronics	10.9	11.5	0	9965	-9965
Other Agriculture	12.1	12.0	-7798	3826	-11624
Beverages	25.7	14.6	-9359	3290	-12649
Chemicals	14.5	15.3	0	17123	-17123
Non-Ferrous	10.5	13.6	-14216	9427	-23643
Processed Foods	12.9	15.2	-18338	19121	-37459
Total	**14.6**	**15.3**	**115804**	**140050**	**-24246**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.7: Estimation of the impact of the EU-Chile agreement for UK

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	9.1	12.8	52391	23992	28400
Mining	48.9	10.6	25129	3860	21270
Motor Vehicles	8.4	17.1	25515	13443	12072
Refineries	13.4	11.4	6501	1144	5358
Steel	7.0	8.4	4651	2576	2075
Cattle	9.6	11.1	0	-171	171
Dairy	4.4	11.5	0	0	0
Fisheries	13.9	5.5	0	0	0
Forestry	1.6	3.0	0	10	-10
Grains	4.7	8.2	-653	-103	-550
Leather	4.4	15.3	1490	2060	-570
Textiles	7.5	15.4	0	2027	-2027
Wood, paper	7.9	17.5	0	3507	-3507
Meats	3.5	19.2	-869	3236	-4106
Clothing	7.9	17.4	0	4203	-4203
Other Manufactured	1.1	21.3	0	5054	-5054
Other Agriculture	1.8	14.8	-1141	4728	-5869
Beverages	18.5	20.5	-6756	4613	-11369
Chemicals	11.9	12.9	0	14445	-14445
Electronics	20.0	18.7	0	16239	-16239
Non-Ferrous	10.9	15.8	-14811	10981	-25792
Processed Foods	7.6	14.1	-10764	17750	-28515
Total	**11.2**	**14.7**	**80682**	**133595**	**-52913**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.8: Estimation of the impact of the EU-Chile agreement for Italy

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	13.6	9.5	78637	17676	60960
Leather	43.8	19.6	14687	2644	12044
Motor Vehicles	6.8	11.4	20704	8975	11729
Refineries	10.2	9.0	4934	910	4025
Steel	11.4	15.2	7599	4653	2946
Cattle	1.6	27.5	0	-423	423
Grains	1.4	22.9	-191	-287	96
Dairy	5.5	15.9	0	0	0
Fisheries	4.9	12.8	0	0	0
Forestry	1.5	15.6	0	55	-55
Textiles	26.2	12.7	0	1671	-1671
Other Manufactured	15.1	8.8	0	2090	-2090
Wood, paper	6.8	10.7	0	2142	-2142
Clothing	29.0	9.2	0	2215	-2215
Mining	1.3	11.5	675	4158	-3482
Meats	5.5	19.3	-1358	3259	-4618
Beverages	9.7	9.7	-3522	2174	-5696
Electronics	4.0	6.8	0	5888	-5888
Other Agriculture	12.1	7.2	-7852	2313	-10165
Chemicals	10.1	11.2	0	12534	-12534
Processed Foods	10.7	10.1	-15110	12627	-27737
Non-Ferrous	16.7	11.5	-22577	7992	-30569
Total	**11.1**	**10.5**	**76626**	**93266**	**-16640**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.9: Estimation of the impact of the EU-Chile agreement for Belgium

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Motor Vehicles	9.8	9.7	29824	7671	22153
Other Machinery	3.9	5.1	22443	9552	12891
Steel	12.5	8.5	8301	2614	5686
Refineries	12.9	11.2	6244	1126	5118
Mining	13.4	10.4	6903	3778	3125
Leather	7.5	5.6	2530	758	1771
Cattle	6.9	5.7	0	-88	88
Dairy	9.9	12.2	0	0	0
Fisheries	2.1	5.2	0	0	0
Forestry	6.1	4.1	0	14	-14
Grains	1.6	11.9	-223	-149	-74
Textiles	11.0	6.9	0	912	-912
Clothing	8.8	6.2	0	1491	-1491
Wood, paper	6.4	7.5	0	1495	-1495
Other Manufactured	14.1	13.4	0	3174	-3174
Beverages	4.7	7.6	-1731	1708	-3439
Electronics	3.9	4.0	0	3483	-3483
Meats	12.1	5.2	-3010	878	-3888
Other Agriculture	10.3	7.7	-6649	2461	-9109
Chemicals	11.8	11.7	0	13076	-13076
Non-Ferrous	7.5	6.9	-10137	4804	-14941
Processed Foods	12.2	8.3	-17313	10361	-27674
Total	**8.1**	**7.9**	**37181**	**69120**	**-31938**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.10: Estimation of the impact of the EU-Chile agreement for Netherlands

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	4.8	5.6	27589	10548	17041
Refineries	23.6	8.6	11419	870	10549
Mining	17.1	9.6	8779	3491	5287
Motor Vehicles	2.8	4.6	8522	3595	4927
Steel	5.7	6.1	3786	1874	1912
Leather	4.5	5.9	1518	790	728
Cattle	15.8	5.3	0	-81	81
Dairy	15.6	10.3	0	0	0
Fisheries	8.6	5.0	0	0	0
Forestry	2.4	2.0	0	7	-7
Grains	1.8	13.1	-247	-165	-83
Textiles	4.6	5.1	0	676	-676
Wood, paper	6.1	7.1	0	1414	-1414
Clothing	5.3	6.5	0	1562	-1562
Other Manufactured	8.4	7.7	0	1822	-1822
Meats	16.3	7.1	-4030	1191	-5221
Beverages	13.1	6.8	-4765	1532	-6297
Chemicals	7.5	7.1	0	7959	-7959
Electronics	15.8	14.5	0	12604	-12604
Non-Ferrous	6.5	7.6	-8876	5292	-14168
Other Agriculture	27.6	13.3	-17857	4256	-22113
Processed Foods	14.8	8.4	-20903	10594	-31496
Total	**8.1**	**7.8**	**4935**	**69831**	**-64896**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.11: Estimation of the impact of the EU-Chile agreement for Spain

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Motor Vehicles	9.8	10.7	29780	8451	21329
Other Machinery	3.1	5.8	17729	10760	6969
Refineries	6.1	6.7	2932	674	2258
Leather	8.7	5.6	2918	748	2170
Steel	5.4	8.3	3622	2557	1064
Cattle	5.7	5.2	0	-80	80
Dairy	3.2	6.0	0	0	0
Fisheries	11.3	18.3	0	0	0
Forestry	6.6	8.7	0	30	-30
Grains	3.3	16.6	-463	-208	-254
Textiles	5.4	6.2	0	814	-814
Other Manufactured	2.8	4.8	0	1138	-1138
Wood, paper	4.2	5.8	0	1165	-1165
Clothing	4.6	5.2	0	1262	-1262
Meats	6.5	3.8	-1603	645	-2248
Mining	1.9	9.2	998	3352	-2354
Electronics	1.9	4.1	0	3547	-3547
Beverages	5.3	8.7	-1930	1957	-3886
Chemicals	4.9	6.5	0	7282	-7282
Non-Ferrous	4.8	5.1	-6550	3565	-10114
Other Agriculture	20.3	6.5	-13130	2063	-15193
Processed Foods	9.1	8.6	-12871	10739	-23610
Total	**5.0**	**6.7**	**21432**	**60460**	**-39027**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.12: Estimation of the impact of the EU-Chile agreement for Austria

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	3.2	3.8	18513	7055	11458
Motor Vehicles	3.5	4.0	10708	3179	7528
Steel	5.1	3.4	3407	1035	2372
Leather	3.5	3.9	1169	524	645
Refineries	0.9	3.5	413	357	56
Cattle	1.3	2.2	0	-34	34
Dairy	2.7	2.4	0	0	0
Fisheries	0.1	0.6	0	0	0
Forestry	7.4	12.4	0	44	-44
Grains	2.5	1.3	-353	-16	-337
Mining	0.7	2.0	364	734	-369
Textiles	3.3	3.8	0	495	-495
Clothing	2.6	3.8	0	918	-918
Other Manufactured	4.3	3.9	0	934	-934
Wood, paper	7.1	4.7	0	940	-940
Meats	2.8	2.9	-695	482	-1177
Beverages	2.7	1.5	-998	347	-1345
Other Agriculture	1.1	2.7	-731	872	-1603
Electronics	2.3	2.9	0	2522	-2522
Chemicals	2.2	3.4	0	3840	-3840
Processed Foods	1.9	2.8	-2694	3508	-6202
Non-Ferrous	4.9	5.5	-6656	3807	-10463
Total	**3.1**	**3.5**	**22445**	**31543**	**-9098**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.13: Estimation of the impact of the EU-Chile agreement for Sweden

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	3.6	3.4	20907	6313	14594
Motor Vehicles	3.2	2.7	9778	2088	7690
Steel	5.9	4.2	3943	1285	2658
Refineries	5.0	3.4	2430	344	2086
Cattle	0.8	1.1	0	-16	16
Dairy	0.9	1.3	0	0	0
Fisheries	6.8	5.2	0	0	0
Leather	0.6	1.7	192	230	-37
Forestry	5.6	11.8	0	42	-42
Mining	1.3	2.6	661	933	-271
Textiles	1.4	2.3	0	309	-309
Grains	3.0	0.5	-421	-7	-415
Other Manufactured	1.5	1.8	0	434	-434
Meats	0.6	1.9	-142	324	-467
Wood, paper	11.4	2.6	0	519	-519
Clothing	1.2	2.6	0	622	-622
Other Agriculture	0.3	2.4	-183	758	-941
Beverages	1.5	2.5	-530	555	-1084
Electronics	2.8	2.5	0	2194	-2194
Chemicals	2.7	2.7	0	3049	-3049
Processed Foods	1.6	3.0	-2256	3736	-5992
Non-Ferrous	3.9	3.1	-5322	2149	-7471
Total	**3.3**	**2.8**	**29057**	**25859**	**3198**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.14: Estimation of the impact of the EU-Chile agreement for Ireland

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	1.9	1.8	10843	3454	7389
Cattle	10.2	4.4	0	-67	67
Mining	0.6	0.7	312	259	52
Refineries	0.5	2.1	225	206	19
Dairy	5.8	1.5	0	0	0
Fisheries	4.6	0.7	0	0	0
Forestry	1.0	0.9	0	3	-3
Leather	0.4	1.1	126	148	-22
Grains	0.4	1.4	-60	-17	-43
Steel	0.3	0.9	189	291	-102
Textiles	0.6	1.5	0	191	-191
Other Manufactured	1.2	1.0	0	236	-236
Motor Vehicles	0.2	1.2	646	931	-284
Clothing	0.8	1.6	0	391	-391
Wood, paper	3.7	2.1	0	417	-417
Other Agriculture	0.7	1.1	-476	363	-839
Beverages	2.7	2.6	-988	582	-1570
Non-Ferrous	0.7	1.3	-965	883	-1849
Meats	6.9	1.6	-1707	274	-1981
Chemicals	7.9	2.1	0	2407	-2407
Electronics	4.3	6.8	0	5936	-5936
Processed Foods	3.6	2.3	-5117	2901	-8017
Total	**3.0**	**2.3**	**3028**	**19790**	**-16762**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.15: Estimation of the impact of the EU-Chile agreement for Denmark

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	1.7	3.3	9894	6115	3779
Mining	4.6	0.6	2366	204	2162
Refineries	1.8	2.3	848	229	619
Motor Vehicles	0.5	1.2	1437	965	472
Leather	0.9	1.9	304	253	51
Cattle	3.0	1.8	0	-28	28
Dairy	6.6	1.7	0	0	0
Fisheries	22.8	14.3	0	0	0
Forestry	3.5	1.8	0	6	-6
Textiles	2.7	2.6	0	348	-348
Steel	1.0	3.7	694	1120	-426
Grains	3.7	1.8	-516	-23	-493
Wood, paper	1.8	3.4	0	677	-677
Clothing	3.7	3.0	0	717	-717
Beverages	1.6	2.3	-576	520	-1097
Other Manufactured	0.3	4.8	0	1138	-1138
Chemicals	2.1	2.0	0	2251	-2251
Electronics	1.0	2.7	0	2340	-2340
Other Agriculture	2.5	2.3	-1637	721	-2358
Meats	17.3	2.1	-4281	359	-4640
Non-Ferrous	2.9	2.4	-3996	1661	-5656
Processed Foods	6.2	4.1	-8740	5106	-13846
Total	**2.1**	**2.5**	**-4202**	**24680**	**-28882**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.16: Estimation of the impact of the EU-Chile agreement for Greece

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	2.2	1.3	12829	2508	10322
Refineries	2.4	1.3	1174	135	1040
Mining	2.3	2.3	1191	839	351
Leather	0.9	1.6	301	211	90
Cattle	3.5	2.0	0	-30	30
Dairy	0.6	3.0	0	0	0
Fisheries	5.4	1.4	0	0	0
Forestry	0.0	1.1	0	4	-4
Steel	0.6	1.5	379	457	-79
Grains	0.9	3.6	-132	-46	-86
Textiles	1.3	1.5	0	204	-204
Other Manufactured	22.0	1.1	0	263	-263
Wood, paper	0.2	1.3	0	270	-270
Clothing	2.0	1.5	0	355	-355
Meats	0.2	2.9	-44	484	-528
Motor Vehicles	0.0	0.9	131	679	-548
Electronics	9.8	0.7	0	618	-618
Beverages	0.7	1.9	-263	421	-684
Chemicals	0.3	1.3	0	1485	-1485
Non-Ferrous	0.8	1.1	-1037	747	-1785
Other Agriculture	3.1	1.1	-2003	362	-2366
Processed Foods	1.5	1.4	-2110	1818	-3928
Total	**2.6**	**1.3**	**10414**	**11782**	**-1368**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.17: Estimation of the impact of the EU-Chile agreement for Finland

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Other Machinery	2.1	1.8	12256	3350	8905
Steel	3.0	2.0	1985	615	1371
Refineries	3.0	2.0	1452	198	1255
Motor Vehicles	0.6	1.0	1849	800	1048
Leather	0.5	0.8	157	112	45
Cattle	4.7	1.2	0	-19	19
Dairy	1.3	0.7	0	0	0
Fisheries	0.1	0.7	0	0	0
Forestry	3.1	13.2	0	46	-46
Textiles	0.6	1.1	0	149	-149
Meats	0.4	0.4	-96	64	-160
Grains	1.3	0.4	-181	-5	-176
Wood, paper	11.6	1.2	0	249	-249
Clothing	0.5	1.2	0	281	-281
Other Manufactured	0.5	1.2	0	284	-284
Beverages	0.3	1.1	-126	245	-371
Other Agriculture	0.1	1.2	-34	379	-413
Mining	0.3	2.2	148	811	-663
Electronics	3.3	1.7	0	1460	-1460
Chemicals	1.0	1.4	0	1559	-1559
Processed Foods	0.5	1.3	-701	1638	-2339
Non-Ferrous	1.9	1.3	-2540	915	-3455
Total	**2.0**	**1.5**	**14170**	**13130**	**1040**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.18: Estimation of the impact of the EU-Chile agreement for Portugal

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Motor Vehicles	1.4	2.3	4317	1809	2509
Leather	5.2	2.7	1731	358	1373
Other Machinery	0.6	1.5	3597	2788	810
Refineries	0.7	2.1	338	213	125
Grains	0.3	7.2	-40	-91	51
Cattle	0.6	2.3	0	-35	35
Dairy	0.7	2.0	0	0	0
Fisheries	2.1	2.9	0	0	0
Forestry	5.0	6.2	0	22	-22
Other Manufactured	0.4	1.1	0	255	-255
Clothing	4.6	1.3	0	304	-304
Steel	0.5	2.2	363	675	-312
Wood, paper	2.3	1.8	0	352	-352
Meats	0.2	2.3	-44	393	-436
Mining	0.4	1.8	209	646	-437
Textiles	4.7	3.4	0	447	-447
Electronics	0.7	1.1	0	991	-991
Beverages	1.8	1.6	-658	358	-1016
Other Agriculture	0.6	2.0	-397	648	-1045
Chemicals	0.7	1.7	0	1897	-1897
Non-Ferrous	1.0	1.6	-1418	1114	-2533
Processed Foods	1.1	2.8	-1495	3526	-5021
Total	**1.1**	**1.8**	**6504**	**16668**	**-10164**

GTAP simulations. Source: Comext. Calculations: Planistat.

Table 16.19: Estimation of the impact of the EU-Chile agreement for Luxembourg

Sector	Share in EU exports (%)	Share in EU imports (%)	Evolution in thousand euro		
			Exports	Imports	Commercial balance
Steel	2.7	1.8	1820	545	1276
Other Machinery	0.2	0.4	1175	749	426
Cattle	0.3	0.2	0	-3	3
Dairy	0.7	0.8	0	0	0
Fisheries	0.1	0.4	0	0	0
Forestry	0.8	0.5	0	2	-2
Grains	0.1	0.2	-10	-2	-8
Leather	0.0	0.2	13	24	-11
Mining	0.0	0.1	21	46	-25
Textiles	0.6	0.3	0	34	-34
Motor Vehicles	0.1	0.4	288	322	-34
Other Manufactured	0.1	0.3	0	60	-60
Wood, paper	0.3	0.4	0	88	-88
Clothing	0.3	0.4	0	90	-90
Refineries	0.0	1.1	6	114	-108
Meats	0.1	0.5	-34	82	-117
Other Agriculture	0.1	0.4	-77	127	-204
Beverages	0.6	1.4	-215	318	-532
Chemicals	0.3	0.5	0	559	-559
Electronics	1.1	0.8	0	686	-686
Processed Foods	0.2	0.4	-242	525	-767
Non-Ferrous	0.5	0.5	-650	344	-995
Total	**0.4**	**0.5**	**2095**	**4708**	**-2613**

GTAP simulations. Source: Comext. Calculations: Planistat.

17. Summary of Social Impacts

This Section presents a summary analysis of the social impacts based on the sector studies in the context of the trade agreement. It examines the breakdown into agriculture, industry and services and discusses the impact on gender, indigenous people, employment quality and other related social issues.

By their very nature, trade agreements focus on commercial policy and social issues are relegated to a secondary role. The improvement of social conditions is an integral part of sustainable development and therefore social equality, respect for indigenous cultures, workers' rights, and gender issues need to be taken into consideration.

17.1 Summary by Sector

Agriculture and Forestry

Agriculture and forestry exports have increased considerably during the past decade and have shown a degree of diversification. Exports to the EU have more than doubled during the past decade, growing at an average of 7 percent per year. Exports to Mercosur also have doubled during this period.

Forestry has been one of the most dynamic sectors. Forestry exports are second in importance to copper. The forestry sector has grown at a rate of 9 percent annually over the past ten years. Approximately 61 percent of output is exported. Pulp and paper are the main source of foreign exchange and Japan and the Europe are the main destinations.

The forestry industry provides about a tenth of Chile's export earnings. But forestry firms are near Mapuche communities. The Mapuche are the largest indigenous group, about one million, among Chile's 15 million people. 44% of Mapuche live in the capital Santiago, where they represent approximately 10% of the population. 15% of Mapuche live in the Araucanía Region (the heartland of Mapuche territory), where they make up 26% of the total regional population, the highest concentration in Chile. Another 20% of Mapuche live in the adjacent Region of the Lakes and BioBio Region[81].

The Mapuche feel they are amid encroaching development of loggers. The forestry firms also employ few locals. Land shortages have forced many Mapuches to the cities, where they tend to get menial, low-paying jobs. The Mapuches have quarrelled with the forestry companies and the government has had to step in but these local issues are still under consultation and negotiation.

Agriculture in Latin America used to provide a major share of foreign exchange earnings but this contribution has declined substantially in recent years. Chile has been the exception, where the share of agriculture in total export earnings has risen. Subsistence crops by peasant farmers have grown but at a much lower rate than export crops produced by the commercial farm sector.

Non-traditional agriculture and forestry have displaced traditional farming activities in the last decade. More intensive use of agricultural methods has required greater investment and this has increased labour productivity. Increasing the maximum area of agricultural land has been facilitated and opened the way for a more dynamic but less protected land market (or land concentration). A favourable economic climate has encouraged a gradual

[81] Parra-Jerez C., Chilean Government to Make it All Better for Mapuche, tp://www.xs4all.nl/~rehue/art/perez2.html.

increase in agricultural investment. There is also increased spending on land improvement and investment in machinery and equipment.

Commercial farms have shifted to higher value added crops, have capitalised them through land improvements, increased irrigation, upgrading infrastructure and mechanization. Growth in output was achieved by an increase in productivity of the factors of production; the diffusion of capital intensive technologies and the extension of services to commercial farmers has widen the gap between modern agriculture and the peasant economy.

In recent years there have been important changes in the composition of the labour force: the growth of temporary and seasonal labour and incorporation of women in the labour force. This is due to the expansion of agro-industries that export seasonal fruit and vegetables. Temporary workers are usually paid by piece rate, are usually not entitled to social security benefits and have no employment protection. This is partly due to regressive labour legislation. The rapid expansion of exports of fruits, vegetables and flowers has also opened employment opportunities for women. Female workers tend to be more readily available, can accept lower wages, are less organized into unions and are better at handling activities that require careful packing.

Because of Chile's success in fruit exports, more jobs have been created, which mostly go to women in the processed food sector. It is estimated that 70% of temporary workers in the fruit export sector are women, employed mainly in fruit-packing plants. But this line of production poses significant health related hazards. Although there is a greater incorporation of women in the labour force, this does not imply that gender relations have considerably changed. The expansion of non-traditional exports has also increased health and environmental costs because of the use of chemical fertilizers, pesticides, and herbicides that create health hazards. If workers continue to be exposed to these conditions, the social effects are loss of income due to illness, long-term health complications, and disruption of family due to disability.

The effects of changes brought about by the trade agreement on the labour market are difficult to assess. First, a significant segment of the labour force in agriculture works on a temporary basis. Second, statistics on rural areas are not always reliable. Impact on labour markets will be varied according to the type of activity. Labour markets in agriculture are temporary, unspecialised and irregular with uneven wages. However, for certain agricultural activities, there might be important increases in real wages related to the growth of the sector.

A trade agreement that results in the acceleration of business would have the twin effects of providing more employment through investment and growth but would also mean that the number of people working without a safety net would increase.

The central projection is for forest production not to increase significantly as a result of the EU-Chile trade agreement. However, if logging does increase, the result could be to exacerbate the problems faced by indigenous people, who in many cases have lost access to their land, had their communities broken apart and have had their social networks disrupted. Government help has not replaced these networks.

Fishing

Relying on an immense Pacific coastline, Chile has had one of the fastest growing fishing industries in the world during the past two decades. While there has been a decrease in the catch since the industry reached its peak 15 years ago, fishing is still an important source of export. The lower catch is due to over-fishing and to the so-called El Niño environmental phenomenon. In spite of this, there has been a persistence to increase fishing efforts and

the levels of catch. This is in part due to increases in prices for the main fish in demand and to meet export commitments.

Fishmeal and fish oil are the industry's major exports. One of the main social concerns is that artisanal fisheries in some localities could be affected by the agreement, although an overall increase in sector employment is expected. Artisanal fishing only represents 9 percent of total landing but they are the main suppliers of the domestic seafood market. Any adverse effect on artisanal fishing would not only affect the well-being of fishermen and their families, it could create another group of displaced workers that migrate to cities in search of employment in the informal sector.

The fisheries sector is regulated to protect fish stocks and water contamination. The industry is vulnerable to period climatic changes known as El Nino phenomenon. Increasing concerns about the depletion of fish stocks have resulted in measures taken to bar or close certain fishing areas and quotas have been set on specific species. This is bound to have an effect on employment as fishing becomes a seasonal task and will remain a challenge to sustainable development.

Fishing is a labour-intensive activity and the industry employs mainly men. Few women in this sector are in food processing plants. Little information is available about the working conditions in these plants.

Mining

Mining is considered to have a stable output as a result of the EU-trade agreement. Mining is no longer a labour-intensive activity. Even if foreign ownership makes changes in production techniques, it will not significantly affect employment. In fact, new techniques will be labour saving. However, new techniques could lead to improvements in labour safety concerns. But new technologies will result in loss of jobs for those now working in the industry.

Services

It is estimated that almost 70 percent of the workforce in 2000 were in the services sector, including construction. Women account for over 40 percent of the employed workforce in services compared with 30 percent for the economy as a whole. Female employment is greatest in community and personal services where the figure is 55%, in wholesale and retail trade as well as restaurants, females comprise 45 percent of those employed. However, in construction only 2 percent are women, 11 percent of those in agriculture, and 27% of those in manufacturing.

During the past decade social expenditures have increased, particularly in health and education but expenditures in social security have experienced a relative slowdown compared to other sectors. While there have been increases in social expenditure, these expenditures as a percentage of the GDP has increased only slightly.

Expenditures on health and education have had a progressive effect. Indices for primary school enrolment are high. As mortality rates have continued to decrease, life expectancy has increased. Improvements of social indicators (as part of the human development index) are not due solely to economic growth but to an active social policy program (e.g. extension of potable water and sewage systems, expanded access of educational services, immunization and greater delivery of health services, modifications in reproductive behaviour).

The services growth engendered by the EU-Chile trade agreement is not expected to have a significant social impact. The main potential social impact

derives from the increased employment expected in services sectors. This might exert a 'pull' effect, attracting migrants to urban areas, where most services jobs are located. The smaller loss of employment in some manufacturing sectors is expected to diminish the 'pull' effect from services employment growth.

Nevertheless, increased migration to urban areas is a potential outcome of the EU-Chile agreement, although it is more likely to come from 'push' factors, notably the existing trends to lower employment, notably in agriculture and mining, which are projected to be supported by the EU-Chile agreement.

Migration to urban areas can place municipal and social services under strain. In general, although social conditions have improved, they are still not satisfactory because there are segments of the population living in conditions of poverty. Moreover, the quality and coverage of social services has also not evolved as expected. As social provision tends to be better in urban than in rural areas, the impact of increased migration to urban areas on the quality of social services as received by the population is likely to be minimal overall. However, this projection is subject to considerable uncertainty.

Finally, social inequality has been a recurrent issue in Chile's style of development.

Manufacturing industry

The manufacturing industry accounted for 17.4 percent of Chile's GDP in 2000.

a) Processed foods

The processed foods sector accounts for 8.4 percent of the industry. The share of total exports for this sector was 9.4 percent and the EU accounted for 22.4 percent of these exports. Canned fish and frozen fish as well as canned and processed fruits are the two most dynamic sectors.

Approximately 33 percent of the labour force in processed foods are female workers. The average wage for females is about 10 percent less than for their male counterparts. In this sense, females are still unevenly compensated. Employment in this sector consists mainly of relatively skilled workers because export products require higher quality standards.

b) Chemical industry

The chemical industry represents 3 percent of Chile's GDP and has shown a trend toward increased production. An important feature of this sector is the high volume of imports. Approximately 29 percent of chemicals imported are from the EU.

This sector employs mainly skilled workers. Female employment in this sector is only 25 percent of the work force. However, wages in this sector are far more attractive for women because they earn 8 percent more than their average male counterparts. It is expected that as production is likely to increase, so will be the hiring of both skilled and unskilled workers.

c) Non-Ferrous metals

The Non-ferrous metals sector (excluding copper) accounts for only 1.3 percent of GDP. The industry is an important supplier of inputs to the domestic market but also 37.5 percent of its exports are destined for Europe. Much of the labour employed in this industry is qualified labour and about 95 percent is male. The share of employment in this sector has been diminishing mainly due to increased automation. Employment in this sector is not expected to increase substantially, although the share of skilled labour is in the upswing.

17.2 Assessment of social policies

Within Latin America, Chile has maintained a relatively active social policy. Public spending on social programs has been more pronounced than in a number of other countries, particularly in the last decade. In terms of social indicators reflecting human development, relative to most countries in Latin America, Chile has shown substantial improvements. For instance, mortality rates have continued to decrease while life expectancy is higher than in most countries of the region. Substantial improvements have also been made in primary, secondary, and tertiary gross enrolment ratios of education. But these improvements are not solely due to economic growth but to an active social policy program on the part of the government.

During the past decade the Chilean economy has posted respectable levels of growth, the unemployment rate has been reduced, the volume and value of exports has increased, and investment has risen. In this sense, the Chilean economy has been heralded as a dynamic economy and a successful example of economic liberalization and free trade.

In spite of such efforts, the state's actions have not been sufficient to attend the needs of the poorest sectors of the population. In spite of improvements in coverage there are still unsatisfied demand for health care, there is a housing shortage and a segment of the population that is still marginalized from social benefits. In fact, social inequality has been a recurrent issue in Chile's style of development, which relies on market forces.

Another concern with the Chilean model is the growing concentration of income and wealth, the transition from small farms to large estates, the concentration of women in lower paying jobs, the lack of representation and labour organization particularly among women and indigenous groups. Women are still concentrated in services and a few other sectors that absorb the less qualified. They are in jobs that are not socially well recognized and are still not entirely protected by labour legislation. Unemployment levels tend to be higher for women than for men. Unemployment for indigenous groups is also higher than the national average.

While the level of female participation in the labour force has increased and now stands at about 35 percent of the total number of workers, the level of female labour participation in Chile is still low relative to other countries. Whenever unemployment figures rise, it is female unemployment that rises faster. The concentration in services is greatest in personal and household services (23.3 percent), social and community services (18.4 percent), retail trade (18.2 percent), and textiles and clothing (9.1 percent). These types of jobs are underpaid and are usually less protected under the law. In sum, women jobs are concentrated in low wage sectors, have scarce productive value, are more vulnerable during times of crisis and have less protection under current labour legislation.

Ethnic questions have become increasingly important because rural poverty remains and indigenous communities still face discrimination. In spite of Chile's economic growth, an important segment of the indigenous population lives in conditions of poverty and marginality. Social indicators for the indigenous population are below the national average. Their vulnerability has stimulated the design and implementation of social policies on the part of the government.

The indigenous population face a number of problems:

- They have been left behind by the improvements in health and education and face deteriorating living conditions.
- They face land and water disputes due to land divisions, expropriation, fraudulent sales, rentals, and others.

- There is a process of migration from their communities to urban centres in search of employment opportunities.
- They face higher levels of unemployment due to their lack of training.
- They have access to the school system but these are of lower quality than the national average.
- They have limited access to the judicial system.

Reflecting Chile's dynamic growth and market liberalization a privatised social security system was put in place to replace the old public system. But the new system rests on a long and progressive social security system that had been around since the 1920s. The old system was based on the combined contributions by workers, employers and the government. The new system is now essentially the only form of providing for retirement. In spite of its growth in coverage, there are shortcomings with the new system. For instance, many working people are never able to pay for the minimum retirement income. Another issue is the risk in retirement funds because they might be decimated by market fluctuations. The biggest problem is that the number of people affiliated has steadily increased, but less than half pay regularly into the system. For instance, Chile's most dynamic and labour intensive industries, fruit, forestry, and fishing, have seasonal labour demand. Working people with low wages and irregular work have little incentive to contribute to the retirement fund. Women are particularly vulnerable because they work in the lowest paying jobs and periodically withdraw from the labour force to care for children. Furthermore, the average retirement benefit paid to women is much lower than that paid to men.

It is estimated that of three workers with employment in Chile, only one has a labour contract, the second is under a precarious private system without automatic health benefits, and the third has no coverage at all.

Social costs of the Chilean model have been high. The burden of the model has been placed on labour and the lowest-income groups who suffer higher levels of unemployment and cuts in social services. Reducing the levels of poverty has been the objective since the early 1990s. Social policies have been enacted to address this problem. Despite increases in social spending there are segments of the population still living in conditions of poverty. The coverage and quality of social services has not evolved along with the public resources invested.

18. Summary of Environmental Impacts

18.1 Introduction

Environmental impacts of international trade have become customarily decomposed into *composition*, *scale* and *technique* effects, following the study of Grosman and Krueger in the early nineties on NAFTA[82]. As the impact of the trade agreement on EU output is spread across many sectors and countries, as discussed in Section 16, only the Chilean side is investigated in this section. Much of the analysis of the environmental issues related to the trade agreement between EU and Chile concerns their possible *scale* and *technique effects*; although *composition* effects, when the country composition of pollution production changes as a result of a trade agreement, are dealt with below.

This Section is partly based on results obtained from the computable general equilibrium modelling exercise, the *GTAP simulation*, on the projected economic impact sector by sector of the agreement, which is presented in Section 9. The sectors and groups of sectors dealt with here are agriculture, fishing, food processing industries, forestry, mining, selected manufacturing industries, electricity production and transport. Firstly, the relevant elements in the pre-existing situation are briefly explained. Secondly the estimated economic effects of the agreement are summarised. Based on these elements, a summary discussion of the potential environment impacts is presented.

18.2 Agriculture and related food processing industries

Pre-existing situation

Despite the decrease of its share in Chilean GDP from 8% to 5.9% over the last decade, the agriculture sector's average annual growth was positive, at around 1.5% during the 1990-2000 period. The economy grew around 6.7% in the same period. The value of goods produced in the sector grew similarly to the nation's growth, at around 3%, during the second half of the nineties.

Agriculture sector groups several products that have not developed at similar rates in the last decade. Seeded surface areas of grains have slightly decreased over the last years but remain by far the largest surface area dedicated to agriculture, especially wheat. In recent years, the export-led policy has been concentrating upon non-traditional agriculture exports, such as fruits.

Trade agreements and economic simulation

The results from the GTAP simulations show that the *Grains* and *Other agriculture* sectors are expected to grow by 2.21% and 1.89% respectively as a result of the E.U.-Chile agreement. The growth pattern of agriculture sector for the past decade was about 1.5% annual growth between 1990 and 2000 (annual GDP growth for the same period was 6.7%) while output of the *Grains* sector has decreased in recent years.

On this analysis, we consider that the increased output of *Grains* will be delivered to final consumption within Chile as well as to the sectors *Other Agriculture*, such as bird and animal rearing, and *Food Processing*, both of which are export-oriented. In 2000, processed foods represented almost 10% of the total value of Chilean exports and EU was their primary destination.

[82] - See Section 25.3, paragraph on *General equilibrium linkages between international trade and environment*) about Nordström H. and Vaughan S., *Trade and environment*, World Trade Organization (WTO), Special Issue N° 4, Geneva, 1999.

The GTAP simulation projects respectively a 1.25% and 3.35% rise in the *Processed foods* and *Beverages and tobacco* productions.

Environmental impact

Agriculture production in Chile has usually required lower rates of pesticides compared with other countries, due to some natural advantages for controlling diseases. However, in under 15 years the use of agrochemical products have tripled. Largely as a result of the recent development of non-traditional agriculture exports, mostly fruit, an increase of toxic substances has taken place. Another related problem caused by the increase of agriculture has been the salinisation of soil, due to the higher intensity in the use of water for agriculture irrigation.

The second issue of concern is the erosion and loss of agriculture soil because of bad management and agriculture practices. Indeed, one of the most direct environmental impacts of agriculture is soil degradation.

The expected increase in demand for agricultural products is very likely to be met thanks to more intensive methods. Therefore, the *scale effect* could be translated into higher extensive use of agro-chemical inputs. However, there is a governmental programme that aims at regulating and monitoring the use of pesticides in agriculture (*Chilean Agriculture Agency*, SAG). More intensive agricultural techniques, especially for grain production, could mean more soil erosion but the problem of soil erosion is not only caused by intensive agriculture. Basic technologies in agriculture such as continuous displacements have contributed to the erosion of vast areas of land.

On the other hand, in the context of intensifying methods, an increase in agricultural output is not expected to place pressure on land occupation. No significant incorporation of marginal lands or forestlands into commercial agriculture should be expected.

Agricultural output in Chile is mostly delivered to the domestic food processing industry, which is rather export-oriented. Therefore, the expected increase in Chilean processed food expected from the EU-Chile trade agreement is like to result in higher environmental pressures resulting from a *scale effect*. After the opening of the Chilean economy in the mid-eighties, most of the additional polluting discharges in the food processing industry were related to exporting activities.

18.3 Fishing and related food processing industries

Pre-existing situation

With 4 500 kilometres of coastline, Chile's fishing industry has a great potential for the country. Indeed, Chile has enjoyed one of the largest and fastest growing fishing industries in the world over recent decades. The fishing sector has increased its share of national income, partly due to the trend of increasing prices. Peaks in the catch were attained respectively in 1986 and 1995 in the centre-south and north zones. However, since the mid-eighties, Chilean main fishing resources have experienced increasing levels of scarcity.

As in agriculture, the production of fishing is largely used in the export-oriented food processing industry. Most fishing companies are vertically integrated, managing fishing fleets and processing plants. Chile has the second largest share of the world market in fishmeal. Together with Peru, the two countries supply about half of the world's production and 70 percent of the world's exports of fishmeal. In the 1990s, fishmeal production averaged 1.3 million metric tons annually, of which about 1 million tons were exported.

Trade agreement and economic simulation

The GTAP simulation projects a 1.69% rise of fishing output by value. Also 3.35% growth is projected for the food processing industry, which absorbs a significant share of the production of the fishing industry.

Environmental impact

Past mechanisation led to increased pressure on fish stocks. In recent years, policing of quotas has improved and current market based proposals aim at doing this further. If the measures being taken to protect fish stocks are effective, then the EU-Chile trade agreement will indeed have no impact on fish stocks. If, on the other hand, a failure of the regulatory system were to occur, then the increased demand brought about by the tariff reductions would increase the incentive to fishermen to evade the quotas. The competitive pressures brought about by increased investment in the industry, either by domestic or EU owners, might have a similar effect.

Fishing industry is also concerned with another environmental issue: the contamination of water by organic waste realised from fishing vessels when landing and operating first transformation of fish. Here again, we can fear a negative environmental impact resulting from a *scale effect*. However, water contamination varies greatly across companies, depending on the on the technology. The item on investment in the agreement may then help to implement the use of the cleanest equipment available and cancelling, at least partly, the above-mentioned scale effect.

Air pollution, as well as odours, is also a serious problem in fish processing but no data are available in Chile.

18.4 Forestry and related wood processing industries

Pre-existing situation

The forestry sector is a small sector, contributing only about 3% of Chile's GDP, but is one of the most dynamic sectors in the Chilean economy: During the 1984-92 period, the sector's average annual growth of 9% was substantially better than the 7% growth for the economy as a whole, thanks partly to the upward trends of sector product prices during the late eighties-early nineties, which went up fourfold between 1984 and 1996. More than half of production is exported.

However in the recent period from 1997 to 2000, prices in the sector rose by only around 3%. This slowdown was mainly caused by the downward trends of international prices for the main export products.

Agreement and economic simulation

According to the GTAP simulation the Forestry sector should grow 0.52% due to the EU-Chile agreement and the Wood, Pulp and Paper sector by 0.79%. In contrast, the growth pattern of Forestry sector for the past decade was 1.81% annual growth between 1990 and 2000.

Environmental impact

Environmental concerns can be divided into those related to the sustainable management of the forest and those associated with wood processing. The pulp and paper industry only uses wood from plantation as a source. There is no exploitation of native forest and the latter are not strongly replaced by plantations (about 5-10% between 1962 and 1990). Therefore, no environmental negative scale effect should be feared as far as conservation of native forests is concerned, although plantations can have a negative impact

on bio-diversity, since chemicals used to control pests on plantations can be harmful to other species.

On the other hand, positive effects could be expected from plantations on soil erosion and climate change. The impact of new plantations on soil erosion depends on the change in land use as well as on local variables, but in general, either when established on former barren lands or replacing other crops, the impact on soils is likely to be positive. Finally, although carbon storage into biomass is still a controversial issue, we can expect that forest plantations can help the fight against climate change by capturing carbon dioxide (CO_2).

Environmental effects from pulp and paper production include water pollution through liquid effluents such as chemicals and fibres, odours from the use of certain chemical substances and air pollution from combustion of fuel for drying purposes. Discharges into waterways include solids composed of dirt, grit, fibre and additives. Environmental problems related to these sediments include increasing water turbidity, interference with aquatic plants and animals and clogging of streambeds. The organic content stimulates alga growth and exhausts dissolved oxygen. Air pollutants include marcaptanes and sulphurous compounds emitted during the pulping process, as well as particulate matter from combustion processes. Finally, like fish processing, odours are major sources of disturbance from pulp and paper factories.

However, environmental impacts vary greatly between factories. Export-oriented enterprises in the industry have adopted more environmentally friendly production technologies than those supplying the domestic market, partly due to EU sector process regulations. International market competition provides incentives pushing firms to decrease production costs by investing in the latest environmental technologies, such as closed cycles for emissions and effluents and self-sufficient energy generation systems. In the context of the EU-Chile trade agreement, it is possible to expect the *technique effect* playing its role and, at least partially, balancing the above-mentioned *scale effect*.

18.5 Mining

Pre-existing situation

Chile is a fundamental actor in international mining. It possesses one of the largest mining zones of the world, with more than 25% of the world reserves of copper. It is the leader in the production of sodium nitrate and potassium nitrate; it has the largest reserves of selenium and rhenium and is the second world producer of lithium, molybdenum and iodine. Mining is the most important exporting activity in Chile, representing 37% of total exports in 2000, with copper accounting for 30% of shipments. The sector accounted for 7.4% of GDP in 2000. Although Chilean mineral exports to EU have dramatically fallen by 24% from 1995 to 2001, EU represents their main destination with almost 30% of the total.

Following the resulting negative *environmental scale effect* in the early nineties, large mining companies of the country, covering copper, gold, silver, iron, manganese and non-metallic mining, have implemented environmental management systems reflecting an increasing concern about environmental issues during the last decade. The government has also required stricter standards for air and water pollution and it is now discussing the issue of better closure and abandonment procedures. On the other hand, small-scale mining companies have not been yet involved in environmental management and has had very limited investment capacity to improve procedures.

Agreement and economic simulation

According to the GTAP simulations, the EU-Chile trade agreement could result in a slight increase of 0.36% in the production of the mining industry but with a reduction of 0.33% in its direct exports. The GTAP results in the non-ferrous metals (including both refining and smelting activities) sector indicate an increase in sector production of 2%.

Environmental impact

As in the nineties, the expected slight increase in mining production should result in higher pollution emissions to air and water. Although national environmental regulations that support investment in cleaner technologies should mitigate this small negative environmental scale effect, local environmental problems are likely to persist, especially regarding small and medium sized mines. However, final results on emissions are uncertain. There are also very likely to be negative effects on surface water availability, as well as underground water quality and quantity. Furthermore, the lack of strict closure and abandonment procedures may result in increasing waste problems and negative impacts on water quality.

18.6 Selected manufacturing industries

Chemical and non-ferrous metals productions, for which the GTAP simulation foresees a comparatively high positive output effect resulting from the EU-Chile trade agreement, are among the most harmful manufacturing industries as far as the environment is concerned. These two sectors are considered here. The food processing and wood related productions are earlier mentioned in relation with agriculture, fishing and forestry activities that produce their basic inputs.

Pre-existing situation

In 2000, the chemical industry represented 3% of the Chilean GDP. This sector significantly contributes to Chilean exports and is integrated into the international industry. Despite a deterioration of the international prices in the late nineties, exports of Chilean chemical products grew by 42% between 1995 and 2001. As far as the environment is concerned, this sector is responsible for the production of wastewater and solid waste, as well as emissions to air. Although the chemical sector signed a *Clean production Agreement* in September 1998, the *scale effect* has produced an increasing negative environmental impact in the recent years.

The Chilean non-ferrous metal industry is a net importer but more than a third of its exports, which represent 1.5% of total Chilean exports, is sold in the EU. Like the chemical industry, this sector experienced a dramatic rise of its exports (54%) during the second half of the nineties. As concerns the environment, a *scale effect* has also been translated into a recent increase in air emissions and waste production.

Trade agreement and economic simulation

Estimations of the GTAP model project that, as a result of the reduction of 100% of tariffs on sector products (and some sector products were indeed previously tariffed), the Chemical industry is expected to experience an increase of total production of 1.5%. The significant share of imported inputs and products in this sector, particularly from the EU, will result in a 3.6% increase in the imports of these products. The results of the simulation also consider a positive impact on physical exports that will increase by 10.8%.

The GTAP simulation indicates a 2% rise of non-ferrous metals production as a consequence of the EU-Chile trade agreement.

Environmental impact

Increase in the installed capacity, due to greater competitiveness in the chemical sector, should be translated in higher polluting emissions as result of the *scale effect*. Nevertheless, the environmental requirements, including voluntary actions relating to *Responsible Care and Voluntary Agreements*, plus the requirement of *Environmental Impact Assessments* for all new and expansion of projects, and the water standards for the sector, would mitigate the possible negative outcomes associated to the increase in production. New production should have lower emission intensities, but if growth in production is so high that there may be a negative net environmental effect.

The additional domestic production generated by an increase in exports of Chilean non-ferrous metal products is likely to generate negative environmental effects. However, recent environmental regulations together with a *technique effect* due to cleaner processes should dampen the *scale effect*. The final result on emissions is nonetheless uncertain.

18.7 Electricity production

Pre-existing situation

Up to 1997, Chilean electrical generation had been largely based on hydropower, up to 75% in 1992, and to a lesser extent, on thermal coal powered plants. However, a recent trend has been the incorporation of new combined cycle plants served by natural gas. As a result, thermoelectric power by natural gas represented 54% of total thermal generation in 2000 and coal based thermal plants have reduced their share in thermal generation from 92% in 1996 to 38% in 2000. Consequently, e.g. in the 2000 drought year, thermal generation accounted for 71% of total electric generation.

Chilean electrical markets were liberalized during the 1980s. The private sector has preferred thermal plants over hydro plants due to the high investments demanded for the construction of hydro plants and the long payback period required. For the next few years it is expected that one new hydro plant should be finalized and the rest of the additional capacity will be provided by thermal combined cycle natural gas plants.

Trade agreement and economic simulation

We expect an output increase in electricity demand as a result of the EU-Chile trade agreement of around 0.67%, as indicated in the sector analysis.

Considering that the total installed capacity of the electricity sector for 2000 was slightly over 10 300 MW, a 0.67% increase in this sector due to the EU-Chile trade liberalization requires installing an additional capacity of 70 MW. This would correspond to a part of a small or medium sized power plant that could be served by either a thermal plant running on natural gas or coal or a hydro power plant.

Environmental impact

A negative *environmental scale effect* is very likely, but the real environmental impact, in this case air emissions, will depend on the technique actually adopted. Additional electricity production capacity fulfilled by thermal plants running on natural gas would understate the negative environmental impact on air pollution. However, if coal is used or even petcoke (which is a very polluting fuel resulting from oil refining and that can serves as input of

coal thermal power plants), both local and global impacts may be seriously higher.

Hydropower electricity would have no impact on air pollution. Impacts would nonetheless appear on natural forests and bio-diversity. Finally, if the interconnection of electric lines with Argentina takes place, local environmental issues should disappear (transferring the responsibility for global air pollution to Argentina).

18.8 Services: Transport and Tourism

Pre-existing situation

The bus is the main mode used both for urban and interurban transport. However its proportion in total transport of passenger is decreasing, but replaced by private cars. Freight is mainly carried by trucks, which account for 86% of interurban cargo, while the rest is divided among trains, air cargo and ships.

Chilean transport sector has been very dynamic in the past decade. Transport and communications have grown more than 2.5 times between 1985 and 1998, and continues to grow strongly. The number of vehicles in Chile has increased from 1.1 million in 1990 (over 650,000 cars and station wagons) to over 2 million in 2000 (over 1.1 million cars and station wagons).

Agreement and economic simulation

The increase in economic activity is the key factor for the growth in transport sector. Higher economic growth will generate even higher demand for transport, both urban and interurban transport of passengers and freight.
The EU-Chile trade agreement is expected to boost the economic activity. Therefore, transport services, as well as own account transport of other industries and by private households, should stay on an upward trend.

Environmental impact

The transport related environmental issue is of course air pollution, the more so as Chileans are rather keen on spark-ignition engine transport means. In this case again, the negative environmental *scale effect* is rather obvious, but, this time, it is very likely to heavily overweigh the positive impact of the *technique effect*.

18.9 Composition effect

Most of the capital intensive sectors in which Chile is specialised - mining, food processing, chemicals and non- ferrous metals - are either actually or potentially harmful to the environment. For Chile, the GTAP modelling exercise says that the trade agreement with the EU should result in a reinforcement of the sectors in which it enjoys a comparative advantage. With the exception of the production of the grains sector, the expected positive impact on exports is highest for processed foods, chemicals, and, to a lesser extent, non-ferrous metals, which is closely linked to mining. EU exports in the same sectors are either negatively affected (processed food and non-ferrous metals) or very much less positively so than for Chile (chemicals).

In this context, if a *composition effect* appears it could impact on manufacturing industries. And, in the short term, it could be translated into higher pressure on the environment in Chile. Indeed, as shown in the sector studies, at least for food processing and chemical industries, the technique effect is unlikely to outweigh or neutralise the negative environmental scale effect resulting from the expected production rise following the agreement.

The theory predicts that the country where environmental standards concerning the “dirtiest industries” are highest has a positive outcome from such a composition effect. In order to benefit from the trade agreement in this way, Chile should continue engaging itself in the implementation of new regulations as it has recently done in the non-ferrous metals sector.

C. Final Synthesis

19. Implementation Stage 3: Assessment of Impacts

Table 19.1: Summary of sustainability impacts for Chile

	Dimensions / Significance Criteria					
Themes:	**Overall Direction magnitude** A	Existing con-ditions B	Equity: urban/ rural C1	Equity: gender C2	Revers-ibility D	Capacity to change E
I Economic						
1. Real income	△	△	▽			
2. Net fixed capital formation	△	△				
3. Employment	△		▽	△		△
3.1 Self-employment, informal employment	↕	▽	▽		▽	△
4. Consumer effects	△	△				
II Social						
5. Poverty	△	↕	▽	**?**		△
6. Health and education	↕	▽				△
III Environmental						
7. Environmental quality	▽	▽				△
7.1 Air quality indicators	▽	▽				△
7.2 Water quality indicators	▽	▽				△
7.3 Land quality indicators	▽	▽				△
8. Biological diversity	○					
8.1 Designated eco-systems	○				▽	
8.2 Endangered species	○					
9. Other natural resource stocks	▽	▼			**?**	△

For explanation of symbols, rows and columns, see below or Section 5.

Columns A – E

A. Overall direction and magnitude of change from baseline to scenario

B. Extent of existing economic, social and environmental stress in affected areas

C. Equity of change: how it affects different sectors of the population

D. Potential for irreversibility

E. Regulatory and institutional capacity to implement ameliorating measures

Column A is always completed. The other columns are completed as required to describe the sustainability impact.

Symbols:

- ○ non-significant impact compared with the base situation
- △ positive lesser significant impact (marginally significant, by itself, to the negotiation decision)
- ▽ negative lesser significant impact. (marginally significant, by itself, to the negotiation decision but a potential candidate for mitigation)
- ▲ positive greater significant impact (likely to be significant, by itself, to the negotiation decision)
- ▼ negative greater significant impact. (likely to be significant, by itself, to the negotiation decision. Merits serious consideration for mitigation)
- ↕ positive and negative impacts likely to be experienced according to context
- ? net effect is uncertain

19.1 Summary of sustainability impacts

Table 19.1 summarises the economic, social and environmental sustainability impacts we have identified as resulting directly or indirectly from the EU-Chile trade agreement. A more detailed description of the summary Table, its columns, rows and symbols and its links with sustainability indicators and significance criteria is given in Section 5.

19.1.1 The economic sustainability of the EU-Chile trade agreement

Overall, the impact of the EU-Chile Economic Partnership Agreement is to reinforce existing trends in Chile. The Agreement results in additional economic growth for Chile, equivalent to not more than a year's normal economic growth. This is the result of increased demand and some economic restructuring in favour of sectors in which Chile has a comparative advantage, such as processed foods, agriculture, wood, pulp and paper and chemicals. Sectors in which Chile has a comparative disadvantage are steel, motor vehicles and other machinery. These sectors lose employment, as does mining due to increased labour-saving investment. None of these employment losses are large; there is no evidence for any economic sustainability issues in Chile.

While the greatest per person economic gains are realised in Chile, the EU's gains are larger in absolute value. In the European Union, the increase in value or income is spread thinly over a large number of activities. The overall gain in real income is around $ 800 mn and no sector loses appreciably in any country.

The positive economic impact of the Agreement on the EU and its wide dispersion mean that no social and environmental sustainability analyses are required in the EU.

In both Chile and the EU, the Agreement will bring about a combination of increases in employment and a reduction in prices relative to wages.

While the economic gains from the EU-Chile Economic Partnership Agreement are relatively modest, they are fairly widely distributed across sectors and are welcome.

19.1.2 The social sustainability of the EU-Chile trade agreement

In Chile, the combination of increases in employment and a reduction in prices relative to wages will help to increase the standard of living and reduce poverty among the majority of the people living in urban areas.

On the other hand, there are a number of pre-existing socially unstable and perhaps unsustainable issues that will be affected by the EU-Chile trade agreement, although the trade agreement cannot be said to be the root cause of these situations. In most of these situations, the issues are related to the existence of a dual economy and to difficulties with fair and fully efficient regulation or with title to land.

Table 19.1 summarises the expected social sustainability impacts. The overall impact on employment is clearly positive. This does not preclude negative impacts that might be quite persistent in some circumstances. This is partly, though not wholly, due to sustainability problems that exist before the EU-Chile agreement.

The overall impact on employment means that urban opportunities for self-employment, including in the informal sector must be created. On the other hand, many small farmers face an existing sustainability crisis reinforced by increased investment and competition from large commercial farmers.

Poverty must be reduced by the additional employment but will be made worse in the areas where negative employment outcomes are expected.

In the area of health and education, there is no obvious impact of the EU-Chile agreement, direct or indirect.

In terms of overall equity, inclusion in the usual economic processes through employment will be an important step for many people. However, these opportunities will be limited for many people by the existing inequalities in terms of practical rights and access to social and economic opportunities. In some situations, such as small farming, artisanal fishing and forest-based Mapuches, there is a risk that their already precarious situation will be worsened. Women's access to employment, to capital, to land rights on equal terms is not yet universally achieved. While employment in some sectors where women are employed, such as food processing, will increase, no necessary change is created by the agreement to the pre-existing inequalities.

Indigenous peoples suffer from the same existing small farming problems as other people. Forest-using indigenous peoples consider that their lands are being encroached upon by increased commercial forestry, although the increase in forestry is expected to be modest. Depending on the electricity generating strategy chosen by Chile, they may or may not be negatively affected, although such a negative impact is not a necessary consequence of the EU-Chile agreement.

Without the EU-Chile trade agreement, the existing social problems will continue. While the agreement will not solve all of these problems, it will bring considerable social benefits to a large part of the population. The agreement will also bring opportunities to address some of the pre-existing social problems.

Social Sustainability: Agriculture

The trend to intensification of commercial agriculture is not fundamentally caused by the EU-Chile trade agreement but the agreement adds to it.

The Agreement will increase demand for agricultural produce. In the medium term this demand will be provided by the more economically efficient intensive farming methods as these lead to lower cost produce.

Increased productivity of commercial agriculture will mean that small farmers will be less able to market their surplus produce and so lead to their farms becoming economically unsustainable. There may be problems with title to land. In any case, there is unlikely to be a market for their farms.

The EU-Chile Agreement may help small farmers in the short term by increasing the demand for agricultural produce but in the medium term it will add to the existing trends of agricultural intensification. Both the present extent of small-scale farming and the probable long-term underemployment that many small farmers will face unless alternatives are found could be unsustainable.

As small-scale agriculture is the main occupation of the Mapuches, they are likely to be affected by these impacts.

Since there is a gender-based division of labour in small-scale agriculture, there is likely to be a gender-differentiated experience of the impacts in this sector.

Social Sustainability: Fisheries

The social issues in the fishing sector have existed prior to the EU-Chile Agreement but will be affected by it.

In fisheries, the overall impact of the EU-Chile trade agreement will be to add employment and investment to the industry.

However, the industrialised fishing sector will have greater market opportunities from lower tariffs and increased efficiency from new investment, either as a direct consequence of the admission of EU ownership of boats or as an indirect result of increased market opportunities.

To the limited extent that artisanal and commercial fisheries are in competition for the same stocks, where investment increases in commercial fishing-boats, these will become relatively more efficient compared to artisanal fisheries. However, artisanal fisheries will benefit from the tariff eliminations. Given the recent increase in the numbers of artisanal fishing-boats (Figure 13.4), it is possible that a negative employment effect will predominate for artisanal fishing. However, it must be stressed that a positive overall employment outcome is expected in the fishing sector.

It should be emphasised that reduction in artisanal fishing will occur with or without the EU-Chile trade agreement. In particular it is not necessarily linked to the introduction of EU ownership of boats. The overall increase in sector employment is expected to outweigh the loss of artisanal employment. Without the Agreement, much of the loss of artisanal fishing employment would still occur and the employment increase elsewhere in the sector would not occur.

While the sector employment perspective is positive, this does not mean that people who lose their jobs will be able to find new ones. Although artisanal and commercial fishing is concentrated in the same regions, geographical reasons mean that artisanal fishing communities could lose their source of employment without it being replaced. Local unemployment could persist for a considerable time.

19.1.3 The environmental sustainability of the EU-Chile trade agreement

Increased industrialisation and urbanisation implies negative scale effects that for air, water and land quality generally outweigh benefits from technique effects. Land and water quality are also affected negatively by agricultural intensification. For these indicators, some localised environmental improvements could occur from technique effects but we also note the

potential local seriousness of mine-induced pollution. Biological diversity impacts are largely a function of the electricity strategy chosen; a strategy that may cause such impacts is therefore not a necessary consequence of the EU-Chile trade agreement. Natural resource stocks, notably fishing stocks, depend on the effective implementation of appropriate management techniques.

In forestry, the environmental impact of the EU-Chile trade agreement is either uncertain or even possibly positive. However, most of the output of this sector is used as intermediate consumption of export-oriented manufacturing industries, for which the scale effect is likely to provoke increasing environmental pressures. Thanks to expected new investment, the technique effect should nonetheless be able to balance, at least partially, the scale effect. As concerns the mining industry, the technique effect is rather unlikely to cancel the negative environmental impact resulting from the scale effect.

Chemical and non-ferrous metals industries are heavily involved in the pressure operated on the environment, but companies are increasingly aware of the problem. However, despite voluntary engagements and new regulations, the environmental scale effect resulting from the EU-Chile agreement is likely to overweigh the expected technique effect.

Changes in the electricity production and in transport activities are positively linked to variations in the other economic activities. Positive economic affects expected from the EU-Chile agreement should firstly be translated into higher environmental pressure. Also, here again, the technique effect is rather unlikely to be able to cancel the scale effect, especially about transport. Since the main environmental issue related to electricity production consists in air emissions, improvement could come from the use of gas instead of coal. At a cost in terms of impact on bio-diversity, air pollution can be improved by producing hydro-power electricity. Increased electricity production as a consequence of the EU-Chile trade agreement need not lead to a significant sustainability impact on bio-diversity.

Environmental Sustainability: Agriculture

The major sustainability issues that affect the sector concern the intensification of commercial agriculture. This trend is not fundamentally caused by the EU-Chile trade agreement but the agreement adds to its effects. The consequences of the trade agreement clearly interact with existing trends to cause possible sustainability impacts.

As already noted, the Agreement will increase demand for agricultural produce. In the medium term this demand will be provided by the more economically efficient intensive farming methods as these lead to lower cost produce.

The environmental consequences of increased intensification of agriculture include potential sustainability impacts involving salinisation, chemical residues and erosion of the soil, although increased concentration of commercial farms and/or better management might have the opposite effect on erosion.

Environmental Sustainability: Fisheries

In the fishing industry, existing environmental threats come from over-fishing and from the environmental impacts of low-technology operators.

Past mechanisation led to increased pressure on fish stocks. In recent years, regulation has improved though this process is clearly not complete. If the measures that have been and are being taken to protect fish stocks are effective, then the EU-Chile trade agreement will indeed have no impact on fish stocks. If, on the other hand, a failure of the regulatory system were to

occur, then the increased demand brought about by the tariff reductions might increase the incentive to fishermen to evade the quotas. The competitive pressures brought about by increased investment in the industry, either by domestic or EU owners, might have a similar effect.

If the aquaculture sector exempt from quotas is going to grow as a consequence of the EU-Chile agreement, there may be a risk in salmon farming, of damage to the local marine environment, partly from pesticides pollution.

19.2 Causal Chain Analysis of Sustainability Impacts

The following text gives a summary causal chain analysis (methodology explained in Section 4) for the sustainability impacts noted in Table 19.1 and for a causal chain that did not result in a sustainability impact.

19.2.1 Real Income, Net fixed Capital, Employment and Consumer Effects in Chile

Real Income, Net fixed Capital and Employment in Chile is noted in lines 1, 2, 3 and 4 of Table 19.1 as a positive lesser significant improvement.

The trade measures as a whole lead in Chile to a moderate increase in concentration on sectors where the country has a comparative advantage. This leads to increased value in production and consumption, which in turn leads to increases in real incomes, real wages and / or structural increases in employment and an increase in the capital stock. All of these results are derived from the macroeconomic analysis.

19.2.2 Impacts to Self-Employment and Impacts to Equity in Employment and Real Income

The Equity of Real Income, Employment and Self-Employment changes and the overall change in self-employment and informal employment are shown in Line 1 Column C, Line 3.1, Column A and Lines 3 and 3.1, Column C.

Although the macroeconomic analysis shows structural improvements to employment, the sector level changes mean that frictional unemployment may occur as workers move from one sector to another. This is necessarily less than the overall impact on sector employment.

The assessment is based on the macroeconomic and sector analysis from the CGE model and on further sector employment analysis. In particular, these social sustainability impacts are derived from the analysis of the fishing and agricultural sectors. Both of these sectors are 'dual' sectors: two sub-sectors, one commercial capital-intensive and the other small-scale, labour-intensive and partly informal and non-marketed, co-exist.

In both Agriculture and Fishing, there is an increase in demand for the sector's products as a result of reduced tariffs on the products of the fishing, agricultural and related Processed Foods sectors. In both Agriculture and Fishing, this demand is met by the commercial sectors, as these sectors are able to adopt new more efficient capital-intensive methods and so are able to produce at lower prices than the small-scale sectors.

In the Fishing sector, the introduction of new investment and thus more efficient techniques (only partly through EU-owned fishing boats under the fishing agreement) will cause a similar increase in the competitive advantage of the commercial sector. Once again, the commercial sector will be able to produce at lower cost than the small-scale 'artisanal' fishing sector.

Note that in this situation, two different trade measures are considered to have qualitatively the same result.

In the above situations, the commercial sector out-competes the small-scale producers, who lose their source of employment or self-employment and thus lose real income. Although employment in the sectors may be increasing overall, which is the case of the fishing sector, unemployment persists among some of those formerly employed in small-scale production because the people who have lost their employment are in different locations without the means to access alternative employment.

Equity is also concerned because Mapuche Indians are among those affected in the agricultural sector.

This analysis should be seen as qualifying the overall positive employment sustainability assessment.

19.2.3 Impacts on Poverty

The overall improvement to employment / real wages above reduces poverty. However, the increase in unemployment in parts of the agriculture and fishing sectors, described above, will worsen poverty for many of those affected.

19.2.4 Impacts on Health and Education

No impacts on education have been observed and few on health.

19.2.5 Impacts on Environmental quality: air

In fishing (fish processing), food processing, chemicals, wood, paper and pulp, mining and non-ferrous metals, transport and electricity production, there is an increase in demand for the output of the sector, either from increased exports to the EU resulting from lower tariffs, or from increased demand from other sectors and from final consumption within Chile.

The increased demand leads to an increase in the scale of output of fish processing plants, other food processing plants, chemicals plants, mines and metal processing plants, urban road transport and electricity generating plant (depending on the production technology chosen).

The increased scale of production of these inherently polluting industries increases air pollution.

In the chemicals, wood, paper and pulp, mining and non-ferrous metals and electricity production sectors, the new investment implemented to provide the increased production is less polluting than the existing plant, some of which might be replaced. This is partly the result of new technologies and partly the result of pollution regulation. In the wood, paper and pulp sector, EU process regulations have to be adopted by importers to the EU.

This technology effect will counteract the scale effect but only in the Processed Food and Chemicals sectors might it outweigh the scale effect.

19.2.6 Impacts on Environmental quality: water

In fishing, food processing, chemicals, wood, paper and pulp, mining and non-ferrous metals, similar results hold for water pollution as held for air pollution.

While mining output is not expected to expand much or at all at a consequence of the EU-Chile agreement and any expansion is likely to benefit from a positive technology effect, some past mining activities have destroyed local clean water supplies.

19.2.7 Impacts on Environmental quality: land

In mining, agriculture and forestry, the demand effects noted above hold, although little output expansion is expected in mining.

In agriculture, the increased demand is met by increased supply though the application of more intensive farming methods as explained above. These

techniques include increased irrigation and application of fertilisers and other agricultural chemicals. Under certain soil conditions, the soil is unable to be purged of the saline build-ups from irrigation or the residues of the agric-chemicals, which leads to soil degradation. The misuse of intensive farming methods can also lead to soil erosion, though an improvement in erosion is possible in agriculture and forestry as a result of improved techniques. In the case of agriculture there result from increased consolidation and adoption of new techniques for the reasons given above.

In forestry, planting on previously marginal lands can actually improve land quality.

19.2.8 Impacts on Biological diversity

Past mechanisation led to increased pressure on fish stocks. In recent years, policing of quotas has improved and current market based proposals aim at doing this further. If the measures being taken to protect fish stocks are effective, then the EU-Chile trade agreement will indeed have no impact on fish stocks. If, on the other hand, a failure of the regulatory system were to occur, then the increased demand brought about by the tariff reductions would increase the incentive to fishermen to evade the quotas. The competitive pressures brought about by increased investment in the industry, either by domestic or EU owners, might have a similar effect.

19.2.9 Impacts on other natural resource stocks

The impact on the fisheries sector resources has been considered above in 'Environmental Sustainability'.

19.2.10 Textiles

This assessment is not shown in Table 19.1.

The trade agreement has eliminated tariffs on textiles and clothing between the EU and Chile. The macroeconomic analysis found little or no impact on sector output in Chile. No further study was undertaken.

19.3 Analysis of contradictory and incomplete information

Information largely came from two sources: the data in the GTAP database and the macroeconomic, microeconomic, sector and social data required for the sector studies.

Ultimately, all the macroeconomic data have originated from the same sources within Chile. However, they are presented on different definitions, notably different sector definitions. The sectors were defined for the GTAP analysis in order to ensure that sustainability impacts were not 'hidden'. This meant that the GTAP sector definitions were very different than those used by the Chilean Central Bank. This caused difficulties in sector analyses and, indeed, in presenting the sector results. It should be underlined that the data is not, in fact, contradictory.

A similar situation occurred with the definitions of skilled and unskilled labour. The GTAP definition is based (see Section 8) on an ILO definition. The data used by the sector studies used a Chilean definition. Both definitions are 'correct' in the context of appropriate use. Once again, the data is not, in fact, contradictory.

The main source of statistics on employment by gender was the ILO. This data must come from a Chilean source. Most of the important questions about economic and social activity by gender, especially in the sectors where produce is not fully marketed, could not be answered for lack of data or alternative relevant case studies.

20. Implementation Stage 4: Mitigation and Enhancement

Most if not all of the sustainability issues have been experienced in Chile for quite some time. Great efforts have been made to improve environmental quality. Because of this, especially concerning environmental sustainability, many of the structures for the mitigating (flanking) measures required already exist. In the cases where a consensus exists, there is usually a fully effective regulatory body.

The role of the EU in acting to mitigate the negative sustainability consequences of the EU-Chile agreement could therefore generally be seen as a participant and supporter of efforts already under way; as a source of support where new resources are required for research; and as a partner in a two-way EU-Chile mutual education dialogue in those situations where a consensus is still to be built within Chile.

It is perhaps not surprising that the sectors where the sustainability impacts have been most noted are those where there is competition for non-marketed resources: fishing and agriculture. Forestry and electricity generation could also be added to this list but these sectors are not closely linked with the EU-Chile agreement.

As the sustainability impacts are closely related to existing effects, the mitigating measures must address the underlying situation.

In developing the approach, an important question to be asked is why an existing regulation has not already been effectively addressed. Is this due to lack of resources, to a sub-optimal regulatory system or to a lack of consensus about objectives, leading to evasion of regulation.

The following mitigating measures cover the more important sustainability impacts and some cross-cutting issues. Other issues are considered in the detailed studies, sections 11-14.

20.1 Agriculture

- Current norms about pollution caused by pesticides in agriculture require reinforcement, as environmental standards can easily lose support in periods of low economic growth and high unemployment. Efforts could be orientated towards promotion of environmental production methods and soil conservation, as a means of entering high-value EU markets.
- Over the last decade, several programmes have been implemented in order to control and reverse the increasing soil degradation in the country. How effective have they been and how useful have been the existing subsidies and incentives? Support could be given for an examination of these programmes and their development based on existing good practice.
- The impact of agricultural intensification on the ability of small farmers to achieve a sustainable livelihood needs to be mitigated by ensuring that their existing assets and skills are valued and by opening new opportunities. Therefore a mitigating measure should take the form of helping small farming communities to establish their title (individually or collectively) to land where this is lacking. This is a very important measure toward limiting rural poverty, exploitation and rural exodus and to achieve a sustainable livelihood. Other mitigating measures include enabling small farmers to have access to new markets and to finance. Further flanking measures should address the acquisition of new skills. Since we think that the situation is different for men and women, differentiated approaches may be appropriate.

- Approaches to address the sustainability of small-scale agriculture need to combine an improvement in the conditions of rural production with a positive approach to urban migration. Improved title to land will enable small farmers to sell their land if necessary, rather than having to abandon their land in difficult times.
- Addressing possible changes in the numbers and position of agricultural workers, a possible objective is to improve and enhance the labour market regulations for part-time agriculture employees ("temporeros"), aiming towards a more modern and fair legislation and social framework, benefiting from European experiences and regulations.

20.2 Fishing

- Basic issues to be examined by the main participants in the sector are: (i) how to improve regulation on when and how much must be the catch limits, and (ii) how to introduce incentives to reducing the waste of resources produced by the industrial sector's "discarding" process, when just the most profitable species are retained. Support for the analysis of different policy options and of dialogue within the sector could be of great importance.
- Measures should be taken to ensure that the European investment in the Chilean fishing fleet is an investment in the sustainability of Chilean fishing reserves. EU institutions, fishermen and environmental organisations have experience in developing a different regulatory environment and this experience could be a positive element in developing the regulatory structure and in stock conservation in Chile. Support could be given to developing an EU-Chile dialogue on fish stock conservation. At an absolute minimum, European owned boats must fully and consistently respect quotas and be seen to do so.
- Solutions to the serious problems facing the sector can only be achieved through dialogue. Representatives of fishermen, both industrialised and artisanal, regional authorities and regional environmental agencies (COREMAs) need to play an active role in the policy-making process in the sector.
- The artisanal fishing community needs to be empowered and financed to participate in the management of fishing resources and to face the serious challenges that face them. This requires access to alternative sources of employment, either within the fishing industry as a whole or in other sectors.

There are possible sustainability risks in implementing the EU-Chile trade agreement in the fishing sector. Is there a better alternative? The fundamental problems in the fishing sector pre-exist the EU-Chile trade agreement and so will not be solved by its abandonment or postponement, which would cause the loss of much-needed new employment opportunities. A sustainable solution requires dialogue and management of saleable resources that are allocated by agreement between the groups concerned, with full protection for the rights of artisanal fishermen. The arrival of the EU-Chile trade agreement does make a solution more urgent but also perhaps more possible.

20.3 Technology transfer

In a number of sectors in Chile there are factories that do not have access to pollution-reducing technology, although other companies may well have this access. The objective of technology transfer as a mitigating action is to provide the technical means to reduce various forms of pollution that would

otherwise result from increased production from the EU-Chile trade agreement. The sectors where such an action could prove useful include mining and metals, food processing including fish processing, chemicals, and pulp and paper. Care will have to be taken to avoid giving an unfair advantage to plants that are assisted with technology transfer and to avoid providing a disincentive to companies to invest themselves in pollution-reducing equipment.

20.4 Monitoring

Periodic monitoring and evaluation should analyse the impact of the EU-Chile trade agreement (and thus implicitly the projections contained in this study); and the relevance and impact of the mitigation and enhancement measures adopted. The aim should continue to be to understand why, how and where sustainability impacts occur; what can be done to ameliorate the sustainability impacts; and what counteracting policies do and do not work and why.

The aim of monitoring and evaluation is thus both continuing analysis and policy prescription and should cover both the trade policy itself and the mitigating measures.

21. Limitations and Problems Encountered

The major issues are:

1. The description of the Trade Agreement
2. Feedback and interaction between the stages of the project
3. Ensuring the balance and comprehensiveness of the report
4. Information from interested parties
5. Short time and resources available

21.1 The description of the Trade Agreement

No ex-ante SIA can obtain a detailed description of a Trade Agreement or other policy change under study, although some information such as a broad description of a negotiating mandate can be provided. Similarly, the basis for the development of each scenario can be discussed. Nevertheless, it is evidently difficult to analyse the consequences of a policy change in these circumstances. The methodology we have developed takes this inherent situation into account by creating a two-step process. In the first step, the trade agreement is modelled on the basis of the information made available. This is sufficiently accurate for the first stage. In a second step, more detailed studies are undertaken of areas or sectors that have been identified by the first analysis. At this point, greater detail on the trade measures is required. Usually, this will also have to be estimated by the study team, as only during the analysis of the final agreement will full information be available. In the special case of the present study, the full information concerning the EU-Chile trade agreement was made available to the study in time to be fully considered.

21.2 Feedback and interaction between the stages of the report

The screening and scoping methodology as originally outlined in section 4 and applied in section 10 was essentially linear in character. Following the analysis of the economic impacts, the social and environmental impacts were to be studied. Together these analyses would yield the full Sustainability Impact analysis.

It was understood from the outset that information and/or analytic tools available are often incomplete. Therefore, screening criterion 4 was developed to identify for further study those areas where there are 'Known problems with information or initial analysis.'

This criterion was used, among other areas, to support further analysis of the economic impact on the services sector of the EU-Chile trade agreement. The results of this detailed study appear in section 15 (*Sector study: Services, Foreign Direct Investment and Intellectual Property*). The rationale for this detailed study is that the computable general equilibrium (CGE) analysis in section 9 (*Macroeconomic Analysis*) that uses the GTAP model is not as complete for services as it is for production sectors. This is a common issue with CGE models and comes from the less developed nature of statistics on services, especially internationally exchanged services, as opposed to trade in goods. The FTAP model, described in section 15, is being developed as one attempt to deal with this issue but a complete answer is not expected in the near future.

The need for a separate analysis of the economic impact of trade agreements on services should therefore probably be a general feature of SIAs that use a

CGE-based analysis such as the one we have developed. If the analysis of the economic impact on services can be performed more or less in parallel with the CGE-based analysis, time could be saved and perhaps there could even be some interaction and feedback between the two. This would avoid the situation that this study encountered, in which the services-specific study considered that services might grow rather faster that than the GTAP analysis projected. However, the integration of two separate economic analyses is likely to bring about its own methodological issues.

In this study, because of the very short time available and because the economic study of services was undertaken after the CGE (GTAP) study, little time or resources remained for detailed studies that might have resulted. The actual outcome of the economic analysis of services led to the study of environmental impacts in land transport (section 14). This, however, was directly identified by the CGE study. The environmental impact of increased tourism (also section 14) was identified by the services study.

The two observations that this is not a major sustainability impact and that there are no other major social or environmental issues that arise from the services economic study are fortuitous.

In sum, the identification in the screening process of a study on the basis of criterion 4 – known problems with information or analysis – should immediately trigger a feedback mechanism. The results of any detailed study undertaken on the basis of this criterion should be subject to a second stage screening / scoping exercise.

Further, sustainability impacts can themselves generate an impetus for further sustainability issues. Therefore, in principle, a second round screening / scoping exercise should be undertaken using the sustainability impacts discovered as inputs.

In practice in the present study, there would have been neither time nor resources available to undertake such a second round 'feedback' analysis.

21.3 Ensuring the Balance and Comprehensiveness of the Report

21.3.1 Balance

The screening and scoping parts of the methodology as defined in section 4 and applied in section 10 define and implement criteria for identifying the elements of a trade agreement that are susceptible to lead to sustainability issues, especially potentially major negative impacts. There is no guarantee that this process will lead to selection for further study of a range of potential impacts that are 'balanced' or 'representative' of different areas of the economy. In general, the selection of potential consequences of a trade is, instead, likely to emphasise three areas, based on the screening criteria:

1. The first criterion for selection is that a sufficiently rapid economic change is considered to occur as a consequence of the trade agreement that constitutes in itself an economic sustainability impact. This criterion is likely to be linked to sectors, products or activities for which there is a considerable reduction in the trade agreement of tariffs or other protection measures. In this study, only the Processed Foods & Other Agriculture sectors were identified under this criterion. While this criterion can, in principle, apply to any sector, it is more likely to occur in sectors that were previously considered 'sensitive'.
2. The second criterion for selection is that there is economic evidence for changes to the structure of production methods as a consequence of the trade agreement. A possible causal link can then be made from the

change in the structure of production to social or environmental sustainability impacts. This criterion is more likely to apply to trade measures that affect economic sectors where non-marketed resources such as common land, other natural resources held in common and non-wage labour are employed. Another reason for identification under this criterion is the admission of foreign direct investment to previously reserved sectors. This criterion is more likely to apply to 'primary' sectors that exploit natural resources, including mineral resources; or to other sectors where non-wage labour is used or where part of the product is not marketed. A number of sectors were identified in Table 10.1 under this criterion. These were all 'primary' sectors with the exception of food processing and non-ferrous metals. Both of these were identified on the basis of expected Foreign Direct Investment. The Non-ferrous metals sector is also closely linked with the mining sector, which previously reserved to national investment (with exceptions not relevant to EU companies).

3. The third relevant criterion is that the increased output of an economic activity, a direct or indirect consequence of the trade agreement, is directly related to environmental degradation. These 'polluting' sectors largely occur in industrial processes that are concentrated in mining and manufacturing. However, some services, such as transport and, to a lesser extent tourism, are also included here. In this context, general economic growth may also be considered.

Thus, there is no prior expectation that a sustainability impact analysis will be balanced across sectors. In the absence of a natural 'balance', it seems reasonable to search instead for a concept of 'full coverage' to attempt to provide an overview of the Sustainability Impact Analysis.

21.3.2 Comprehensiveness

This report is required to be 'comprehensive'. Therefore it needs to consider all potential sustainability impacts that resulting from trade measures, whether tariff or rules-related, that are part of the trade agreement or other policy change under discussion. Moreover, the report needs to demonstrate this comprehensiveness.

The approach to achieving comprehensive coverage has been to analyse all potential sustainability impacts at their point of economic impact using an exhaustive set of economic classifications and a set of criteria that identify all potential sustainability impacts.

The possible omissions in this process could come from three sources:

1. Potential sources of impacts that are hidden within overly diverse economic sectors.
2. An incomplete set of criteria for analysing sustainability impacts.
3. Faulty application of the criteria or missing information that is not recognised as such.

The economic sectors were defined in section 8.4 with the objective of ensuring that potential sustainability issues could be identified in the screening process. This process of representing the trade agreement is necessarily based on prior information and there is no obvious method of verifying that this is being performed correctly. Moreover, in most studies, there is unlikely to be sufficient time or resources to revise the sector definitions in the light of information that arises from the screening process.

Since many sustainability impacts are related to pre-existing sustainability issues, it makes sense to commence future Sustainability Impact Analyses with an overview of pre-existing economic, social, environmental and 'process

ownership' issues. This should help the process of sector definition, although there does not appear to be a certain method.

The economic classification itself is exhaustive and does not pose any particular problems that have been detected.

The four criteria for selecting trade measures for further study on the basis of economic and other evidence are intended to be comprehensive. They were therefore developed from the definitions of economic, social and environmental sustainability and from previous SIAs. However, there is no internal test to ensure that they are indeed comprehensive. Similarly, there is no method of verifying that they have been applied consistently and correctly.

The process of feedback described at section 21.2 will help to ensure that all issues are covered. In addition, future reports could organise their social and environmental summaries on the basis of sustainability indicators to help ensure comprehensive coverage. This will also reduce repetition and improve readability.

Despite these methodological concerns, the present report is considered to cover all the main issues of concern. The resources available, not the methodology, provide the constraint on covering further minor issues.

21.3.3 Depth of detailed studies

The objective of the detailed studies that arise from the scoping process is to describe and analyse an identified potential sustainability impact that may arise from a specific trade measure or measures. The scoping process defines the precise terms of reference for each such study.

The resources allocated to each such study will vary according to the complexity of the sustainability issues being studied and their relative importance. Detailed studies of significant issues can give rise to sector sustainability impact analyses.

The need to address a wide range of sustainability issues means that a fairly large number of detailed studies will usually be required. Some of these studies are fairly small and simply bring sector specialist knowledge to describe a known issue and potential solutions. For smaller detailed studies, the time required to define the terms of reference represents a fairly large part of the resources allocated.

There is no reason to suppose that the detailed studies contained in this report represent too great a depth of analysis or a mis-allocation of scarce resources. Nevertheless, it is difficult to allocate the very restricted resources among a large but still limited number of detailed studies to produce the results required.

21.4 Information from interested parties

Availability of information and comments from interested parties is itself of concern, despite the very useful information received and discussed below. This is because information on actual local conditions can have a major bearing on the analysis and assessment. This situation is perhaps largely due to the short timescale of the study. With more time available, interested parties may feel that they have more to contribute.

One issue that did arise from communication with NGOs was a demand expressed by them for people in Chile to have access to a Spanish language version of the report.

22. Summary of Conclusions

22.1 Economic

Overall, the impact of the EU-Chile Economic Partnership Agreement is to reinforce existing trends in Chile. The Agreement results in additional economic growth for Chile, equivalent to not more than a year's normal economic growth. This is the result of some economic restructuring in favour of sectors in which Chile has a comparative advantage, such as processed foods, agriculture, wood, pulp and paper and chemicals. Sectors in which Chile has a comparative disadvantage are steel, motor vehicles and other machinery. These sectors lose employment, as does mining due to increased labour-saving investment. None of these employment losses are large; there is no evidence for any economic sustainability issues in Chile.

While the greatest per person economic gains are realised in Chile, the EU's gains are larger in absolute value. In the European Union, the increase in value or income is spread thinly over a large number of activities. The overall gain in real income is around €800mn and no sector loses appreciably in any country.

In both Chile and the EU, the Agreement will bring about a combination of increases in employment and a reduction in prices relative to wages.

22.2 Social

In Chile, the combination of increases in employment and a reduction in prices relative to wages will help to increase the standard of living and reduce poverty among the majority of the people living in urban areas.

On the other hand, there are a number of pre-existing socially unstable and perhaps unsustainable issues that will be affected by the EU-Chile trade agreement, although the trade agreement cannot be said to be the root cause of these situations. In each of these situations, the issues are related to the existence of a dual economy and to difficulties with consistent and fair regulation or with title to land.

The overall impact on employment means that urban opportunities for self-employment, including in the informal sector must be created. On the other hand, many small farmers face an existing sustainability crisis reinforced by increased investment and competition from large commercial farmers.

Poverty must be reduced by the additional employment but will be made worse in the areas where negative employment outcomes are expected.

In the area of health and education, there is no obvious impact of the EU-Chile agreement, direct or indirect.

In terms of overall equity, inclusion in the usual economic processes through employment will be an important step for many people. However, existing inequalities in terms of practical rights and access to social and economic opportunities will not be challenged by the impact of the agreement. In some situations, such as small farming, artisanal fishing and forest-based Mapuches, there is a risk that their already precarious situation will be worsened. Women's access to employment, to capital, to land rights on equal terms is not yet universally achieved. While employment in some sectors where women are employed, such as food processing, will increase, no necessary change is created by the agreement to the pre-existing inequalities.

Indigenous peoples suffer from the same existing small farming problems as other people. Forest-using indigenous peoples consider that their lands are being encroached upon by increased commercial forestry, although the

increase in forestry is expected to be modest. Depending on the electricity generating strategy chosen by Chile, they may or may not be negatively affected, although such a negative impact is not a necessary consequence of the EU-Chile agreement.

Without the EU-Chile trade agreement, the existing social problems will continue. While the agreement will not solve all of these problems, it will bring considerable social benefits to a large part of the population. The agreement will also bring opportunities to address some of the pre-existing social problems.

22.3 Environmental

Increased industrialisation implies negative scale effects that for air, water and land quality generally outweigh benefits from technique effects. Land and water quality are also affected negatively by agricultural intensification. For these indicators, some localised environmental improvements could occur from technique effects but we also note the potential local seriousness of mine-induced pollution. Biological diversity impacts are largely a function of the electricity strategy chosen; a strategy that may cause such impacts is therefore not a necessary consequence of the EU-Chile trade agreement. Natural resource stocks, notably fishing stocks, depend on the effective implementation of appropriate management techniques rather than on the Agreement.

Chemical and Non-Ferrous metals industries are heavily involved in the pressure operated on the environment, but companies are increasingly aware of the problem. However, despite voluntary engagements and new regulations, the environmental scale effect resulting from the EU-Chile agreement is likely to overweigh the expected technique effect.

The major sustainability issues that affect agriculture concern the intensification of commercial agriculture. This trend is not fundamentally caused by the EU-Chile trade agreement but the agreement adds to its effects. The consequences of the trade agreement clearly interact with existing trends to cause possible sustainability impacts.

Past mechanisation led to increased pressure on fish stocks. In recent years, policing of quotas has improved and current market based proposals aim at doing this further. If the measures being taken to protect fish stocks are effective, then the EU-Chile trade agreement will indeed have no impact on fish stocks. If, on the other hand, a failure of the regulatory system were to occur, then the increased demand brought about by the tariff reductions would increase the incentive to fishermen to evade the quotas. The competitive pressures brought about by increased investment in the industry might have a similar effect.

22.4 Mitigation and Enhancement

Most if not all of the sustainability issues have been experienced in Chile for quite some time. Great efforts have been made to improve environmental quality. Because of this, especially concerning environmental sustainability, many of the structures for the mitigating (flanking) measures required already exist. In the cases where a consensus exists, there is usually a fully effective regulatory body.

The role of the EU in acting to mitigate the negative sustainability consequences of the EU-Chile agreement could therefore generally be seen as a participant and supporter of efforts already under way; as a source of support where new resources are required for research; and as a partner in a

two-way EU-Chile mutual education dialogue in those situations where a consensus is still to be built within Chile.

It is perhaps not surprising that the sectors where the sustainability impacts have been most noted are those where there is competition for non-marketed resources: fishing and agriculture.

The overall impact of the EU-Chile Association Agreement will benefit Chile by reinforcing existing growth trends. But at the same time, pre-existing social and environmental issues might require additional flanking measures to ensure that the people of Chile enjoy the full benefits of the agreement.

As the sustainability impacts are closely related to existing effects, the mitigating measures must address the underlying situations.

To this aim, Corporate Social Responsibility (CSR) initiatives[83] can play a major role in supporting the efforts of stakeholders and flanking measures of the Parties. By committing to reach high levels of environmental and social behaviours, the companies, foreign and domestic, will help supporting the efforts of governments, and thus maximise the benefits of the Agreement, while minimising its negative impacts. Moreover, dialogue between stakeholders, at national and local levels, will help reaching better understandings on their respective concerns and objectives.

CSR issues should therefore constitute an integral part of the implementation of the Agreement.

The objective of technology transfer as a mitigating action is to provide the technical means to reduce various forms of pollution that would otherwise result from increased production from the EU-Chile trade agreement. The sectors where such an action could prove useful include mining and metals, food processing including fish processing, chemicals, and pulp and paper.

Table 22.1 shows the objectives of the main mitigating and enhancement measures discussed, together with the groups who could be involved in any possible activities. Note that only the intended beneficiaries and their negotiating partners are shown in the column 'Key Participants'.

[83] The parties to the Agreement have already taken commitments in that direction, since a Joint Declaration states that:
"The Community and its Member States and Chile jointly remind their multinational enterprises of their recommendation to observe the OECD Guidelines for Multinational Enterprises, wherever they operate."

Table 22.1 Mitigation and Enhancement Measures: Objectives and Participants

Sector / issue	Objective	Measure	Key Participants
Fishing	Ensure EU investment in fishing is investment in sustainability	Corporate social responsibility	Chilean and EU owners of fishing boats; artisanal fisheries representatives
Fishing	Assess the risks of over-fishing	Data collection & analysis of stocks and eco-systems	Research institutes, fishing boat owners, artisanal fishing representatives, government
Fishing	Support for artisanal fishing communities	Support for participation in stocks management and alternative employment	Men and women in artisanal fishing communities and their representatives, local government
Agriculture	Limiting soil degradation and pesticides pollution	Evaluation of existing measures, improve enforcement of existing rules, promote environmental production methods	Small and large farmers and their representatives, government
Agriculture	Ensuring small farmers can benefit from their assets and skills	Establishment of title to land, access to markets and finance, skills acquisition	Small farmers and their representatives, government
Agriculture	Ensuring labour market position and access to social services of agricultural labourers, especially part-time agriculture employees (“temporeros”)	Improve and enhance labour market regulations, aiming towards a more modern and fair legislation and social framework.	Agricultural workers (male and female) and their representatives, employers' representatives, government
Mining, Chemicals, Food processing	Application of industry best practice in environmental regulation	Technology transfer	Producers and their representatives, government
Electricity	Lowering demand consistent with output and consumption increase	Demand side management, energy efficiency	Electricity producers and (industrial) consumers
Transport	Reduce urban transport-related pollution	Exchange of information EU-Chile	Environmental authorities, transport providers
Forestry and Wood, Pulp and Paper	Assess environmental damage, including on native forests, policy impact	Data collection & environmental and economic analysis	Producers, government, forest beneficiaries
Tourism	Ensure tourism development does not damage environmentally sensitive sites	Support for adapting and implementing standards for ecological tourism and for methods of testing and policing waste discharges	Tourism producers and their representatives, government

D. Information Sources and Analysis Tools

23 Contacts and Communications

23.1 Comments on study by the Chilean Government

The Chilean Government gave its initial reaction to the study at a meeting with the Commission, the study team and civil society representatives on 20th November 2002.

The Chilean Ambassador, Mr. Alberto stated that he was generally happy with the study, from which he had learned much. He noted that the study implied an increase in the demand for skilled labour, which is what would be expected from increased trade and development. As a result, he noted the need to emphasise the development of the education sector.

The Ambassador also noted that the study concentrated generally on the impact of the EU-Chile trade agreement on Chile. The study team responded that the initial economic analysis suggested that the overall impact on the EU would be spread thinly and thus no sustainability impact would be expected. Nevertheless, the study team examined (in Chapter 16 of the report) the possible economic impacts at member state and sector level. Both these analyses led to the study team's conclusion that further work in this area was not justified.

The Chilean Delegation made the following points but noted that they had not yet had time to complete their full reading of the report:

- The study is favourable to Chile.
- The study methodology formed a major part of the report and reflected Chile's interests.
- The implementation of the methodology was sometimes in some cases reflected lack of data, especially on social issues.
- The use of Chilean consultants was greatly appreciated as this meant that the study was not only based on internationally available data.
- The delegation considered that data used included the 1996 input-output matrix. This was felt to require updating. However, it is very unusual internationally for an input-output matrix to be updated more than once every 5-7 years, due to the costs involved.
- The trade agreement is expected to result in increased demand for skilled labour. This point should be emphasised.
- The proposed trade agreements with Canada and the USA have been studied using broadly similar methodologies to the Planistat study and have arrived at similarly positive results.
- The sectors selected appeared to reflect existing development efforts and thus did not investigate previously unknown issues.
- The delegation considered that the possible impacts on health indicators were not sufficiently explained or explored.
- The efforts made by Chile to obtain the ISO certified forest management label are not mentioned.
- Considerable investment has been made in mines, many of which are emission-certified; the inefficiency mentioned by the report may still apply to older mines.
- The benefits from the use of gas in electricity generation are not clear.

- The proposed fisheries law has undergone consultation with all interested parties.
- Chilean corporate social actions are not discussed in the report.

The Chilean delegation intends to produce a commentary on the report in January 2003.

23.2 Civil Society communication

23.2.1 Overview

The study team has been involved in the following activities to ensure discussion and feedback on its activities.

The Inception Report was distributed to the civil society representatives listed in that report. The study team has received reports and communications from the civil society organisations listed below. Reports have been reviewed in the literature section and the underlying observations have been incorporated into the screening criteria used by the study.

Information from interested parties and case studies is very important because it gives knowledge about the actual local situation, especially on how market oriented activities interact with non-market activities.

The study team sent a representative to the EC Commission Civil Society SIA meeting held on 6 May 2002 to discuss the IDPM methodological / WTO study and the SEI agricultural sector study.

The study team made a presentation to the EC Commission Civil Society SIA meeting held on 24 May 2002, covering the study methodology and results so far. The comments received covered both the report presentation and its contents. The study team found these contributions to be very useful. In particular, there has been a discussion of the importance of correctly implementing and monitoring SPS regulations.

Contacts have also been received from interested parties concerning access to the report, submission of information and establishing means of contact.

Contacts from which communication has been received include:

- Balanced Trade / WWF
- CEPII
- CIPMA (Centro de Investigacion y Planificacion del Medio Ambiente), Chile

  In particular, CIPMA requested further examination of the wines and spirits sector. The relevant analysis of this sector is given in Section 10, Implementation Step 2: Screening and Scoping.
- Commission (DG Trade, DG Dev, DG Fish)
- Grupo Zappalar
- ICSF – International Collective in Support of Fishworkers

  A major concern raised and communicated by ICSF to the study team was related to improving the process of governance, by making available a Spanish version of the current SIA study report "*in order to allow a participation of the Chilean fishing communities in this SIA study*". While sharing this concern, the study team informed ICSF that this was not foreseen in the terms of the reference of the project but that the Commission (DG-Trade) will be informed about this matter.
- ICTSD (International Centre for Trade and Sustainable Development)
- IEP - Instituto de Ecología Política
- Maeander Enterprises Ltd.;

- WIDE – Women in Development Europe

23.2.2 Women in Development Europe

The following communication was received from WIDE:

We are writing to you to present our thoughts and comments on the so-far integration of the gender equality indicator in the mid-term report 2002 on the "Sustainable Impact Assessment (SIA) of the trade aspects of negotiations for an Associate Agreement between the European Commission and Chile".

First of all, we would like to welcome your initiative to integrate the gender equality indicator in the set of indicators which are to be integrated and further developed in the future phases of the above mentioned impact assessment study. This is an important step in recognising the potential differentiated impact of any trade agreement on women and men and the significance of gender equality for the achievement of sustainable development.

Having said this, we have noticed that the choice of gender equality indicators used in the mid-term report is limited to situational indicators (such as Gender Development Index, female and male employment rates, gender occupational segregation). Such situational indicators only provide a general overview of the position of women in a specific country and cannot be necessarily related to the trade agreement under analysis, in this case the Association agreement between the EU and Chile.

In our view, a gender analysis of trade agreements and policies requires the following elements:

- *Data on trade as well as on the social, economic and political position of women relative to men'*
- *A theoretical framework with causal relationships, costs and benefits and direct as well as indirect relationships between gender and trade*[84]
- *A thorough understanding of the existing links between gender and other indicators (social and economic),*

Furthermore, the gender and trade indicators adopted should be indicative/representative of women's participation in the economy and should be applied to these economic sectors in which further trade liberalisation can potentially have a significant impact (positive or negative) on women's lives.

Having said this, we need to emphasise that WIDE's position is that the gender equality indicator should not be treated in isolation from other indicators: On the contrary, there should be links established between the gender equality indicator and other social indicators, such as poverty alleviation, human health, education and human settlements but also with economic indicators, such as loss of land rights.

In the same context, we argue that the use of situational indicators should be complemented by the use of political will as well as dynamic indicators as it is suggested in our publication "Instruments for gender equality in trade agreements: European Union-Mercosur-Mexico" which we enclose in annex to this letter

More specifically, the methodological strength and importance of dynamic gender and trade indicators lies in the following characteristics:

[84] Van Staveren Irene. WIDE Information Sheet 'Gender and Trade Indicators', February 2002

- *Dynamic indicators combine data presented under the situational indicators, with data on trade, including a sectoral breakdown of trade (agriculture, industry and services sector);*
- *They enable the monitoring of gender and trade links over the period that a trade agreement is operating; --*
- *They enable an analysis of effects of gender inequality on trade performance.*

Some examples of dynamic indicators are the following:

- *Access to the labour market: Variation in women's share in total employment relative to changes in exports and changes in total trade; Variation in women's wages in export-oriented activities over variation in the share of women's wages in total female wages, by economic sector*
- *Labour insertion characteristics by gender: Variation in female labour participation over changes in total employment in export-oriented activities*
- *Employment quality: Evolution of labour segregation in export-oriented activities and in those vulnerable to international competition*
- *Women's control over means of production: Variation in the proportion of female land owners out of all land owners over changes in exports.*

For the reasons explained above, we strongly recommend the integration of dynamic gender and trade indicators in the current phase of the SIA on EU-Chile Association Agreement.

Hoping that you will take our recommendations into consideration, we kindly remain at your disposal for any further information. We would be happy to discuss with you in the future ways and challenges of integrating the gender indicator into the Sustainable Impact Assessments, which the European Commission is planning to implement in relation to major WTO agreements and inter-regional trade agreements (including the EU-Mercosur negotiations).

Bénédicte Allaert, WIDE Project Co-ordinator, Maria Karadenizli, WIDE advocacy and network officer.

23.2.3 ICSF /CFFA

First Communication

Recently our organisation hosted a Chilean delegation from the artisanal fishing sector. Whilst in Brussels we arranged meetings for them with functionaries from the Commission (trade, fisheries and development DGs), the EU Parliament, and Chilean Embassy.

We would warmly welcome an interaction with you, and to learn about how the fisheries sector is being included in the SIA.

There is a great deal of concern amongst the artisanal fisheremen's associations that the EU-Chile association agreement linked to the new fisheries bill on transferable quotas will result in the fisheries quotas by-passing the artisanal fisheries and accumulating in the hands of EU companies.

Attached is a short note in English and a press release which describe the issues of concern to us.

Brian O'Riordan, ICSF Brussels Office Secretary

CFFA Coalition for Fair Fisheries Arrangements / CAPE Coalition pour des Accords de Pêche Equitables

Press Release

EU-Chile agreement: The Spanish Fishing Industry's Trojan Horse.

Brussels 19th June 2002

In May, a free trade agreement was signed between the EU and the Chilean Government. It contains various components, including a protocol on fisheries investment. If ratified, this will allow European companies to purchase 100% ownership rights in Chilean fishery enterprises.

The conclusion of the agreement comes at a time when the Chilean government, despite facing considerable opposition from artisanal fishermen, environmental organisations, and indigenous peoples, is trying to introduce a system of Individual Transferable Quotas (ITQs). The ITQ system will privatise access rights to fisheries resources and will encourage the concentration of quotas in the hands of a few large companies

According to Cosme Caracciolo, President of CONAPACH[85], "the overcapacity European fishing industry is making a bid for Chile's fisheries, using the EU-Chile agreement as a Trojan Horse". This puts the future prospects of 60,000 Chilean artisanal fishermen at risk, because if the agreement is approved by the European and Chilean parliaments, European operators, mainly from Spain, will be able to set themselves up as Chilean companies. Thanks to their large size, they will be able to seize the lion's share of the ITQs.

The President of CONAPACH and the Director of the Chilean NGO ECOCEANOS, Mr Juan Carlos Cardenas, are currently in Brussels on the invitation of ICSF and CFFA[86]. They want to alert the European institutions and parliamentarians to the negative impact of the EU-Chile agreement on the Chilean artisanal fisheries sector, and to ask them not to "become unwitting accomplices in an initiative that will undermine sustainable development and put the food security of the Chilean people in jeopardy".

The artisanal fishing sector provides jobs and income for around half a million people, and supplies the local market with 90% of its fish consumption requirements[87].

The representatives of CONAPACH and ECOCEANOS have met functionaries from the European Commission's various services, to share their concerns and request that a social and environmental impact analysis be carried out on the fisheries protocol. They also want assurances that adequate measures will be taken to prevent the export of European fishing overcapacity to Chilean waters, which would sound the death knell for the Chilean artisanal sector.

The two organisations made an intervention in the European Parliament, at a session which included a presentation by the Spanish Ministry of Fisheries, Mr Miguel Arias Cañete.

In response to claims made by Mr Cañete that Chilean ports are closed to European vessels fishing on the high seas, Cosme Caracciolo clarified that

[85] National Confederation of Chilean Artisanal Fishermen, the main organisation representing Chilean artisanal fishermen with 40.000 associated fishermen.

[86] ICSF: International Collective in Support of Fishworkers; CFFA: Coalition for Fair Fisheries Arrangements

[87] In Chile fish provides 12% of the protein intake, with an annual average per caput fish consumption of 20 kgs

this only applied to the landing of fish catches. Claims that vessels were barred from entering Chilean ports to discharge sick fishermen, refuel or undertake repairs etc were simply not true, he said.

CONAPACH and ECOCEANOS welcomed the important statements made by European Commission in their Communication on Fisheries and Poverty Reduction, and in the Commission's Green Paper on the Future of the Common Fisheries policy. They welcomed the EU's commitment to sustainable and responsible fisheries outside community waters, and the recognition given to the legitimate development aspirations of other countries. They called on the European Commission to apply the FAO Code of Conduct of Responsible Fisheries to the EU-Chile agreement, drawing attention to the provisions made for the priority access rights of artisanal fishermen to their fishing grounds.

The two organisations requested that public debates be organised both in Europe and in Chile on the fisheries protocol, in which organisations of professional fishermen and civil society can participate, in an open and transparent manner. They informed the European Parliamentarians that in Chile neither the professional organisations nor the parliamentarians had so far been able to obtain a copy of the text of the agreement. They were astonished to learn that the European Parliament had similarly only received partial information.

In response to MEP Patricia McKenna's intervention, Mr Arias Cañete promised to send a copy of the full agreement with the fisheries protocol to the Chair of Parliament's Fisheries Committee as soon as he returned to Madrid.

Béatrice Gorez

CONAPACH **ECOCEANOS**

EU-Chile Free Trade Agreement:

Chilean Artisanal Fisheries Under Threat

In 1999, negotiations on a political, economic and co-operation association agreement were initiated between Chile and the EU. To start with, fisheries did not form part of the negotiations, but a fisheries protocol was introduced at a later stage. The negotiations were completed on April 26 2002 in Brussels and a political pre-agreement was signed in Madrid by the Chilean President Ricardo Lagos and by the Spanish presidency of the EU on 17 May 2002 during the II Summit of Latin American Presidents and the EU.

The fisheries protocol of the EU-Chile agreement has three aspects: access to fisheries sector investments, based on reciprocity; rules of origin of the fish catch; withdrawal of tariff barriers.

The purpose of this document is to highlight how the fisheries protocol in this agreement jeopardises the genuine efforts being made by the Chilean artisanal fishermen to ensure sustainable and equitable fishery resource access, to eradicate poverty and to contribute directly to the food security of the Chilean population.

The EU has undertaken to promote a responsible approach to fisheries management at global level and to make sure that, in its relationships with countries in the South, the needs of the coastal communities and of the local population are respected and protected[88]. It is questionable whether

[88] Council resolution November 2001 on "Fisheries and Poverty reduction".

these principles will be put into practice in the proposed EU-Chile agreement, which is currently on the table. To make this agreement just and equitable, the artisanal fishermen are making some concrete demands, which are given at the end of this document.

The Importance of Chilean Artisanal Fisheries

Chile's Exclusive Economic Zone (EEZ) is located in one of the world's five most productive marine areas: the Southeast Pacific Ocean. In volume terms, Chile's fish catch is the fifth largest in the world, and in terms of production and export of both fishmeal (based on sardines, anchovies etc) and salmon and trout aquaculture, number 2. As far as food security is concerned, fish provides 12.4% of the average animal protein intake in Chile[89]. The artisanal fisheries sector provides 90% of the fish consumed by the Chilean population.

Artisanal fisheries provide 60 000 jobs directly: artisanal fishermen, divers, seaweed harvesters, beach fishers, etc. Many women are involved in the sector, engaged in fish catching, in trade, or in the preparation of

the gears used by the fishermen ("encarnadoras"). Overall, the sector provides more than 400,000 jobs both directly and indirectly. Artisanal fishing is also important for exports and annually provides 25% of export income from fishery products (swordfish, hake, eel, shellfish – with all the shellfish (both molluscs and crustaceans) harvested from the wild and exported coming from the artisanal sector).

Not only does artisanal fishing represent a culture and way of life carried out along the Chilean coast for over ten thousand years, it is also one of the motors driving social and economic development. Furthermore, the use of selective fishing methods makes it a key sector for the sustainable use of resources.

Privatisation of the Chilean Fishery

On June 11th 2002, the Chilean Government submitted a draft bill to the Parliament, with the objective of privatising fishery resource access rights through the introduction of Individual Transferable Quotas (ITQ). The Parliament must vote on this bill, called "Limite Maximo de Capturas por Armador" (maximum catch limits for boat owners) before the 31st December 2002. No public debate has been organised around this issue. Not even with professional organisations,.

With ITQs as the means, this privatisation bill proposes to hand over free of charge; and without any compensation to society, untold quantities of the nation's marine resources to a dozen large companies. These ITQs will be given for a period of 15 years, but renewably, thus making them potentially a "concession for life".

In this way the large companies will be allocated the lion's share of the ITQ fishing quotas, will be allowed to sell them (for example to European operators), divide them, lend them or speculate with them on the markets. This process of concentrating fishing access rights amongst economically powerful operators is described by some as "the feudalisation" of the sea.

Introducing ITQs in the way proposed by the Chilean Government will exclude the artisanal fishing sector from the system. The artisanal fishing communities lack the necessary capital to compete with industrial operators in the quota market. The effect of this will be to turn artisanal fishermen and their families into a cheap workforce, to be exploited by the fishery and aquaculture industries.

[89] The average per caput fish consumption is 20 KGs/year/person

In conjunction with the establishment of the EU-Chile agreement, from the 1st January 2003, the introduction of the ITQ system will also allow a trade in licences and fishing quotas between the large Chilean industrial operators and future European investors.

The privatisation process

In 2001, the Chilean government instituted “a transitory fishery law” which established Individual NON Transferable Quotas. This law has already enabled the industrial sector to obtain the lion’s share of the quotas.

In the case of one of the largest Chilean fisheries, for horse mackerel (Trachurus murphyii), the industrial fishery sector obtains 98% of the global annual quota. The allocation of quotas is based on the catch track record over the last five years. As well as the commercial catches, the industrial fishery has the right to include a whole series of catches including those taken for scientific purposes. On the other hand, the catches of the artisanal fishery, because it is often less formal, have not been fully registered. As a result the artisanal fishery has only been able to obtain 2% of the global quota in this fishery, which is insufficient to maintain the levels of its activities. The artisanal fishery for horse mackerel is an important source of local food security, whilst the industrial fishery transforms this fish into meal for animal feed (and takes a large by catch of species important to the artisanal sector).

The EU-Chile Agreement

The fishery protocol in the “political, economic and co-operation association agreement” between EU and Chile, has been described by the Chilean artisanal fishing sector as a “Trojan Horse” for European industrial fishing interests to overrun the Chilean fisheries.

The fisheries protocol of the agreement is a cause of concern for Chilean coastal communities, because:

The European companies, which are mainly Spanish, will be able to purchase 100% ownership rights in Chilean fishery enterprises. This will enable them to buy fishing quotas for fully exploited stocks, with renewable 15-year property rights. These stocks are composed of small pelagics (sardines, horse mackerel, etc.) currently fished both by the artisanal fishery (for human consumption) and the industrial sector (for fishmeal). What is more, the industrial fishery for small pelagics takes a large by-catch composed of thirty odd species, all of which form part of the species caught by the artisanal fishery. A massive invasion of European vessels into this fishery risks marginalising even further the artisanal sector and promoting fishmeal production over human nutrition.

The European companies will also have open (and free) access to “under exploited” Chilean fisheries resources. These include more than 90 species of high quality white fish species of high commercial value, which form the backbone of the artisanal fishery and of local value adding processing plants.

The cancellation of tariff barriers on salmon from aquaculture will promote significant production increases in Chile, with negative impacts on the coastal environment (pesticides pollution, escaped salmon that destroy local fauna, etc.). The increasing occupancy of the coastal area by salmon aquaculture also affects the access rights of coastal communities in the coastal zone.

EU and Chile: long established trading partners

The EU is Chile's main trading partner, with imports worth US$ 4,594 million in 2001. 60% of these European imports are from unprocessed natural resources.

The EU has investments in Chile worth US$ 17,380 million, mainly in the energy, banking, and telecommunications sectors, and in the health services. Spain accounts for 20% of foreign investment in Chile.

Chile exports its fishery products to Europe, mainly to Spain (33, 3%), France (17,9%), Germany (16%) and, to a lesser extent to the UK, Denmark and Italy.

One of the main fears of the fishermen is that the EU will use the fisheries protocol in the agreement to export its fishing over-capacity, when the major part of the existing Chilean industrial fleet is already 40% over-capacity.

The disaster caused by the EU-Argentina agreement is still fresh in people's minds. In the mid 1990's this allowed European fleets to enter the Argentine fisheries sector in force, but without any environmental or social impact analysis of how this additional fishing effort would impact on Argentina. The direct result was resource collapse and bankruptcy for local operators. The EU, which counted on this agreement to supply its market, has also felt the negative impact.

Repeating the same mistakes in the EU-Chile agreement would precipitate resource over-exploitation in the short term and the disintegration of the Chilean coastal communities. The knock on effect would be the migration of thousands of people from the coastal areas to the towns, increasing poverty, malnutrition and unemployment.

Demands of the fishermen

For all the reasons given above, the Chilean artisanal fishermen estimate that the fisheries protocol in the EU-Chile agreement is completely out of line with EU policy objectives for development (sustainable resources management and poverty reduction).

What is more, during the negotiating process, coastal community representatives, indigenous people who depend on fishing, and artisanal fishermen have been totally excluded from the debate. Until today, they have not received the complete text of the agreement between the EU and Chile. Furthermore, no environmental, social or economic impact analysis has been carried out on the fisheries protocol of the agreement. This risks causing a resource crisis and the disappearance of their sector.

Through this agreement, resource conservation and sustainable and equitable fisheries management in Chile become a responsibility shared by the EU. The artisanal fishermen therefore demand from the European parliaments, institutions and civil society:

The application of the precautionary principle to the fisheries protocol in the EU-Chile agreement so as to avoid irreversible damage to Chile's marine resources, to the artisanal sector, and to the food security of the local population;

As proposed by the European Commission[90], that information about the agreement, particularly the fisheries protocol, be diffused in such a way as to enable the professional organisations in the artisanal sector to analyse its content and potential social, economic, environmental and cultural impacts;

[90] in the Communication "Fisheries and Poverty Reduction", and in the Commission proposals for the new Common Fisheries Policy.

To ensure that the ratification of the EU-Chile agreement includes measures that: guarantee sustainable marine resource and ecosystem management; defend the rights of coastal communities and the artisanal fishery; and protect the contribution of fisheries to the local food security.

For more information, Please contact:

Confederacion Nacional de Pescadores Artesanales de Chile (CONAPACH)

Mr Cosme Caracciolo, President

The organisation has 42,000 members, representing small-scale fishermen, divers, seaweed collectors, beach harvesters, and coastal communities organised into 436 artisanal fishing ports, known as caletas, along Chile's 4,200 kms coast.

The aim of CONAPACH is to promote the sustainable management of marine resources and to defend and promote the socio-economic, political and environmental rights and interests of coastal communities and artisanal fisheries.

Centro Ecoceanos, Chile

Mr Juan Carlos Cardenas, Director

Ecoceanos is an organisation of both citizens and professionals concerned with the conservation and sustainable and equitable management of Chilean marine ecosystems and resources.

It undertakes studies, produces newsletters, carries out environmental training, and promotes the participation of civil society and consumer organisations, artisanal fishermen, fishing industry workers and coastal communities in the policies and management of coastal and oceanic ecosystems.

Ecoceanos is part of the "Parliament of the Sea", a citizen's coalition.

Second Communication

I would like to send you some comments on the fisheries components of the Planistat study, with some notes in the text.

1. There seems to be an omission in the report of any reference to the precautionary approach, its importance to sustainable fisheries management/use, and how this should be applied in the agreement. Given the precarious situation of several of Chile's most important commercial species, any increases in fishing effort should not jeopardise the sustainability of these resources.

Also, and as the SIA report notes, one important aspect is that the existing fishery regulations (through quotas) should be enforced. But equally important (if not more so) is restricting fishing effort (effort controls) through limiting fishing capacity (size and power of vessel) and catching capacity (gear related measures). Given that the Chilean industrial fishery is already suffering from overfishing, over investment and with surplus (unproductive/inefficient) capital, it seems vital that any "modernisation" (and improved competitivity) through new investments from the EU should take a precautionary approach. In particular, if part of the surplus capacity of the EU fleet is to be transferred (and reflagged) to the Chilean register,

this should not result in a net increase in the capacity in the already over capitalised Chilean fishing fleet. One issue is EU ownership of Chile's fishing capital, but the issue of vessel transfers (a serious danger) is likely to have a more serious impact.

2. In the context of sustainable fishing practices/fisheries management, there is no mention made of the important self regulatory measures being applied by the artisanal fishery to sustain resources, and how these measures could be jeopardised by external investment and new entrants (from the EU) to the sector, motivated more by short term economic gain than by long term sustainability. I feel that mention should also be made as to how the likely increases in fishing capacity resulting from EU investments should/can be controlled and regulated. The fisheries model adopted by EU member states (fewer, larger, more technically efficient vessels), and the fisheries policy framework (CFP) adopted at EU level have resulted in the overall degradation of the marine ecosystem and the depletion of fishery resources in EU waters, over investment in the fishing sector, and a situation where fishing effort in EU waters is significantly in excess of the resources available. There therefore need to be some substantial checks and balances applied to the fisheries components of the agreement. Merely applying mitigating (flanking)measures is likely to be inadequate (too little too late), and insufficient to ensure the full protection of the rights of the artisanal fishworkers.

3. On the issue of gender, true there seems to be little available in the official data. But there is some incipient work being undertaken by CONAPACH and other organisations, and some ground breaking work has been carried out by researchers on working conditions in fish processing factories (see 4 below). In the former case please contact CONAPACH (pescart@unete.cl <mailto:pescart@unete.cl>), in the latter Estrella Diaz Andrade (calqui@entelchile.net <mailto:calqui@entelchile.net>).

4. Re. Social Sustainability, the report claims that "the overall impact in the sector is for increased employment, which have important consequences for social sustainability in fishing communities". But no consideration is given to the nature or quality of the employment that will be generated. The record so far of the new employment generated by processing industries, aquaculture industries and industrial fishing is very promising for the future (the record of Marine Harvest and Nutreco being of particular concern). In many cases contracts don't exist, there is abuse of women and child labour, with fishermen having to work under unsafe and generally poor working conditions.

In this regard, I recommend that the following 2 reports be consulted:

- *Propuesta de Política Pública con Enfoque de Género: Fiscalización de Condiciones de Higiene y Seguridad en Empresas Pesqueras de la X Región (Proposal for a Public Policy with a Gender Focus: Controlling Health and Safety Conditions in Fishery Enterprises in the Xth Region), implemented by the Centre for Social Studies of the ARCIS University, with the support of the Labour Directorate; and*
- *Mejoramiento de Estandares Laborales en la Industria Procesadora de Salmonidos (Improving Working Conditions in the Salmon Processing Industry), financed by OXFAM UK and OXFAM Canada, and supported by the Regional Labour Directorate (Xth Region).*

5. The SIA report alludes to the lower levels of productivity in the artisanal fishing sector as an inherent problem. This is a dangerously out of date

productionist view. The important aspects of artisanal fisheries, particularly in Chile, include:

- *self regulation, which limits productivity through "input" controls. From a sustainability view point, this compares very favourably to the industrial fishery which (as noted) is regulated through "command and control" mechanisms, that use "output" controls like quotas. These have a notoriously poor record in regulating fisheries;*
- *in labour surplus economies (like the Chilean fishing sector), artisanal fisheries generate significantly higher employment per unit of capital invested than industrial fisheries;*
- *the artisanal fisheries play a crucial role in the food security of coastal communities;*
- *the artisanal fisheries are much more compatible with an ecosystems approach to fisheries exploitation, where diverse seasonally variable and highly selective fishing practices, targeting a variety of resources are inherent characteristics. As opposed to capital intensive industrial fisheries, which tend to target single species, use highly unselective fishing practices, with little if any seasonal or geographical variation.*

6. Combined with the ITQ system/quota management system, the scenario described of fewer, more efficient fishing-boats using fewer ports, is likely to cause a process of social and economic change where small-scale owner operators and fishing communities become transformed into a low cost source of seasonally migrating labour for processing plants and industrial fishing activities. As noted, this aspect needs some careful assessment, and some appropriate flanking measures need to be put in place.

7. There is no evidence that the proposal to implement a system of tradable fishing rights (ITQs) or market-based instruments to regulate and manage the Chilean fishery would assist a more environmentally and economically efficient exploitation etc (as the SIA Report claims). In fact, experience from around the world (particularly in Iceland), shows the opposite. With ownership becoming concentrated and fishers becoming dispossessed, illegal fishing increases (due to lack of alternative occupations in fishery dependent communities), quotas are rented out (defeating the objective to reduce fishing effort), and the workforce becomes "feudalised". Further the tendency for high-grading (discarding lower value, lower quality catches) mitigates against environmentally efficient exploitation.

8. The report focuses attention on the fully exploited fisheries, and makes no specific mention of the incipient fisheries. The latter have an open register, and are almost unregulated. They are mainly exploited by artisanal fisheries, and there is a fear that EU investment will lead rapidly to a situation of overfishing and resource depletion.

9. Improving the process of governance. One of the aims of the SIA, as I understand it, is to improve the process of governance by including inputs and dialogue with civil society organisations. This would be greatly enhanced by producing the report in Spanish as well as English. I wonder whether anything has become of our earlier interaction on this issue. Please keep me informed about this.

I hope these comments are of use. I look forward to seeing the full report.
With all good wishes
Brian O'Riordan

23.2.4 IEP Instituto de Ecología Política

Comments by IEP on the Sustainable Impact Assessment (SIA) of the trade aspects for an Association Agreement between the European Commission and Chile (Midterm Report, revised version- June 2002)

1) Comments on the identification of potential impacts based on the results of the General Equilibrium Model (GTAP).

Uncertainty and Sensitivity Analysis

Background: Uncertainty exists in various stages of the process of identifying and selecting potential impacts for additional analysis (the assumptions utilized in the General Equilibrium Model, the quality of data available, etc.)

Recommendation 1: Identify all the sources of uncertainty in this phase of analysis.

Recommendation 2: Model the uncertainty present in the impact assessment. IEP recommends that all potential impacts be ranked to identify the level of the impact. This will allow for the identification of some potential impacts that the actual model does not identify and incorporate into the next stage of analysis. The selection requirement should identify all potential impacts, even those with minimal potential for impact.

Recommendation 3: Complete a sensibility analysis to view the changes in the results after varying certain parameters of the model.

Recommendation 4: Complete an explicit analysis describing the implication of the results using the assumptions and hypotheses adopted.

Recommendation 5: IEP recommends that alternative scenarios be considered in the analysis of baseline scenarios (currently with and without the agreement), given the lack of understanding about the details of the exact agreement reached. If these alternative scenarios have already been developed, it would be helpful to view the results from the model with the scenario that incorporates the definitive agreement.

Comments: Although the grade of precision required in this phase is not as high as it is in the sector studies phase, we believe that these recommendations can help to identify potential impacts that have not would not otherwise be identified for in depth analysis.

Given that the model is already constructed, completing different simulations proposed in the above recommendations will not require a significant amount of additional time and resource commitment.

Sectors Modelled

Background: Given the capacity of the General Equilibrium Model, only 26 sectors will be modelled.

The wood, wood pulp and paper sectors were combined into a single sector. Although they have certain aspects in common, a separate study should be completed for each, given that they represent distinct products for export.

Recommendation: Identify the sectors that create the most significant challenges for sustainable development and separate them out from aggregate sector groups. Given that so many distinct sectors are lumped together into a single sector, it is impossible to detect all the potential impacts of each sector. This exercise will allow for the identification of sectors that were not identified in the selection process.

Quality of Data utilized in the Model of General Equilibrium

Background: The data utilized in the model is from 1997. However, the commercial exchanges between Chile and EU countries has experienced significant changes recently that could distort the results of the model.

The value of exports in 1997 totaled 4.144 million dollars and the imports totaled 3.957 million dollars (value in 1997 dollars). However, in 2001, only through the month of November, the exports totaled 4.594 million dollars and the imports totaled 3.064 million dollars (value in 2001 dollars) (DIRECON, January, 2002).

If the value of exports was measured in quantities, the difference between exports in 1997 and 2001 would be even greater, given the decrease in value in the large majority of export goods during the last few years. The annual price index for exports (with 1996 base = 100) in the year 2001 was 86.7 for the agricultural, forestry, and fishing products, 69.3 for mining products and 86.2 for industrial products. The annual quantity of exports (1996 base = 100) for the year 2001 was 109.3 from the agricultural, forestry and fishing industries, 157.5 from the mining sector and 146.5 for industrial sector (Central Bank, June 2002).

The copper mining sector also experienced a significant increase in exports from 1997 to 2001. While the quantity of exports (to the rest of the world) in 1997 totaled close to 3.297 million metric tons, during the year 2001, copper exports totaled 4.468 million metric tons (COCHILCO).

These figures demonstrate that during the past few years the quality of exports has increased. At the same time, prices have decreased.

Recommendation: In completing the sector studies, it is essential to use up to date information about trade between Chile and the European Union. The physical impact of export activities from one sector should be estimated based on the volume of exports and not on the dollar value of exports, given that the exports depend on the value as well as the market price.

2) *Comments and recommendations for the sector studies*

Specific sector studies

Background: The impact of the cattle farming expansion was underestimated due to the small incremental increase in production projected.

However, according to national authorities (DIRECON, 2002), beef exports are expected to increase as a result of the tariff free quota of 1 000 tons of beef. The quota will increase by 100 tons of beef per year. Given that this quota corresponds to 15% of the actual local production, it is likely that there will be increases in production and exportation in the near future.

The expansion of the beef industry can cause the following impacts: a) A change in land uses due to the increased demand for grazing land reducing the land available for crops used to cultivate goods for direct human consumption; and b) An increase in industrialization of agricultural activities that are not well regulated under sanitary codes. This may create damaging impacts on the quality of agricultural products and natural resources. In addition, it provides incentives for unsustainable and unsanitary agricultural practices, such as those that generated the crisis of BSE in Europe.

Recommendation: Conduct a sustainability analysis of the expansion of these production processes over the long term, taking into account the

increases in deforestation, elimination of natural habitats, and the irreversible reduction of biodiversity.

Background: It was concluded from the Model that the ¨Wood, Wood Pulp and Paper¨ sector would experience an increase in production that would not be significant enough to require an environmental study defining the direct impacts of the increased production.

The environmental impacts of the expansion of the wood pulp industry should be studied due to the nature of the production process and the lack of existing regulations. Currently, the industry is only required to comply with minimal environmental standards and the sector is barely regulated despite the fact that chlorine is used in production process generating toxic substances such as dioxins, furanes and other organochloride substances released during the whitening processes of pulp.

In addition, the quantity of exports has increased by 30% from 1996 to 2001 (Central Bank, June 2002), which means that there has been a significant increase in exports. Since the general equilibrium model used data from 1997, this increase was not incorporated into the analysis.

Recommendation: Analyze the impact of the wood pulp sector in terms of environmental sustainability.

Background: The fishing sector has been included as one of the sector studies to complete.

Recommendation: Analyze the environmental impacts of the salmon cultivation industry specifically due to its significant environmental impacts.

3) Comments on the evaluation of sustainability and indicators

Background: A combination of indicators is used to estimate the environmental impacts of certain activities based on a series of criteria (direction, magnitude, irreversibility, etc.).

Recommendation 1: It would be helpful to use an alternative set of indicators to measure how the results vary using these indicators as opposed to the indicators currently used. The evaluation should explain how the indicators are sensitive and why results vary. It is important to state that there is a multitude of indicators available to measure impacts (especially environmental indicators).

Recommendation 2: Explain when an impact is significant. Providing a rating using a series of symbols indicating if the impact is *not significant, marginally significant, etc.*, does not explain the point at which the impact is significant or not.

Recommendation 3: Not all environmental impacts are detected using the defined indicators. Therefore, in such situations, it may be necessary to conduct case studies.

3) Additional Recommendations

Recommendation 1: The sector studies should include a detailed analysis of the dynamics and time frames of the impacts. This is extremely important given that in order to evaluate environmental sustainability, it is necessary to analyze a determined time frame. This is especially relevant in areas where natural resources are the principle export to the EU. The studies should determine if the process and actual volumes of production are sustainable. In situations where they are not sustainable, marginal changes in production caused as a result of the agreement, could create significant impacts.

4) General critique of the methodology utilized in the study.

If aspects of the agreement are likely to create or promote activities that are unsustainable, the structure of exchange between Chile and the EU should be evaluated. The existing trade structures should be investigated to determine if they allow for sustainable development or not. The study should examine potential environmental and social impacts that may be intensified due to increased production and trade. Impacts in these areas may not be taken into account in the agreement. Therefore, it would be helpful if the sector studies focus on areas where the tendencies in the last few years show an intensification in trade.

For example, in the mining sector it is important to evaluate the environmental impacts of the production of large quantities of copper; specifically on the soil and water. It is also important to evaluate the economic impacts of the large-scale production of copper on small and medium-sized mines. Although the model indicates that the agreement will not result in a significant increase in mining exports, it is important to determine if the existing trade structures in this sector are sustainable, given the increase in quantities of exports during the last few years.

23.2.5 RIDES (Research and Resources for Sustainable Development)

Comments to the Sustainable Impact Assessment of the Trade Aspects of Negotiations for an Association Agreement between the European Communities and Chile

Prepared for the Society Dialogue Meeting on a Sustainability Impact Assessment of the Agreement's Trade Aspects.
Brussels, 20 of November 2002

Hernan Blanco
Nicola Borregaard
Annie Dufey

General comments

- The report is very well written and well structured.
- The report provides a good overview on many new issues that are included – for example services sector, transport sector, intellectual property rights - there is hardly any information on these in Chile so that the input by the study is very valuable.
- The document incorporates the impact on the sustainability of economic traditional sectors and also involves –but in a very general way- other important variables that have potential effects on the sustainability, such as Foreign Direct Investment (FDI) and Intellectual Property Regimes (IPR).
- Also, the report provides a basis on which to build up a discussion in Chile on the issues and on which more detailed studies, and especially more concrete proposals for mitigation measures could and should follow

Comments for improvement / incorporation, for a follow-up, or for consideration for future assessments:

1. The study remains, at times, too much on the surface – of course, there is a limit to detail, but a way to remedy is to declare openly the limits of these studies. Also, those sectors and issues that have been identified as potentially more important in terms of the impact could be studied in greater detail- greater detail not implying a literature review, as has been done in this report, but recollection of first hand data, and involvement of actors – the latter especially given that there is a great lack of data, as correctly pointed out in the study. This greater analysis could be announced in the study, but would certainly not be integrated but part of a follow-up initiative.
Some examples of conclusions or recommendations without justifications in the report are:

- p.123 : the reference to the salmon farming regarding environmental effects without any previous analysis of that sector
- p.117: market based instruments are already in place in the fishing sector – there is a system of transferable individual quotas for four species in place
- Mitigation measures: EU institutions´ possible positive influence on the regulatory system in Chile is such a general statement that it can sound rather arrogant – there would have to be much greater detail on which parts of the EU system could be useful to look at, on potential mechanisms of cooperation rather than on - if not, it would be better to remain with recommendations that could be in the EU´s sphere of action – that is, for example recommend the application of a stricter investment regime (rules for investing abroad)

2. There is a hypothesis in the report that suggests that the effects of sustainability only exist in so far as associated economic impacts occur previously. This is underlined in various sections of the report. The "screening" process of the study is based in this hypothesis, and is questionable for several reasons. The most obvious is that there could quite easily be effects that are not necessarily the product of economic impacts. That is to say a trade agreement could affect sustainability without necessarily having considerable economic impacts. In this context GTAP modelling is interesting but given its limitations it is doubtful whether the heavy emphasis on it can be justified.

3. The "screening" process is based in 4 criteria. These criteria do not include, or at least not explicitly, economic effects such as technology, product and the regulatory effect. The 4 criteria were summed up as economic importance, environmental importance and a possible lack of knowledge/information. This analysis is very much orientated towards tariff based topics and less to non tariffs items (as trade rules on investments, IPR, sanitary issues, etc.) In this sense the study does not take account of the effect (at least not in an explicit way) of other trade measures already used by the EU countries such as dumping demands that can be enhanced by the agreement due to a decrease of some sector's competitiveness and that can have important effects on the Chilean sustainability. That could be the case, for example, of salmon farming and wine production sectors.

4. The study does not include a probable subscription to FTAA or an agreement with the US in its analysis. Those potential agreements could be relevant in terms of the accumulative effects that may result, for example, the agricultural sectors.

5. Participation in the study on the Chilean side has been poor – the question should be posed whether a participatory mechanism consisting basically in E-mail contact is sufficient for carrying out these assessments. Participatory mechanisms are extremely important in strong assessments, and are the aspect that has been most deficient in the assessment studies that have been carried out so far in Chile (of which we have ourselves carried out some) There could be a sincere evaluation of the weakness of this aspect in the study (which is most likely due to budgetary restrictions…?)

Some specific comments

- The analysis does not differentiate amongst regions in Chile – this can be especially important in the agricultural sector where effects may be very different depending on the regions (we go from desertic to temperate climate regions with high rainfall). For example, the analysis of the crops sector does not recognize that erosion is a problem caused by traditional crops in the Araucania Region and because of this, in a scenario which sees a possible reduction in these crops, there is very little that could happen.
- The sector study "processed foods, …" goes into little detail on each of the very different sectors. For example in the agroindustry sector, the agreement can have several environmental or social impacts not mentioned in the study such: a change in lands use between agroindustry and traditional crops induced by tariffs change - on the one hand it may increase or reduce erosion problems and, on the other hand, it can also change the rate of use of pesticides.
- Regarding IPR the study only includes an analysis of traditional sectors. Considering the importance of the EU's biotechnological enterprises and the biodiversity richness of Chile other issues that arise and could be important to analyze are the relationships between IPR - biodiversity and IPR- indigenous traditional knowledge.
- In some sections there is no clarity on which are the agreement´s texts that could be relevant – that leads sometimes to generalities in the treatment of the sector and the potential impacts. This raises a serious doubt: for example, the Ecoceanos´ evaluation of the fishing section in the agreement (included in the annex of the report) is rather different regarding the investment implications – there is no analysis of how the different results (between the Ecoceanos and this study) can come about – there should be at least a comment on that and clarifying what are the relevant sections in the agreement –.

Studies that have been carried out "at distance" or with second hand information can make important contributions but obviously have their limitations – in this sense we consider the study more useful to the EU as a means of increasing knowledge on the Chilean reality, but with limited use to the Chilean context, if there was no strong follow up in the country.

23.2.6 Civil Society comments from presentation meeting of 20th November 2002

Only those comments not covered elsewhere in the report are presented here.

A number of persons present emphasised the recommendation for support for Corporate Social Responsibility as a means of mitigating potential sustainability impacts. Solidar (ISF – The International Solidarity

Foundation, Finland) questioned how this proposal could be incorporated into the trade agreement.

The FIDH (Fédération Internationale des Ligues des Droits de l'Homme) noted that their concerns about the Mapuche people had been met by the report, in particular by the statements on page 187 of the draft final report.

A staff member of DG Trade requested in a personal capacity whether the El Niño meteorological conditions had been taken into account by the study. The question was interpreted as asking whether the baseline situation took into account this situation and in particular whether an interaction between El Niño and the EU-Chile trade agreement could occur and had been analysed. The study team considered that the El Niño phenomenon had been explicitly taken into account in the fisheries study.

Both the study team and a number of participants considered that the coverage of the services sector was not commensurate with its importance to the Chilean economy or to Chile-EU trade.

The study team, in its presentation on communications, indicated that NGOs had raised the point that the English language presentation of the report meant that it was not accessible for most Chileans. This point was again made during the meeting by ICSF (International Collective in Support of Fishworkers). The point has previously been noted by the Commission and was duly noted again during the meeting.

ICSF also noted that the effects on artisanal fisheries that are discussed in the report could be expected to have implications for coastal fishing-based settlements and that these should be mentioned. What will happen to them, will the inhabitants have to move away from the coast? ICSF considered that more research should be conducted on the fishing eco-system as a whole, rather than concentrating on species analysis. ICSF noted the proposed introduction of transferable quotas. The representative suggested that the Common Fisheries Policy could lead to grants for transfer of fishing boats to Chilean waters and that the implications should be examined.

The World Union for Nature, represented by Mr. Jean-Claude Jacques, considered that the report remained on the theoretical side. He noted that no-one has experience in SIAs but that there is considerable experience on the kinds of impact considered in the study. He suggested that the negotiation experts should be integrated into the study team. He proposed that the question of monitoring should be integrated into the EU-Chile agreement.

A Deloitte Touche representative reported that they expected an increase in trade in copper wires between Chile and the EU as a result of the agreement.

23.3 Inception report: comments from the Commission and Study Team response

The Commission reviewed the Inception Report. The resulting issues raised by the Commission were:

- Demonstrating the logic of the report observations and identification of specific sectors
- Use of indicators
- The Commission noted that the logic of the report's observations must be very clear. This clarity consists of two elements:
    1. Demonstration of the comprehensiveness of coverage of the methodology
    2. Demonstration of the 'causal chain' logic in the identification (or non-identification) of specific sectors

The Commission considered that the preliminary screening of the specific sectors identified needed to be carefully justified. The links to the specific initial trade measures need to be shown.

The consultants were requested to include a one-page summary of their methodology in the Mid-Term Report and to include a section describing the changes and additions to the report as compared with the Inception Report. It was noted by the Commission that the methodology is still evolving.

The Commission representatives noted that the use of indicators is not fixed in stone and that the scope for innovation exists. In particular, the significance criteria and the representation of the results were highlighted.

The consultants were also requested to address the question as to how to achieve a better impact in consequence of the trade changes.

The consultants were asked to examine trade diversion from Mercosur, if possible.

In response to the Commission's comments, the study team has taken the following action:

- The Methodology section has been re-written to show how these points are being met. Section 2 provides a one-page summary of the methodology.
- The Inception Report provided a brief discussion about why the study team wished to ensure that certain sectors could be identified for the purposes of the modelling exercise. This discussion has been replaced by a general discussion about why and how sectors need to be so identified. This stage is not about screening, instead it a technical requirement aimed at ensuring that no potential issues are hidden.
- There is extensive discussion of comprehensiveness at appropriate points. Causal chain analysis is used to link the various stages of the discovery or elimination of sustainability impacts. In most cases, the actual causal chains remain incomplete prior to further study.
- There is a brief presentation in causal chain diagram form of the first results in terms of the sustainability indicators and study criteria. This is still an informal presentation, given that only a few results are available.

DG Fisheries

There has also been extensive correspondence with DG Fisheries, who have corrected the study team on matters of fact.

23.4 Project Website

The study team has prepared a Website (SIA-Mercosur/Chile) which includes information concerning the study and related issues, including reports, contacts and a bulletin board.

The full URL is http://www.planistat.com/sia/en. A link is provided to the DG Trade Website. More specifically, the Website provides access to:

- Project reports;
- Selected news in relation to the SIA-Mercosur/Chile project and access to The Commission's news release center;
- Selected (or access to) documents concerning SIA methodology, SIA tools, sustainable development, and other useful references;
- Links to interesting Websites related to the project, within the Mercosur/Chile region and world-wide;
- A Bulletin Board[91] to allow a communication and dialog with and among the visitors and interested parties;
- An address book of identified contacts so far;

The Website is operational since mid-June 2002. Up to end of December 2002, some 407 visitors[92] accessed the Website (in average 3 visitors per day), either directly or through referers such as *IDPM*[93], *Europa*[94], *BalancedTrade*[95] or *Internet search engines*. The access details are presented below:

- Direct access = 66%
- Access through referers = 34 %, of which:
  - *Internet search engines ..... (40.7%)*
  - *IDPM ..... (31.4%)*
  - *Europa ..... (17.1%)*
  - *BalancedTrade ..... (7.1%)*
  - *SIA-ACP Website*[96] *..... (1.4%)*
  - *Others ..... (3.4%)*

The main search topics used to access the Planistat SIA project site, were:

- European Chile project; European Community and Chile; EU-Chile Association Agreement;
- Impact assessment Commission of the European Communities; Sustainable impact assessment; Quantitative analysis of sustainability; Flanking measures;
- Sustainable development in Chile; Sustainable development and social impact assessment;

[91] There is no restriction to access to the Bulletin Board. It only needs a self-registration.

[92] Each visitor is counted once per day, even if the same visitor accessed the SIA-Mercosur/Chile Website many times during the same day.

[93] Institute for Development Policy and Management –IDPM (http://idpm.man.ac.uk/idpm/)

[94] The European Union on-line (http://europa.eu.int/)

[95] http://www.balancedtrade.panda.org/

[96] http://www.sia-acp.org/

- Social issues in Chile; Social impact policy development; social issues, environmental sustainability, economic growth; social impact assessment; implications of social impact assessment;
- Definition of Full trade liberalisation; Trade liberalisation in Chile; Negative aspects of trade liberalisation; Chile & economic liberalisation;
- Mercosur environment impact; negative aspects of the Mercosur; Rule of the Mercosur; Mercosur EU impact; Mercosur and EU + March 2002 negotiations; Trade Partners of Mercosur;

The next tables present a summary of the categories of visitors and the sector of activity to which they belong.

Table 23.1: Details of identified visitors' Website

Domain	Country	Visitor Website	Website Description
com	Australia	http://www.90east.com/	**90East**: Australian company providing a range of managed security services, such as Secure Internet access and gateway services, Secure hosting of customer Internet servers and applications, Intrusion Detection Services, Secure Virtual Private Networks
	Belgium	http://www.schumanassociates.com/	**Schuman Associates**: Belgian company specialised in European Union affairs. Provides their clients with accurate, up-to-the-minute information on the areas and subjects of particular interest to them. Represents their clients' interests to the relevant European institutions, most notably the European Commission.
	Germany	http://www.siemens.com	**Siemens (Business services)**: IT service provider for electronic and mobile business.
	Switzerland	http://www.cw.com/	**Cable & Wireless**: global communications company, provides integrated communications and e-commerce solutions, internet-based data and voice services
		http://thenew.hp.com/	**Hewlett-Packard**: Information Technology (IT) provider (Servers, storage solutions, management software, imaging, printing, PCs).
		http://www.motorola.co	**Motorola**: integrated

Domain	Country	Visitor Website	Website Description
		m/	communications and electronic services, networking and Internet-access, interactive digital video, voice and high-speed data.
		http://www.novell.com/	**Novell**: developing Net services software.
		http://www.sjberwin.com/	**SJ Berwin**: provides legal advice in various areas.
		http://www.websense.com/	**Websense**: provides employee Internet management (EIM) solutions. Websense Enterprise software enables businesses to monitor, report and manage how their employees use the Internet.
edu	Indonesia	http://www.ui.edu/	**Universitas Indonesia**
	USA	http://www.psu.edu/	**The Pennsylvania State University**
	USA	http://www.pitt.edu/	**University of Pittsburg**
	USA	http://www.purdue.edu/	**Purdue University**
	USA	http://www.yale.edu/	**Yale University**
int		http://www.europarl.eu.int/	**European Parliament**
org		http://www.eib.org/	**European Investment Bank**
		http://www.unicc.org/	**United Nations International Computing Center** (ICC): providing a wide range of Computing and Communication Services, on a cost recovery basis, to its Users world-wide.
		http://www.unido.org/	**United Nations Industrial Development Organization** (UNIDO), working with governments, business associations and individual companies to solve industrial problems.
net	Chile	http://www.vtr.net/	**VTR Globalcom**: Chilean company specialised in Internet, Telecommunication, and Cable TV services.
	Caribbean	http://www.caribe.net/	**Carib.net**: dialup and dedicated Internet access for businesses & corporations, web hosting services, virtual private

Domain	Country	Visitor Website	Website Description
			networks, and ISP-related services.
	India	http://www.sify.net/	**Satyam Infoway Limited (Sify)**: design and develop a host of customised eCommerce and Network Connectivity Solutions.
	U.K.	http://www.ja.net/	**UK Education & Research Networking Association**: government funded network for education and research.
		http://www.gip.net/	**Equant**: Equant is a global data and IP network and integration services for multinational businesses. Equant has established a strong presence in Latin America. Equant regional programs benefit from the full support of France Telecom, its strategic shareholder, which has investments and partnerships in Brazil (Intelig), Argentina (Telecom Argentina), and El Salvador (Telecom El Salvador).
		http://www.colt.net/	**COLT Telecom Group**: a provider of high bandwidth data, voice and advanced telecommunication services to business and governmental customers in Europe. It operates an integrated IP based pan European network linking the financial and business centres of Europe, providing the full range of telecommunications services to high value corporate and carrier customers.
at	Austria	http://www.or.at/	**IFO Net**: Internet domain searcher/registration
at	Austria	http://www.telering.at/	**Telering**: Connection network operator tele.ring: public provider of voice and data services on the terrestrial network.
at	Austria	http://www.raiffeisen.at/	**Raiffeisen Bank**
at	Austria	http://wu-wien.ac.at/	**Vienna University of Economics and Business**

Domain	Country	Visitor Website	Website Description
			Administration
au	Australia	http://www.gov.au/	**Australian whole-of-government single point of access (portal)**: the site provides links to ten entry points for Commonwealth, State, Territory and Local governments.
be	Belgium	http://info.fra.chello.be/	**Chello**: affiliate of UPC group, United Pan-Europe Communications, provides Internet large band communication access.
be	Belgium	http://www.kpn.be/	**KPN**: in Belgium offers a wide range of high-quality telecom and business services (voice communications, data/IP, Internet and international services).
be	Belgium	http://www.ecco.be/	**European Consulting Company** – ECCO: specialised in European public affairs. Areas: Trade & Commercial Policy, Agri-business, Consumer Affairs & Food Law, Environment and Waste Policy, Internal Market and Industrial Affairs, Competition Policy; Identifies policy trends of importance, and advise on possible courses of action. Representing the interests of hundreds of large and small companies across Europe.
	Belgium	http://www.cimo.be/	**Freshfel Europe**: European Association for the fresh produce industry (was set up on the basis of CIMO, the former European Association of Fresh Produce Importers, and EUCOFEL, the European Union of the Fruit and Vegetable Wholesale, Import and Export Trade).
be	Belgium	http://www.ruca.ua.ac.be/	**University of Antwerp** (international Relations Office)
bg	Bulgaria	http://www.einet.bg/bg/	**Eurointegra:** Internet Service Provider, implementation and support of full range network services, analysis, design and development of ad-hoc software
ca	Canada	http://www.agric.gov.ab	**Alberta agriculture, food**

Domain	Country	Visitor Website	Website Description
		.ca/; http://www.gov.ab.ca/home/about_alberta/industries.cfm	**and rural development:** Alberta (a Canadian Province) has a vital and diverse business community. It includes not only oil and gas, but several other thriving industries: Forestry, Telecommunications, Agriculture, Tourism.
ca	Canada	http://www.attcanada.ca/index.html;	**AT&T Canada**: Internet and E-Business Services.
ca	Canada	http://dfait-maeci.gc.ca/	**Department of Foreign Affairs and International Trade** (DFAIT): responsible for Canada's international business and export development. (*in French : Ministère des Affaires étrangères et du Commerce international - MAECI*).
ca	Canada	http://www.hydro.qc.ca/	**Hydro Quebec**: supplies electricity to over 3.5 million Québec customers. The company also does business with dozens of power companies in north-eastern North America and participates in energy-related infrastructure projects on several continents
ch	Switzerland	http://www.unibe.ch/	**University of Bern**.
ch	Switzerland	http://www.admin.ch/	**Federal authorities of the Swiss confederation.**
cl	Chile	http://www.puc.cl/	**Pontifica Universidad Católica de Chile**.
cl	Chile	http://www.prochile.cl/	**Dirección de Promoción de Exportaciones** (ProChile – Ministry of External Relations): promotion and development of exports for Chilean enterprises, by contributing to diversify and stimulate the exports of products and services.
de	Germany	http://www.basf-ag.de/	**BASF**: one of the world leaders in the chemical industry.
es	Spain	http://www.upv.es/	**Universitat Politècnica de Valencia.**
fr	France	http://www.apcm.fr/	**APCM**: Chambre de métiers.
fr	France	http://www.educagri.fr/	**Educagri.fr**: site de l'enseigement agricole public français
fr	France	http://www.ensat.fr/	**INP (ENSAT)**: École Nationale Supérieure Agronomique de Toulouse.

Domain	Country	Visitor Website	Website Description
fr	France	http://www.lip6.fr/	**Paris VI University** (Université Pierre et Marie Curie).
fr	France	http://www.dpa.finances.gouv.fr/	**Ministry of the Economy, Finance and Industry**.
fr	France	http://www.univ-tlse1.fr/	**University of Toulouse** (*Université des Sciences Sociales*).
it	Italy	http://www.interbusiness.it/	**Telecom Italia Group** (TIM) / Internet Service branch: which has a focus on wireless telephony, especially in Latin America, building the first Pan American GSM network.
it	Italy	http://www.uniroma1.it/	**La Sapienza (Universita degli Studi di Roma)**
Jp	Japan	http://www.mri.co.jp/E/index.html	**Mitsubishi Research Institute**: Survey & research and consulting services on a variety of themes pertaining to corporate activity and policy development.
Jp	Japan	http://www.env.go.jp/	**Ministry of the environment**
kg	Kyrgyzstan	http://www.aknet.kg/	**Aknet**: Communication and Internet service provider
lu	Luxembourg	http://www.vo.lu/	**Visual online**: Communication and Internet service provider
nl	Netherlands	http://www.agro.nl/	**AgroNet:** Internet information services network on Agriculture, Nature management, and fisheries.
nl	Netherlands	http://www.minbuza.nl/	**Ministry of Foreign Affairs**
nl	Netherlands	http://www.uva.nl/	**University of Amsterdam**
pe	Peru	http://milliweb.millicom.com.pe/	**Millicom International Cellular** (MIC): international operator of cellular telephony services, primarily in emerging markets where the basic telephone service is often inadequate and where economic development and change are creating new demand for communication services.
se	Sweden	http://www.liu.se/	**Linköpings University**
uk	U.K.	http://idpm.man.ac.uk/	**IDPM**: Institute for Development Policy and

Domain	Country	Visitor Website	Website Description
			Management (University of Manchester).
uk	U.K.	http://www.dfid.gov.uk/	**DFID** (through UK online.Gov): Department for International Development, promotes international development and the reduction of poverty
uk	U.K.	http://www.hw.ac.uk/	**Heriot Watt University.**
uk	U.K.	http://www.mcc.ac.uk/	**Manchester Computing** (MC): provides local academic computing to the University of Manchester. MC is a National Centre for Datasets Services (MIMAS), and is also a National Supercomputer Centre providing very high performance services to peer-reviewed research workers (CSAR).
uk	U.K.	http://www.ucl.ac.uk/	**University College London**
uk	U.K.	http://www.co.uk/	**Woolworth Group Plc**: UK retailer focused on the home, family and entertainment.
za	South Africa	http://www.uct.ac.za/	**University of Cape Town**

Table 23.2: Details of Visits through Internet Service Providers or Web Search services

Domain	Country	Visitor Website	Website Description
com		http://www.altavista.com/	**Altavista**: Web search service.
		http://www.btopenworld.com/	**Btopenworld**: Internet service provider.
		http://www.google.com/	**Google**: Web search service.
		http://www.inktomi.com/	**Inktomi Search**: global provider of information-retrieval solutions, including enterprise search and categorization software, and Web search services, providing highly relevant search capabilities for leading consumer portals, Internet destinations and e-commerce sites worldwide.
		http://www.rr.com/	**Road Runner**: owned and operated by Time Warner Cable, is a broadband service

Domain	Country	Visitor Website	Website Description
			providers.
		http://www.directhit.com/	**Teoma**: Web search service.
	Belgium	http://www1.worldcom.com/uunet/	**UUNET**: a WorldCom company, provides Internet communications, voice and data services.
net		http://services.bellsouth.net/ http://home.eircom.net/	**Bellsouth**: Internet service provider. **Eircom Net**: Internet service provider.
		http://www.looksmart.net/	**Looksmart**: Web search service
		http://www.level3.net/	**Level3**: Communication and Internet service provider.
		http://www.nerim.net/	**Nerim**: Internet service provider.
		http://www.virgin.net/	**Virgin**: Internet service provider.
	Chile	http://www.terra.com/compras/index.html	**Terra (Terra-Lycos Network)**: global Internet company and provider of Internet access and interactive content and services to the Spanish- and Portuguese-speaking world. Terra's Portals offer users the widest variety of local and global content and services.
	France	http://www.proxad.net/	**Proxad**: Communication and Internet service provider.
	Germany	http://www.mediaways.net/	**Mediaways**: Internet service provider.
	Malaysia	http://www.jaring.my/	**Jaring**: Malaysia company providing Internet service and access.
	Norway	http://www.fastsearch.net/	**Fast (Fast Search & Transfer)**: content delivery and information, data, and media retrieval
ar	Argentina	http://www.com.ar/	**Www.com.ar**: Internet and E-mail service provider in Latin America.
be	Belgium	http://www.skynet.be/	**Belgocom-Skynet**: Belgium company providing wide range of internet services.
be	Belgium	http://www.win.be/	**Win**: Communication and Internet service provider.

Domain	Country	Visitor Website	Website Description
be	Belgium	http://www.easynet.be/	**Easynet**: pan-European Internet Service Provider and telecommunications company.
be	Belgium	http://www.edpnet.be/fr/	**EDPnet:** Communication and Internet service provider.
be	Belgium	http://www.planetinternet.be/fr/	**Planet internet**: Communication and Internet service provider.
be	Belgium	http://breedband.telenet.be/	**Telenet**: Belgium's cable network operator, including high-speed broadband data services.
be	Belgium	http://www.xs4all.be	**XS4ALL**: Belgian company providing range of internet accounts for access, mail and hosting. Has KPN as partner.
ca	Canada	http://www1.sympatico.ca/	**Sympatico.ca**: Internet service provider.
ch	Switzerland	http://www.cablecom.ch/fr/home.html	**CableCom**: cable telecommunications services.
cl	Chile	http://www.tie.cl/	**Tie (Telefonica Internet Empresas)**: Communication and Internet service provider.
fr	France	http://www.club-internet.fr/	**Club-Internet**: Internet service provider.
fr	France	http://www.completel.fr/	**Completel**: High-speed telecommunication and internet service provider.
fr	France	http://www.transpac.fr/fre/oleane/homepage	**France telecom (Oléane)**: Internet service provider.
fr	France	http://www.wanadoo.fr	**Wanadoo**: Internet service provider.
de	Germany	http://www.t-online.de/	**T-Online**: Information service provider.
de	Germany	http://www.vianetworks.de/	**Via Net.works**: Internet service provider.
es	Spain	http://www.retevision.es/	**Retevisión**: Communication and Internet service provider.
jp	Japan	http://www.ne.jp/	**ASAHI-Net**: Communication and Internet service provider.
nl	Netherlands	http://www.demon.nl/	**Demon**: Internet service provider.
nz	New Zealand	http://www.telstraclear.co.nz/	**TelstraClear**: New Zealand's full service telecommunications

Domain	Country	Visitor Website	Website Description
			company, providing innovative market leading products, services and customer focus to the business, government, wholesale and residential sectors.
pl	Poland	http://www.internetia.pl/	**Interetia**: Internet service provider.
pt	Portugal	http://www.netcabo.pt/	**Net Cabo**: TV and Internet Network cable access services.
pt	Portugal	http://home.telepac.pt/	**Telepac:** Internet and application service provider.
pt	Portugal	http://www.vianetworks.pt/	**Vianet.works:** Internet service provider.
ro	Romania	http://www.xnet.ro/	**Xnet**: Communication and Internet service provider.

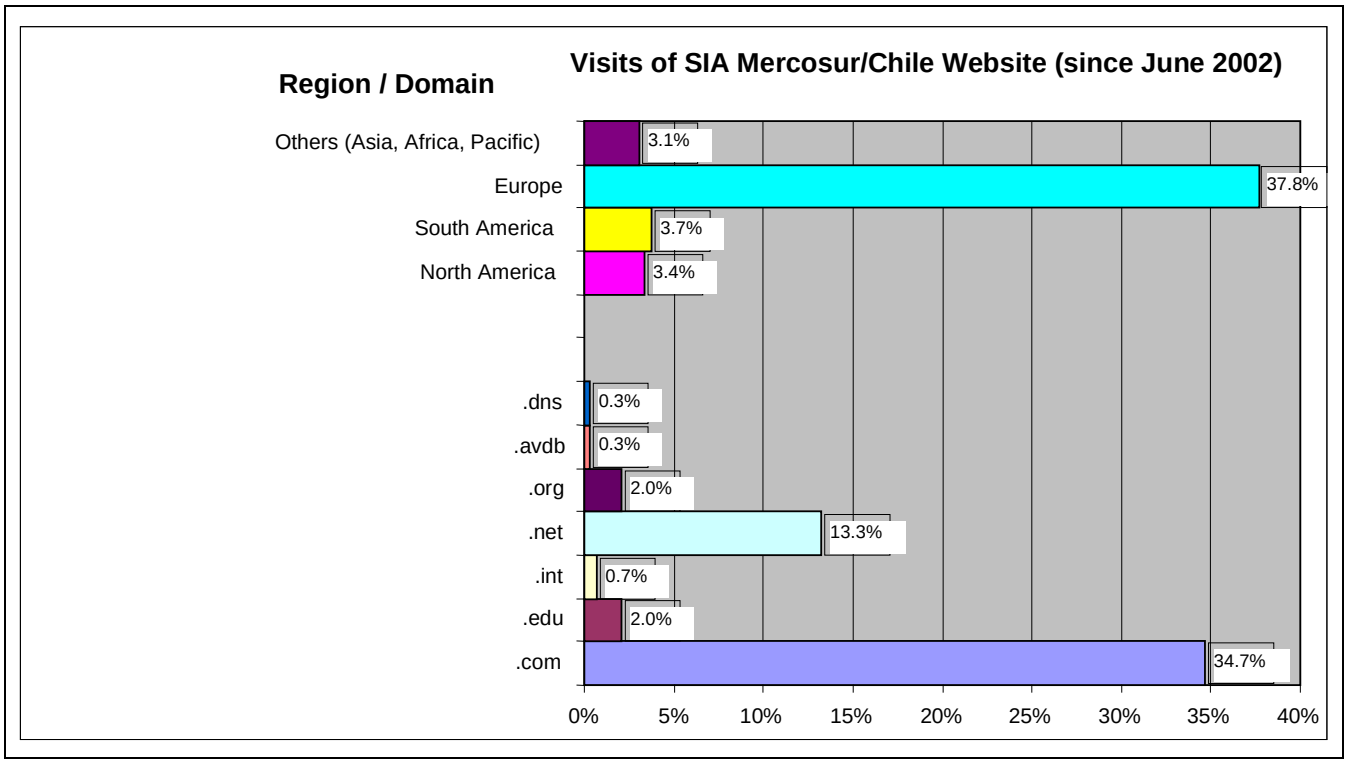
Table 23.3: Summary of visitors' Website by sector of activity

Sector of activity	Number of identified websites	In %
Advice on public affairs	3	2.7
Agriculture, Fisheries, Food industry	5	4.4
Education, Universities, Research institutes	24	21.2
Energy	1	0.9
Finance	2	1.8
Government Portal, International organisation	12	10.6
Information Technology, Telecommunication, Data Network operators	22	19.5
Internet Service Provider or Web Search services	44	38.9
	113	100.0

It is worth to note the proportion of visitors' Website belonging to the sector of activity "*Information Technology, Telecommunication, Data Network operators*". The interest of this category of visitors to the project Website is in line with the expansion of telecoms sector in Chile during recent years, as described in Section 15 (Sector study: Services, Foreign Direct Investment and Intellectual Property).

Furthermore, among the identified websites most of visitors where from Europe, or belonged to a '.com' Website domain.

Table 23.4: Summary of visitors' Website by Region / Domain



Concerning the Bulletin Board, the following Forums were defined:

- SIA project reports, for comments about the reports elaborated in the framework of the Mercosur/Chile SIA project;
- SIA Methodology and tools, for Comments and questions regarding the SIA methodology, its application and analysis tools used;
- Environmental sustainability issues;
- Social and economic sustainability issues;
- Suggestions and General comments, for information and suggestions to share, or other issues that do not seem to fit elsewhere;

So far no discussion topic was posted by anyone. It will be replaced by a simple "feedback" function.

24. Technical overview of the GTAP computational model

24.1 Introduction

This annex provides an overview of the basic structure of the global CGE model employed for assessment of the economic effects of a EU-Chile FTA. The model is a standard multi-region computable general equilibrium (CGE) model. The reader is referred to Hertel (1996: http://www.agecon.purdue.edu/gtap/model/Chap2.pdf) for a detailed discussion of the basic algebraic model structure represented by the GEMPACK code. The capital accumulation mechanisms are described in Francois et al. (1996: http://www.agecon.purdue.edu/gtap/techpapr/tp-7.htm). The model is implemented in GEMPACK – a software package designed for solving large applied general equilibrium models. The model is solved as an explicit non-linear system of equations, through techniques described by Harrison and Pearson (1994). More information can be obtained at the following URL – http://www.monash.edu.au/policy/gempack.htm. Social accounting data are based on Version 5 of the GTAP dataset (GTAP 2001), with an update to reflect post-Uruguay Round protection as discussed in the body of the report. The full set of model files are available upon request.

The national accounts data have been organized to 26 sectors and 10 regions. The sectors and regions for this 26x10 aggregation of the data are detailed in A.1 below.

The data come from a number of sources. Data on production and trade are based on national accounting data linked through trade flows and drawn directly from the Global Trade Analysis Project (GTAP) version 5 dataset. (GTAP 2001). (See Reinert and Roland-Holst 1997 for a discussion of the organization of such data for CGE models). The GTAP version 5 dataset is benchmarked to 1997, and includes detailed national input-output, trade, and final demand structures. Significant modifications have been made to the basic GTAP database. The basic social accounting and trade data are supplemented with trade policy data, including additional data on tariffs and non-tariff barriers. We have updated the dataset to better reflect actual import protection for goods and services. (For example, the basic GTAP database includes no information at all on trade barriers for services).

24.2 General structure

The general conceptual structure of a regional economy in the model is represented in Figure A.1. Within each region, firms produce output, employing land, labour, and capital, and combining these with intermediate inputs. Firm output is purchased by consumers, government, the investment sector, and by other firms. Firm output can also be sold for export. Land is only employed in the agricultural sectors, while capital and labour (both skilled and unskilled) are mobile between all production sectors. Capital is fully mobile within regions. However, capital movements between regions are not modelled, but rather are held fixed in all simulations. Labour mobility is discussed below.

All demand sources combine imports with domestic goods to produce a composite good, as indicated in Appendix Figure A.1. In constant returns sectors, these are Armington composites. In increasing returns sectors, these are composites of firm-differentiated goods. Trade elasticities are also presented in Appendix Table 2.

24.3 Dynamics

An important feature of the model involves a dynamic link, whereby the static or direct income effects of trade liberalization induce shifts in the regional pattern of savings and investment. These effects have been explored extensively in the trade literature, including Baldwin and Francois (1999), Smith (1976, 1977), and Srinivasan and Bhagwati (1980). Several studies of the Uruguay Round have also incorporated variations on this mechanism. Such effects compound initial output welfare effects over the medium-run, and can magnify income gains or losses. How much these "accumulation effects" will supplement static effects depends on a number of factors, including the marginal product of capital and underlying savings behavior. In the present application, we work with a classical savings-investment mechanism (discussed briefly in the appendix, and also in Francois et al 1997). This means we model medium- to long-run linkages between changes in income, savings, and investment. The results reported here therefore include changes in the capital stock, and the medium- to long-run implications of such changes.

24.4 Taxes and policy variables

Taxes are included in the theory of the model at several levels. Production taxes are placed on intermediate or primary inputs, or on output. Some trade taxes are modelled at the border. Additional internal taxes can be placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Where relevant, taxes are also placed on exports, and on primary factor income. Finally, where relevant (as indicated by social accounting data) taxes are placed on final consumption, and can be applied differentially to consumption of domestic and imported goods.

Trade policy instruments are represented as import or export taxes/subsidies. This includes applied most-favored nation (MFN) tariffs, antidumping duties, countervailing duties, price undertakings, export quotas, and other trade restrictions. The one exception is service-sector trading costs, which are discussed in the next section.

Basic data on current tariff rates come from the UNCTAD and WTO data on applied and bound tariff rates. These are integrated into the core GTAP database. These are supplemented with data from USTR and USITC on regional preference schemes in the Western Hemisphere. For agriculture, protection is based on OECD and USDA estimates of agricultural protection, as integrated into the GTAP core database. Tariff and non-tariff barrier estimates are further adjusted to reflect remaining Uruguay Round commitments, including the phase-out of remaining textile and clothing quotas under the Agreement on Textiles and Clothing (the ATC). Data on post-Uruguay Round tariffs are taken from recent estimates reported by Francois and Strutt (1999). These are taken primarily from the WTO's integrated database, with supplemental information from the World Bank's recent assessment of detailed pre- and post-Uruguay Round tariff schedules. All of this tariff information has been concorded to our model sectors. Services trade barriers are based on the estimates described below.

24.5 Trade and transportation costs

International trade is modelled as a process that explicitly involves trading costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as the physical activity of transportation itself. Those trading costs related to international movement of goods and related logistic services are met by

composite services purchased from a global trade services sector, where the composite "international trade services" activity is produced as a Cobb-Douglas composite of regional exports of trade and transport service exports. Trade-cost margins are based on reconciled f.o.b. and c.i.f. trade data, as reported in version 4 of the GTAP dataset.

A second form of trade costs is known in the literature as frictional trading costs. These are implemented in the service sector. They represent real resource costs associated with producing a service for sale in an export market instead of the domestic market. Conceptually, we have implemented a linear transformation technology between domestic and export services. This technology is represented in Appendix Figure A.2. The straight line AB indicates, given the resources necessary to produce a unit of services for the domestic market, the feasible amount that can instead be produced for export using those same resources. If there are not frictional barriers to trade in services, this line has slope -1. This free-trade case is represented by the line AC. As we reduce trading costs, the linear transformation line converges on the free trade line, as indicated in the figure.

24.6 Production structure

The basic structure of production is depicted in Appendix Figure A.3. Intermediate inputs are combined, and this composite intermediate is in turn combined in fixed proportions with value added. This yields sectoral output Z. The value-added substitution elasticities (between capital and labor) are presented in Annex 1 (Table A.1).

24.7 The composite household and final demand structure

Final demand is determined by an upper-tier Cobb-Douglas preference function, which allocates income in fixed shares to current consumption, investment, and government services. This yields a fixed savings rate. Government services are produced by a Leontief technology, with household/government transfers being endogenous. The lower-tier nest for current consumption is also specified as a CDE [constant difference elasticity] demand function. The regional capital markets adjust so that changes in savings match changes in regional investment expenditures. (Note that the Cobb-Douglas demand function is a special case of the CDE demand function, as is the CES or constant elasticity of demand specification. It is implemented through GEMPACK parameter files.)

24.8 Labour markets

Our default closure involves modelling labour markets as clearing with flexible wages. This fits with our “long-run” approach, where labour markets tend to be more flexible. We specify a situation where the basic structural rigidities of labor markets (and the aggregate employment levels employment implied) are unaffected by the simulations in the long-run However, in implementation the mobility of labour between sectors is slightly "sluggish" in the sense that there is not a perfectly linear transform technology for movement of labour between sectors. This represents the assumption that for institutional reasons (and because some skills are sector specific), labour is not fully flexible in its application across sectors. We view this as a reasonable representation of labour markets. To the extent that wage rigidities are important, the direction of aggregate employment effects may be inferred from wage effects. (Hertel 1996 refers to this as "sluggish" factor movements). Theoretical discussion of factor mobility, along the lines developed in Hertel and employed here, can be found in Casas (1984). It should be noted that in practice the transformation elasticities are set very high (-25.0) but not infinitely so. This effectively allows for “essentially” full mobility. (It also speeds up finding numeric

solutions without changing the substantive results.) Values for these parameters can be found in Annex 1 (Table A.1), which provides a summary of several relevant elasticities[97].

24.9 Services Barriers

The basic methodology involves the estimation of sector-specific gravity equations vis-à-vis global trade levels. Basically, we take GTAP bilateral trade data, and fit it to a simple gravity model of total imports by country. In this case, these equations have been estimated at the level of aggregation corresponding to the model sectors.

The gravity equations are estimated using ordinary least squares with the following variables:

$$(1) \quad X_i = a_1.\ln(POP_i) + a_2.\ln(PCGDP)_i + a_3.\ln(PCGDP)_i^2 + \varepsilon_i$$

where X_i represents imports from the world, *POP* represents population, and *PCGDP* per-capita income in the importing country.

In the regressions, we break out the most open markets, notably Hong Kong, as free trade "benchmarks" in the regressions. Deviations from predicted imports, relative to this free trade benchmark, are taken as an indication of barriers to trade. These tariff equivalent rates are then backed out from a constant elasticity import demand function as follows:

$$(2) \quad \frac{T_1}{T_0} = \left[\frac{M_1}{M_0}\right]^{\frac{1}{e}}$$

Here, T_1 is the power of the tariff equivalent $(1+t_1)$ such that in free trade $T_0 = 1$, and $[M_1/M_0]$ is the ratio of actual to predicted imports (normalized relative to the free trade benchmark ratio for Hong Kong, as discussed above). This is a reduced form, where actual prices and constant terms drop out because we take ratios. The term e is the demand elasticity (with values as suggested by the relevant trade substitution elasticities in Annex 1 (Table A.2). For the model sectors, tariff equivalents for services for the EU : Chile are Wholesale, retail, restaurants, hotels, transport, and other communications services (0.0:8.5), Construction (4.6:18.3), Business Services (2.9: 6.5), Other Services (2.9:6.5). These estimates apply only to cross-border services trade, and not establishment/FDI-based trade.

24.10 The Experiment

The policy experiment for the FTA assessment is discussed in the report. The main features of the experiment are summarized in Table 8.3.

[97] Elasticities to be included

Table A.1: Model Parameters

Model Sectors	Elasticity of substitution in value added	Trade substitution elasticities
grains	0.2	2.2
other agriculture	0.2	2.4
cattle	0.2	2.8
mining	0.2	2.8
forestry	0.2	2.8
fisheries	0.2	2.8
dairy	0.6	2.2
meats	1.1	2.2
processed foods	1.1	2.2
beverages and tobacco	1.1	3.1
textiles	1.3	2.2
clothing	1.3	4.4
leather	1.3	4.4
wood, pulp, and paper	1.3	2.1
chemicals	1.3	1.9
refineries	1.3	1.9
Steel	1.3	2.8
non-ferrous metals	1.3	2.8
motor vehicles	1.3	5.2
Electronics	1.3	2.8
other machinery	1.3	3.0
other manufactures	1.3	2.8
Wholesale, retail, restaurants, hotels, transport, communications	1.6	1.9
construction	1.4	1.9
business services	1.3	1.9
other services	1.3	2.0

Note: The transformation elasticity for mobility of labor between sectors in the GTAP framework is set at -25 for skilled and unskilled labor.

Figure A.1 : Armington Aggregation Nest

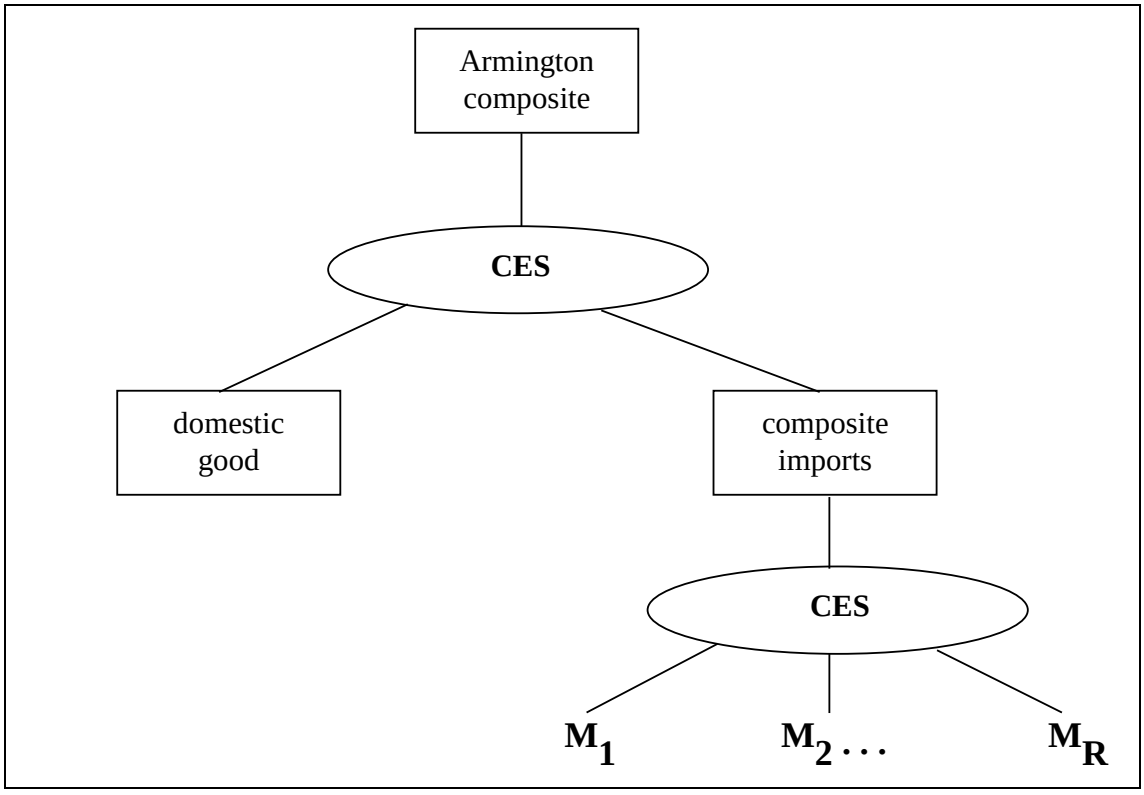


Figure A.2: Trading Costs in the Service Sector

Frictional trading costs (implemented in the service sector) represent real resource costs associated with producing a service for sale in an export market instead of the domestic market. The straight line AB indicates, given the resources necessary to produce a unit of services for the domestic market, the feasible amount that can instead be produced for export using those same resources. If there are not frictional barriers to trade in services, this line has slope -1. This free-trade case is represented by the line AC. As we reduce trading costs, the linear transformation line converges on the free trade line, as indicated in the figure. See also section 24.5 for more explanation.

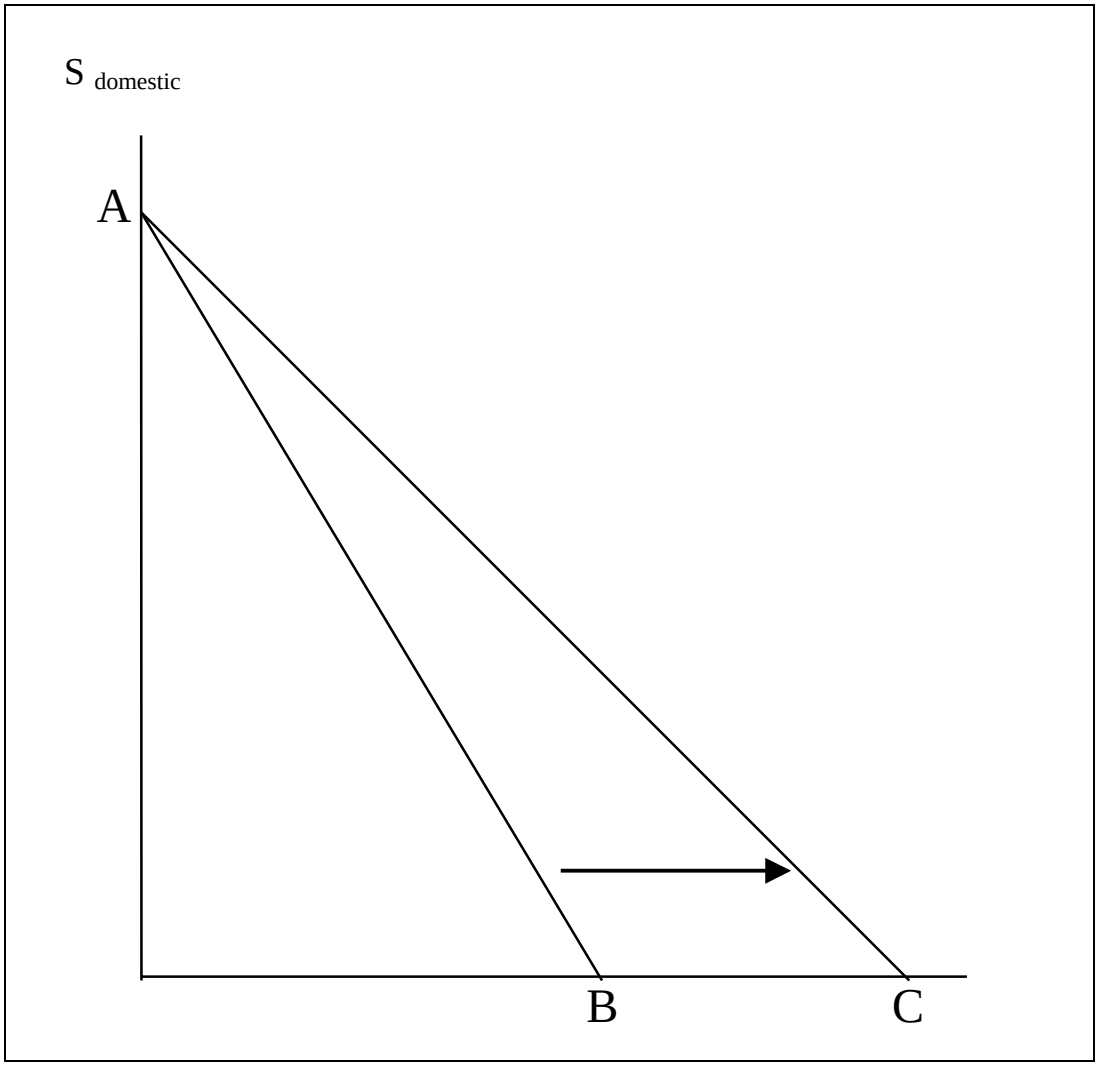
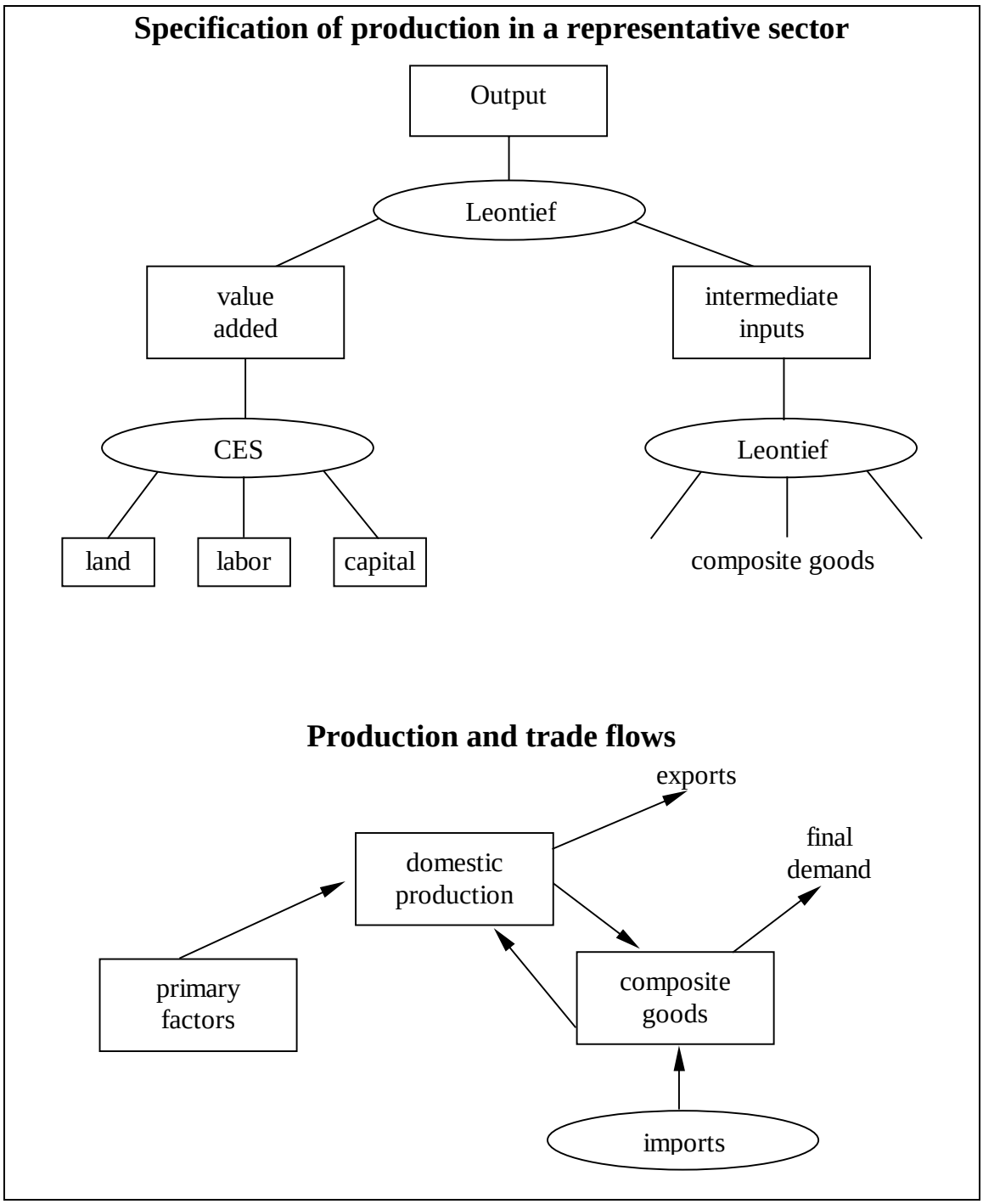


Figure A.3: Basic Features of the Simulation Model



25. Review of Previous Studies

This section gives an overview of some of the most relevant papers related to the impact of trade negotiations on sustainable development. The literature review will continue throughout the study, examining a number of the wide range of relevant papers that have been produced in the last few years. A list of references is given at Annex 3.

This literature review is organized in three sections.

Section 25.1 deals with the SIA methodology. We first present an overview of ground papers used to develop our SIA methodology. We mostly based our methodology on the framework developed by Kirkpatrick and others. We examined alternative views of major non-governmental involved in sustainable development, such as the World Wide Foundation.

Section 25.2 gives some quantitative estimations of the impact of trade integration in Latin America. A first set of studies is based on a GTAP framework, comparable to the one used in this report. A second group of studies is based on other CGE models.

The last section (25.3) deals with sustainability concerns. Environmental considerations are first presented, in particular the link between trade and environment. The complex relationship between gender disparities and trade agreements is also considered.

25.1 The SIA methodology

This section deals with methodological concerns. Major contributions dedicated to the SIA methodology are presented. The methodological discussion above is closely based on these works.

The SIA methodology is mostly based on three Manchester team contributions: Phase One Report[98], Phase Two Report[99] and Phase Three Report[100].

In the present Chile SIA, the methodological framework used is based on the first two contributions. These two papers, which describe the SIA methodology, are de facto included in part A of this report. In this section, we will focus on the third contribution, the Phase III Report, which presents further development of the SIA methodology, some of which have not been included in the present Chile SIA Report.

The Phase Three Report provides for an ongoing process during the post-Doha negotiations period. The SIA framework is intended to allow assessment of the sustainability impact of negotiations in each of the areas included in the Declaration of Doha and of the Agenda as a whole, thereby informing and assisting negotiations throughout the period leading up to the Special Session of the Ministerial Conference.

In the Phase III Report, the SIA methodology is 'refined and developed' from the preliminary SIA methodology described in the Phase One and Phase Two

[98] Kirkpatrick C. and N. Lee, 1999, *WTO New Round Sustainable Impact Assessment Study: Phase 2 Main Report*, University of Manchester, Institute for Development Policy and Management and Environmental Impact Assessment Centre.

[99] Kirkpatrick C., N. Lee and O. Morrissey, 1999, *WTO New Round Sustainable Impact Assessment Study: Phase 1 Report*, University of Manchester Institute for Development Policy and Management and Environmental Impact Assessment Centre.

[100] Kirkpatrick, Colin and Norman Lee, 2002, *Further Development of the Methodology for a Sustainable Impact Assessment of Proposed WTO Negotiations*, University of Manchester Institute for Development Policy and Management

reports. These refinements and adaptations are designed to make it applicable to the somewhat different and more detailed requirements of SIAs in the 'post-Agenda setting' stages of the New Round trade negotiations.

The main methodological refinements proposed in the Stage Three Report relate to the distinction between global and sectoral SIA and assessment tools.

25.1.1 Global and sectoral SIAs

The first methodological refinement given in the Phase III Report relates to the distinction between two different types of SIA: global SIAs and sectoral SIAs. These are complementary forms of assessment, which share many common characteristics, but there are also some significant differences.

In describing the new methodology for 'full' assessments, we have endeavoured to indicate both its consistency with the methodology used in the completion of the earlier 'preliminary' assessments and the additional, different and/or more detailed requirements, which it now contains.

Both methodologies share the same underlying principles. Each is targeted on the SIA requirements at the particular stages in the negotiating process in which their resulting assessments are to be used. Both, also, have to take account of the real world constraints within which their respective assessments will have to be prepared. These constraints include: the limited availability of appropriate 'on the shelf' assessment tools; of appropriate, reliable data for use with these tools; and limitations in time and resources for delivering assessments within the relatively tight schedules of the trade negotiation process.

- **Global SIAs**

  Two global SIAs are to be undertaken.

  - The preliminary global SIA, to be undertaken at the commencement of the contract, should provide an overview of the potential impact on sustainability of all of the proposed sectoral measures, taking into account potential impacts associated with inter-sectoral linkages. This is intended to assist in determining the more detailed sectoral assessments to be undertaken. It is proposed that this should be undertaken within a global screening and scoping update.
  - The second global SIA, to be undertaken after all of the individual sectoral agreements have been reached, but before their final adoption, is a final global SIA. It will draw upon the completed assessments of the individual sectoral assessments, but also incorporate any inter-sectoral impacts, which may have been overlooked, in completing an SIA of the overall significant impacts of the New Round as a whole.

- **Sectoral SIAs**

  Eight sectoral SIAs are to be completed, two per year over a four-year programme period. Each sectoral SIA will relate to a separate trade measure or group of related measures, which are to be the subject of a separate agreement within the New Round framework. The selection and scheduling of these sectoral SIAs is to be agreed with the Commission, taking the findings of the preliminary global SIA into account.

- **Main stages for full assessments**

  The proposed main stages in the SIA process for full assessments are:

  - Stage 1: Screening and scoping update

- Stage 2: Detailed assessment of proposed measures
- Stage 3: Assessment of alternative mitigation and enhancing (M and E) measures (i.e. options analysis)
- Stage 4: Monitoring and post-evaluation proposals.

Each of these stages is examined below for sectoral measures and, where relevant, for global measures. As shown in Table below, these stages differ from those in preliminary SIAs.

Preliminary SIAs	Full SIAs
Screening	Screening and Scoping Update
Scoping	Detailed Assessment
Preliminary Assessment	Mitigation and Enhancement Analysis
(Mitigation and Enhancement Analysis)*	(Monitoring and Post-Evaluation)*

* Limited analysis only

* Formulation of MPE proposals only

The scheduling of the SIA process for each trade measure should ideally correlate with the scheduling of its negotiation. The SIA process should commence sufficiently early to enable the sustainability appraisal itself, and the consultations based upon it, to be completed in sufficient time for negotiators to take them fully into account before any agreement is reached and later approved.

25.1.2 Assessment tools: sustainability indicators

In the Phase III Report, refinements have also been made concerning sustainability indicators. The rationale for the proposed framework for sustainability indicators is to better assist decision-making relating to the sustainable development objective.

The following criteria guided the selection of the indicators.

- They should be limited in total number but, in aggregate they should be comprehensive in their coverage of the goals of sustainable development.
- They should be balanced in their coverage of economic development, social development and environmental quality / resource conservation.
- They should reflect concerns relating to inter-generational and intra-generational equity.
- They should focus on key components of concern to decision-makers and stakeholders.

Two types of sustainability indicators are proposed in the Phase Three Report.

- Target indicators are used to reflect the final impact in terms of the goals of sustainable development.
- Process indicators provide an additional means of assessing impact on sustainable development, and are particularly relevant when assessing short and long-term impacts, which may not be adequately captured by target indicators.

Indeed, the characteristics of sustainable development are identified as key procedures, processes and practices, which are needed to progress towards the long-term goal of sustainable development. Process indicators can be used

to assess the changes in, or impact on, these sustainable development characteristics, which result from the policy measures being assessed in the SIA study.

Two types of core process indicators are proposed for use in the full SIA studies in Phase Three.

- Indicators aiming at assessing whether proposed trade policy and/or mitigation and enhancement measures are consistent with sustainable development principles and whether they are likely to assist the countries affected to move towards a more sustainable development path in the longer term.
- Indicators aiming at determining whether the proposed measures are likely to enhance institutional capacities and willingness to move, in the longer term, to more sustainable forms of development.

For both the target and process core indicators, a number of second-tier indicators are introduced, which are components of the core indicators. The second-tier indicators are only indicative and should be adapted to the circumstances of the particular case.

The list of core and second-tier indicators is given in Table 5.1 of the present report (Section 5: Indicators and assessment).

25.2 Quantitative estimations of the impact of trade integration in Latin America

This section is dedicated to quantitative estimations of the impact of different Trade Agreements in Latin America Countries. These estimations are carried out with CGE models. The purpose of this review is to summarize the expected impacts of the different trade agreements currently under negotiations. This might enable us to compare some of our results to those of previous studies, and also to provide additional information concerning the evolution of the European and Chilean situation.

25.2.1 GTAP studies

i. Diao X., E. Díaz-Bonilla, and S. Robinson, 2001[101]

In this contribution, Diao and others use a GTAP model to estimate the impact of two different trade agreements on Latin America Countries: the Free Trade Area of the Americas and the agreement between Mercosur and the European Union.

Since the mid-1980s, trade liberalization and economic integration in the Americas has been progressing at a steady pace. Liberalization initiatives have been launched at several levels. Reduction of trade barriers occurred multilaterally, as a result of GATT/WTO negotiations; regionally, as a consequence of different trade agreements in the American continent; and unilaterally, depending on specific liberalization programs in different countries.

In their paper, the authors focus on two regional trade agreements under discussion: the Free Trade Area of the Americas (FTAA) and the agreement

[101] Scenarios for Trade Integration in the Americas, International Food Policy Research Institute (IFPRI), draft Paper, November 2001.

between Mercosur and the European Union (FTMEU). Basing on a computable general equilibrium (CGE) framework, they simulate the economic impact of these agreements on Latin America Countries (LAC), and other world regions.

- Methodology

  Each trade agreement is simulated as a total elimination of trade barriers in all sectors across the participating regions or countries. However, it is assumed that US, Canada and the EU will maintain their support to agriculture[102].

  Other ongoing trade negotiations, for instance related to EU enlargement or to the Cotonou Agreement, are not taken into account. The results obtained here therefore have to be considered as an upper bound for possible impact on Mercosur countries.

  Simulations are technically implemented with a CGE framework, namely the static Global Trade Analysis Project (GTAP), version 5, framework. The model includes 29 countries/regions and 38 products.

  One interesting feature of this framework is the possibility of differentiating the labour market modelling. For developed countries or regions, like the US, Canada and the EU, labour markets are run with full employment, while the LAC countries are modelled in an unemployment mode, with real rigidities.

  The model specification is the standard one, except for two added assumptions.
  Contrary to standard classical theory, money is not neutral. First, because of rigidities, monetary fluctuations can have real effects. Secondly, money can be considered as an argument in the production function. In the GTAP model, the role of money is taken into account with a cash-in-advance technology specification.

  In line with the new trade theory[103], trade liberalization has a positive impact on productivity through three different channels: learning-by-doing and knowledge accumulation, a greater availability of better capital and inputs, increased competition. The model allows for these effects by including a technology shift in the production functions, which is linked to the level of exports and imports.

- Results

  The simulations predict FTTA and FTMEU to have a positive impact on participants. In general, the gains are larger for the LAC than for the large participants.

  On the whole, amongst LAC, the estimated impact of trade agreements is smaller for countries that are already open to international trade (Chile), or that have access by now to large foreign markets (Mexico).

  Both trade agreements generate an increase in GDP for all participating countries. This augmentation is especially beneficial to Argentina (+7% for FTTA and + 7.9% for FTMEU), Brazil (+4.7% and + 4.8%), Uruguay (+3.7% and + 4.4%), but less to Chile (+2.3% and + 2.7%).

[102] These countries indicated that they would not eliminate support to agriculture, except in multilateral negotiations.

[103] This new trade theory uses the insights of the endogenous growth theory developed by Paul Romer in the mid-80s.

In the same time, FTTA and FTMEU both cause a small GDP decline in other geographic areas, mostly in Asia. Changes in consumption follow the same pattern.

The impact of trade agreements on the labour markets is differentiated according to the modelling used.

- In full-employment modelled countries, adjustments in the CGE model depend on the wage variable. The impact on wages is positive but weak (but below 1%) for participants; USA, Canada, and EU. Both agreements generate a slightly decrease in unskilled wages elsewhere in the world, mostly in Asia for the FTAA.

- In LAC, where rigidities have been taken into account, adjustments in the model depend on the employment variable. Job creations, both skilled and unskilled, are sensible, especially for Argentina (+5-6% of employment), Uruguay (+4-5%), Brazil (+2-3%). Once again, the figure is smaller for Chile (+1-2%) and Mexico (below1%).

- FTAA and FTEU both generate net trade creation, with the former impact on world trade being twice more significant than that of the latter. FTTA creates an additional trade amounting for 0.7% of total world trade, and generates an only 0.02% trade diversion. The FTMEU leads to an increase of 0.35% of the world trade, along with a 0.02% decrease of trade in the non-participating countries.

- Conclusion

The authors conclude that FTAA and FTEU are globally advantageous. They will have positive effects on LAC and on other participating countries, while the negative effect on other geographic areas are of much lesser magnitude.
However it should be kept in mind that, because the model does not allow for other ongoing trade agreements, these results have to be interpreted with care.
The authors also recognize that their work should be extended in two directions. First, the impact on poverty should be assessed. Secondly, the influence of structural adjustment and macro stabilization programs should be taken into account.

ii. G.W. Harrison, T.F. Rutherford and D.G. Tarr, 2001[104]

Harrisson and others use a GTAP model to compare different trade policy options for Chile. Different forms of integration between Chile and Mercosur, and Chile and NAFTA are considered - customs union, free trade area - and compared to multilateralism.

The starting point of this article is the statement that Chile is pursuing an articulated strategy of what the authors define as “additive regionalism”. Additive regionalism is a strategy that consists in “negotiating bilateral free trade arrangements with all significant partners”. This arises the question of the superiority of this additive regionalism strategy as compared to unilateral trade liberalization. From a theoretical point of view, the debate remains open, as prior studies led to divergent conclusions.

[104] Trade Policy Options for Chile The Importance of Market Access, 2001.

Critics of Chile's additional regionalism strategy stand on the argument that agreements with Southern countries are unlikely to be beneficial, and that it is not worth delaying the benefits of unilateral and multilateral tariff liberalization to pursue these agreements. Only agreements with large partners, such as US, EU or Japan, are beneficial because they imply a sufficiently improved market access[105].

Conversely, the advocate of additional regionalism state that gains to be achieved through trade arrangements with smaller countries (Southern countries) are of significant magnitude.

- Methodology

The authors use the general computable equilibrium (CGE) framework to quantify and compare the network of preferential arrangements that Chile is negotiating, and the unilateral trade policy option.
Simulations are technically implemented with the static Global Trade Analysis Project (GTAP).
The model comprises 11 countries/regions: the Chilean economy as well as the economies of Argentina, Brazil, Mexico, the United States, Canada, Central America, the Rest of South America, the EU, Japan and an aggregate Rest of the World. In the model, the Mercosur region only comprises Argentina and Brazil.

Simulations are run for 24 sectors. This desegregation was undertaken in a manner that ensured that those sectors with significant rates of protection (in the principal trading partners of Chile) are retained as individual sectors.
Simulations are run with two sets of substitution elasticities[106], high and low.

- Results

The welfare impact of trade agreements depends on two elements:

The level of assumed elasticities of substitution. With high elasticities, the trade diversion costs of an agreement typically dominate the trade creation effects. There is less trade diversion when Chile's consumers are less willing to substitute preferred trading partner's products for those of the rest of the world.

The way Chile chooses to replace the lost tariffs revenues. The authors stimulate the impact of three replacement taxes: the existing VAT, a lump-sum tax, a uniform VAT. They show that the two latter solutions (equivalent in their model) are the best alternative in welfare terms. The use of the existing non-uniform VAT induces distortions[107] and is welfare reducing.
Keeping the government revenue constant thus necessitates an augmentation of VAT Simulations show that this augmentation may be very important[108]; for example, a free trade area with Mercosur could require a 45% increase in the VAT rate across sectors.

[105] If Chile forms a free trade area with Mercosur or NAFTA, Chilean exporters will face tariffs inferior to the ones faced by outside exporters to these regions. This difference is used to measure the value of increased access that Chile will obtain from Mercosur and NAFTA markets.

[106] The CGE framework uses in the utility function two elasticities of substitution; between imports from different regions and between imports and domestic production.

[107] When the VAT is increased, resources move into less highly taxed sectors. This reduces any possible gains from the trade policy change.

[108] It is not possible to directly compare the loss of tariff revenue in the case of unilateral trade arrangement. Results are depending on the type of arrangement and of the area concerned.

Simulations give following the results for Chile's preferential trade policy options.
Results first highlight the importance of an improved access to partner markets.

- A free trade area with Mercosur leads to a loss of welfare (-0.19%) with high elasticities and to a welfare gain (+0.19%) with low elasticities[109].

- A customs union with Mercosur, that requires the adoption of a common external tariff[110], ensures Chilean exporters an improved market access to Mercosur countries. However, this preferential access is insufficient to overcome the welfare loss in Chile's markets: - 0.73 % and - 0.17%, respectively with high and low elasticities. The customs union scenario thus appears inferior to the free trade area scenario. The welfare reduction comes from the loss of tariff uniformity that Chile undergoes when joining the customs union[111].

- A free trade area with NAFTA improves Chile's welfare by 1.23 % and 0.43%, respectively with high and low elasticities.

- However, if Chile were to set zero tariffs on NAFTA, with no improved access to NAFTA market, this would generate losses in welfare: - 0.64% and - 0.33%, respectively with high and low elasticities.

Simulations also stress the importance of a uniform common external tariff (CET). Since Chile initially has a low and uniform tariff, a trade agreement may be welfare reducing. The gains of a free trade area with NAFTA are significantly larger when based on the hypothetical non-uniform initial tariff structure. Similarly, the losses from the free trade area with Mercosur are slightly smaller, reflecting a movement toward uniformity.
A CET reduction within a free trade area context has a positive impact on welfare. The impact of the trade agreement with Mercosur is now positive, contrary to the preceding case of free trade area without CET reduction. Chile can profit from the increased market access without excessive trade diversion costs.
A unilateral tariff lowering enhances welfare. However, when elasticities are low, this lowering is limited in scope.

Sectoral impacts are differentiated according to the trade policy option chosen.
- The free trade agreement with Mercosur generates an output growth of transportation equipment (dramatically), machinery and equipment, iron and steel, and milk.

- With the free trade agreement with NAFTA, the sectors that expand more than 10% are iron and steel, transportation equipment, milk, non-grain, crops, and textiles.

[109] Welfare impacts are presented as a percent of GDP of Chile. They represent changes on a recurring, annual basis, so a 1% welfare gain should be interpreted as a 1% increase in real income each year in the future.

[110] The Mercosur common external tariff adopted by Chile and Argentina is supposed to be the same as Brazilian tariff.

[111] Mercosur's tariff structure is diverse compared with Chile's tariff, which is uniform. Since the welfare costs of trade restrictions tend to increase disproportionately with the height of the tariff, Chile is better off with its own uniform tariff than with the common external tariff of the customs union.

> ➢ With unilateral tariff reduction, the expanding sectors are transportation equipment, iron and steel, and to a lesser extent non-ferrous metals and mining.

Authors then assess the Chile additive regionalism strategy. They estimate the combined impact of regional preferential trade agreements. They conclude that gains from additive regionalism are much greater than those from unilateral trade liberalization (between 4 and 76 times larger).

> ➢ A free trade agreement with Mercosur, that implemented separately reduced welfare, has a positive impact (+1.48%) when combined with an agreement with NAFTA. The reason is that competition from NAFTA producers greatly reduces the extent and impact of trade diversion.

➢ Combining free trade agreements with Mercosur, NAFTA and EU generate additional gains to over 5% of the GDP.
➢ Adding an agreement with the Rest of South America will generate an 8.4% additional increase of welfare.
➢ The same trade agreements, but excluding US, still generate an 8.13% welfare increase.
➢ The welfare gains are dramatically reduced if agricultural products and highly protected products are excluded from trade agreements. The exclusion of US products is playing a key role in this welfare reduction.

- The policy options chosen by Chile will have some repercussions on its partners and on other geographic areas.

➢ Since Chile is small, its regional agreements have an insignificant impact on about half of the countries and regions in the model (Japan, the Rest of the World, the United States and the European Union).
➢ The Rest of South America and Central America (RSA), on the other hand, lose from all the agreements from which they are excluded, although the welfare loss is very small (only about 5 hundredths of a percent of their GDP). These regions compete with Chile for the markets in Mercosur and NAFTA and compete with producers from Mercosur and NAFTA for the Chilean market.
Another interesting feature is that the loss is bigger when RSA is included in a free trade area with Chile.
➢ For Mexico, the inclusion of Chile in NAFTA, and the resulting improved access to the US market, results in a very small negative impact. This effect is reduced if Chile combines an agreement with NAFTA and Mercosur.
➢ Brazil and Argentina both lose from Chile joining NAFTA due to erosion of preference margins in both Chile and NAFTA markets. But Argentina and Brazil both gain small amounts from a Mercosur free trade agreement with Chile.

iii. The Michigan Model of World Production and Trade, 1998[112]

Brown, Deardorff and Stern (BDS) give results for the accession of Chile to NAFTA, and the separate bilateral FTAs of Chile with Canada, Mexico and the USA, as well as Chile in the FTAA, and an outcome scenario for the Doha Round. In the latter two cases the results show the effects on the EU as well.

- Methodology

Authors have used their Michigan CGE model to assess various liberalisation scenarios. The model is static and "does not allow for the very long-run adjustments that could occur through capital accumulation, population growth and technological change." They warn that "Our results should thus be interpreted as a lower limit to the economic benefits that may ultimately be realised from a new WTO multilateral round ..".

The Michigan model has been used for 25 years and can handle a number of countries and sectors, the results quoted here being for 20 countries plus the rest of the world, and 18 product sectors, including services.

The 18 sectors include Construction, Trade and Transportation, Other private services and Government services. It is based on the GTAP-4 static model but "it incorporates some aspects of the New Trade Theory, including increasing returns to scale, monopolistic competition, and product heterogeneity." The database reference year is 1995.

Brown and Stern had earlier[113] developed a three sector model - agriculture, manufacturing and services - where an estimate of barriers to FDI by Hoekman (of the World Bank) was used as a proxy for services barriers, and these were again used in the BDS model.

- Results

For Chile the computed results are:

		Impact on GDP	
		%	Million dollars
WTO Doha Round		+1.17%	800
FTAA	all sectors in Chile	+2.48%	2 000
Chile-NAFTA	ditto	+0.92	700
Chile-Canada	ditto	+0.15	124
Chile-Mexico	ditto	+0.17	138
Chile-USA	ditto	+0.60	479

The employment changes in the services sectors in the first two cases are estimated as:

[112] Brown, Drusilla, Alan Deardorff, and Robert Stern, *Computational Analysis of the Accession of Chile to the NAFTA and Western Hemispheric Integration*, Washington DC: U.S. Dept. of Labor (Division of Foreign Economic Research), 1998.

[113] Brown, D., Deardorff, A. and Stern, R. 1996, 'Modelling multilateral trade liberalisation in services', Asia Pacific Economic Review, vol. 2, no. 1, April, pp. 21–34.

	Evolution (number of persons)	
	WTO	**FTAA**
Construction	1,086	- 284
Trade and Transport	-10,226	-7 756
Other private services	5,474	5 466
Government services	-3,752	-2 525

The results of the computations show that "countries as a whole gain from lower costs due to increasing returns to scale, lower monopoly distortions due to greater competition and reduced costs and/or increased utility due to greater product variety. All of these effects make it more likely that countries will gain from liberalisation in ways that are shared across the entire population." "For several of the smaller industrialised and developing countries the percentage increases in welfare are noteworthy." However, in the BS model they conclude "that the smaller countries would experience more employment adjustments than the largest countries."

Due to lack of data, the estimates of "services barriers are based on the calculations of gross operating margins for services firms in the countries / regions in our model. These estimates of services barriers are intended to be indirect approximations of what the actual barriers may be and thus should not be taken literally."

Employment increases "are concentrated in agriculture and the relatively more capital-intensive industries, and there are sectoral employment decreases in the relatively intensive-intensive industries."

Finally they conclude "that while regional and bilateral FTAs may be welfare enhancing for the member countries directly involved, these welfare gains are considerably smaller than those resulting from multilateral trade liberalisation, even comparing the complete elimination of regional and bilateral tariffs to reduction of multilateral tariffs by only one third. Thus, the benefits of FTAs to the developing country partners appear somewhat limited, and, in some cases, could be disruptive because of intersectoral shifts in output and employment, depending on how rapidly the FTAs would be implemented. It is also the case that most of the regional and bilateral FTAs involve elements of trade diversion and are therefore detrimental to some non-member countries."

25.2.2 Other studies using a computable general equilibrium framework

i. CEPII, 2002[114]

Fontagné and others use a MIRAGE CGE model to estimate the impact of the EU-Mercosur Trade Agreement on EU, Argentina, Brazil and Paraguay, and other world regions.

The analysis is carried out on the basis of the CGE model Mirage framework. This model includes 7 regions, NAFTA, EU, Mercosur, developed Asian countries, Other American countries, Other European countries and Rest of the world. Each economy is composed by 19 sectors, ruled either by perfect competition or imperfect competition.

[114] Fontagné L., M-H Bchir, Y. Decreux, M. Mimouni., X. Pichot, 2002, *Les conséquences d'un accord de libre échange entre l'UE et le Mercosur*, Etude financée dans le cadre de la DREE et de la DP.

The impact of the EU-Mercosur trade agreement is simulated on the basis of three different scenarios: limited liberalisation, moderate liberalisation and full liberalisation. These three scenarios share two common principles. First, liberalisation is more rapid on the EU side. Secondly, protection will remain, concerning some industrial products originating into the Community, and concerning some agricultural products originating into Mercosur.

First scenario: limited liberalisation

The impact of the EU-Mercosur trade agreement on the two partners' trade is differentiated.

- For the EU, the trade liberalisation induces an increase in relative exports prices. As a consequence, EU the exports intended for markets other than Mercosur decline.

EU imports are reduced if they originate into countries that are direct competitors to Mercosur on EU markets. This is the case of developing countries. EU imports originating into developed countries slightly increase.

At the sectoral level, liberalisation on agricultural products generates a sharp increase (ranging from 30 to 40%) in corresponding exports to Mercosur. The impact on industrial products is differentiated. Most rapid increases in exports concern Clothing (400%), Vehicles (170%), Electronics (84%), Metal Products and Other Manufactured (70%), Wood and paper (54%).

- For Mercosur countries, the scenario of limited liberalisation will induce a reduction of export prices, then improving the international competitiveness of Mercosur products. As a consequence, Mercosur exports to the seven considered regions increase.

Mercosur imports originating into regions other than EU decline. This is eviction effect is of significant magnitude. The authors estimate that the most concerned geographic areas are Asian countries (Mercosur imports originating into this region decrease by 19%) and NAFTA (15%). They are most exposed to EU competition since their exports to Mercosur are direct substitutes to EU products. Other European countries also undergo a reduction of their exports to Mercosur (-9%).

At the sectoral level, one observes some drastic evolutions. Mercosur exports to EU of Processed Foods and Cattle increase by 20%. Turning to industry, all sectors experience an increase. The most important ones, reaching 65%, occur in two sectors, Textile-clothing and Vehicles. The rise of Mercosur exports to EU of Metal productions and Electronics range by 30 to 40%. In other sectors, the increase is 15% on average.

The impact of the agreement on welfare is once again differentiated.

- EU welfare augments by 0.08% though revenue from tariffs decrease by 1%.
- Conversely, the impact on Mercosur is negative. The area undergoes a decline in welfare. The improved access of Mercosur products to EU markets does not compensate three negative effects generated by the agreement: the loss due to a less efficient system of tariffs, the loss of tariffs revenue (which decreases by one quarter) and the deterioration of the terms of trade.
- The impact of the EU-Mercosur agreement on other regions is negligible, except for developing countries, which are likely to suffer a little from it.

Average liberalisation scenario

The difference with the previous scenario is that liberalisation is more important for agricultural products. Moreover, for Mercosur countries, liberalisation is more rapid than in the preceding case.

As in the preceding case, simulations show that liberalisation will have a differentiated outcome; beneficial for EU and detrimental to Mercosur, though the imbalance is now attenuated.

The disparities first appear in the evolution of bilateral trade.

- In the long run, EU exports to Mercosur have increased much more than Mercosur exports to EU. These trade flows augmented respectively by 48% and 29%. However, Mercosur trade will be relatively more affected than EU trade. For Mercosur, total exports will rise by 8.1% and total imports by 7.1%. Figures for EU are 0.7% and 0.7%.
- EU exports to other geographic areas are declining. This diminishing, ranging between 0.4% and 1.1%, is much smaller than in the first scenario.
- Turning to EU imports, simulations show that they are reduced only when originating into Other American Countries and Rest of the World. The productions of these two areas are the most directly competed by Mercosur exports to EU. The reduction of EU exports to these two geographic areas is slightly more marked than in the first scenario.
- At the sectoral level, evolutions of EU trade are similar to those of the first scenario.
- The exports of Mercosur intended to NAFTA, Asia and Other American Countries increase. Exports to Other European Countries and Rest of the World decrease. Note that these evolutions are much smaller than for the first scenario (ranging between –0.6% and 12%).
- Mercosur imports originating in other regions than EU are diminishing. These evolutions are comparable to the changes obtained in the first scenario. Here again, the eviction effect is important.
- Turning to sectoral trade, the evolutions are in line with those of the first scenario. Note however that increases in exports of agricultural products are more pronounced, while augmentations of exports of industrial commodities are attenuated.

The repercussions of the trade agreement on welfare differ from the first scenario.

- For EU the increase in welfare (+0.12%) is slightly superior to the augmentation, which occurred in the limited liberalisation case.
- For Mercosur, two stages have to be distinguished. In a first stage, the impact on welfare is negative. The impact becomes positive 15 years after the entry into force of the agreement. According to the authors, this delay corresponds to the time needed to Mercosur industry to restructure, to offer products more adapted to EU demand and then to fully exploit the better access to EU markets.
- Simulations show that the impact on other geographic areas is negligible.

Full liberalisation scenario

In this scenario there is a full liberalisation process, in all sectors, for both parties. Simulations show that this scenario would generate a much less uneven outcome.

The evolution of bilateral relations would be of comparable magnitude: EU exports to Mercosur augment by 76%, while Mercosur exports to EU increase by 77%.

The exports of the two parties to other geographic areas are diminishing. This decline ranges from –0.2% to –0.7% for EU and from –3% to –6% for Mercosur. The fall, for the two parties, of the imports originating from other regions illustrates an important eviction effect. Mercosur imports from Asia and NAFTA are reduced respectively by 24% and 19%. EU imports originating

from Other American countries are diminished by 4.6%, while EU imports originating from Developing Countries shrink by 1.6%.

At the sectoral level, bilateral trade of agricultural and processed agricultural is highly stimulated by the trade agreement.

- The evolution of Mercosur exports to EU in these sectors are amounting on average to 4-5 times the evolution of scenario 2. The most significant changes concern Cattle (+500%) and Cereals (+80%).
- Mercosur exports of industrial product intended to EU markets experiment approximately the same evolution as in the scenario of average liberalisation. EU exports to Mercosur of industrial commodities are growing more rapidly than in the preceding scenario in every sector, especially Textile and Chemicals.
- EU exports of services intended to Mercosur market increase (the augmentation is ranging from 1% to 4%), while Mercosur exports of services to EU countries diminish (the reduction is ranging from 4% and 11%).
- One striking result is that, in this scenario, the eviction effect at the sectoral level can be important. For example, the exports of Other American Countries and Rest of the World of Cattle products to EU are diminishing by more than 85%. NAFTA exports of Vehicles to Mercosur are reduced by 60%.

In terms of welfare, both parties are beneficial. In the long run, welfare increases by 0.14% for EU and by 0.45% for Mercosur. For other geographic areas, the welfare loss is grater than for the first two scenarios, because the eviction effect is enhanced.

ii. The Australian Productivity Commission FTAP model

The Australian Productivity Commission (APC) has developed a GTAP-based modelling technique for assessing barriers to trade in services where the services part of economies is disaggregated into five sectors: Construction, Distribution, Telecoms, Financial services and Other services. The model also includes the primary, manufacturing, and ownership of dwellings sectors. Thus only the construction sector is common as a distinct sector to the APC and EU-Chile studies.

In 1999 the APC obtained a standard GTAP model which contained estimates of barriers to trade in agricultural and manufactured goods updated to post-Uruguay Round levels, but it did not contain estimates of barriers to international trade in services. To create FTAP the APC workers adapted it by including estimates of barriers to trade in banking services and telecommunications services, and used a simple average of the two as a proxy for all services. The commercial presence of services suppliers was modelled by incorporating FDI, and it appears that the data used are from nearly a decade ago. This three sector version was used to model 19 economies of which Chile was one and the EU another, the results for which are shown below. The authors warn that the conclusions reached should be heavily qualified because the entire third sector results were based only on estimates of barriers in the banking and telecoms sectors.

More recent work is being done to insert estimates of barriers for maritime and air transport, professional services, distribution and modifications for banking and telecoms. Results for the telecoms sector are available from this FTAP2 model, taking into account the dichotomy between international and domestic call traffic.

APC studies have also been done for Malaysia's banking services, Indonesia's telecoms services, and on FDI in services in the Philippines. They conclude that all economies stand to gain from market access liberalisation: the protected economies through more efficiency of resource allocation, and the liberal economies through the positive terms of trade effect. In general developing countries have more restrictions and thus have more to gain from their removal.

They surmise that their results are probably at the lower bound, because FTAP2 omits any impact on portfolio investment and the effect on incomes. Neither does it account for sectoral variations in barriers; nor the effect of inappropriate regulations on productivity and new product innovation.

They go on to suggest that it is best to reduce all restrictions simultaneously, focusing first on non-discriminatory, rather than discriminatory measures, so as to avoid ending up with domestic firms holding a smaller share of the market.

They hope to improve the FTAP2 model by incorporating treatment of wealth accumulation, commercial presence, international capital mobility, and the cross-border supply of telecoms.

In the GTAP modelling of liberalisation for goods trade a quantitative assessment of the impact relies on data taken from customs and the national accounts, and general equilibrium techniques are used - there is general acceptance of the approach and parameters here. The units, volumes and prices used are generally dependable, and tariff rates by product similarly.

- Note on FTAP Methodology

The FTAP methodology for the approach to the service sector is distinct to take account of the inherent differences of the nature of services and how they are supplied. The domain of enquiry is mainly government measures acting as non-tariff barriers, which are inherently unquantifiable.

Conceptually the effects of liberalisation are due to changes in: allocative efficiency, terms of trade, FDI patterns (stocks, return on capital), and rents (barrier removal). Potential gains are determined by: initial barrier size, initial market size of liberalised sector and the market share of foreign affiliates

The techniques used in FTAP are both conceptually and practically still in their infancy. Furthermore the data available has serious problems. This is due to lack of survey coverage, lack of agreed units, volumes and quality measures, to varying definitions and classifications.

There is a lack of inventories of measures, and lack of clarity on the definition of a restriction, whether a measure is non-discriminatory and how to detect whether it hides discrimination. The studies depend on the collection of comprehensive information on 'restrictions', which is very time consuming to collect, and there is a need for coordination by international bodies that do so. This qualitative information is converted into quantitative measures, which are internationally comparable, and used to judge the effect on price-cost margins, whether due to price-increases, or cost increases or a combination.

No attempt yet has been made in the FTAP model to disaggregate the results by the four GATS modes of supply, though it does take account of all four in aggregate to a large extent.

It is difficult to judge, or benchmark, optimal regulation to compare with the actual level of restrictions, or to settle on criteria for the attributes of best practice. There is also the problem of how to convert qualitative criteria into empirical benchmarks. This is in a context where national values, aims, resources and situations can vary markedly.

There is further the need to distinguish between other effects on prices not related to barriers to trade, such as those resulting from the economic cycle, market structure, price elasticity of demand, the degree of effective competition and service substitutability.

The FTAP approach models both the restrictions on market access, and those on national treatment and ongoing operations. Barriers are treated like a tax on capital (ie establishment), and on output (ie operation), for both foreign affiliates and domestic suppliers. An additional 'tax' on foreign affiliates arises where they do not receive full national treatment.

25.2.3 Other econometric modelling exercise: The World Bank alternative model

In contrast to the conventional GTAP-based econometric modelling approach, a World Bank study affirms that it is possible to construct policy-based, rather than outcome based, measures of openness of service sectors to explain why and how the impact of services liberalisation on output growth differs from that for goods liberalisation. The authors further assert that liberalisation can have important positive effects on long run economic growth.[115] Their technique captures both the policy regime toward inflows of foreign factors of production, and measures that promote domestic competition.

Their conclusions were based on studies of the financial services and telecom sectors, tested in econometric models to demonstrate the positive effect of openness on long-run economic growth.

25.3 Sustainability related studies

Section 25.3 presents major contributions, which depict how trade may affect different dimensions of sustainable development.

25.3.1 Environment

i. Nordström H. and S. Vaughan, 1999[116]

In their contribution, Nordström and Vaughan provide an overview of the complex relationship between trade and environmental considerations. They first review the theoretical links between trade and environment. They then examine how these links can be quantified. They also consider the interactions between trade and environmental policies. Finally they discuss the relationship between trade, economic growth and environment.

[115] 'Measuring Services Trade Liberalization and its Impact on Economic Growth: An Illustration', Aaditya Mattoo, Randeep Rathindran and Arvind Subramanian, Policy Research Working Paper No 2655, August 2001

[116] *Trade and environment*, World Trade Organization (WTO), Special Issue N° 4, Geneva, 1999, 65 p. + annexes

This study is a new stage in the GATT's (which became the WTO in 1994) investigation on the environmental impact of international trade. It officially started with the Group on Environmental Measures and International Trade set up in 1971, but was actually reactivated for preparing the *Earth Summit* held in Rio in 1992. The Group basically concluded then on a positive environmental impact of trade liberalisation[117]. On the other hand, the present study, which offers a rather comprehensive review of the literature on the relationship between international trade and environment (academic literature, as well as studies sponsored by international bodies such as the OECD, the World Bank or the ILO), shows how the WTO is now aware of the controversial aspect this issue. "*We shall argue that economic integration indeed has important environmental repercussions, and not all of them favourable*" wrote the authors in their introduction (p. 10). Legal issues are not pursued in this study, although they are partly addressed in the annexed documents[118], which aimed at moving behind them to the underlying economic and political economy dimensions.

Three key questions are addressed in this study. Firstly, is economic integration through international trade and investment – in other words international economic liberalisation – a threat for the environment? Secondly, does the development -i.e. the liberalisation – of international trade undermine the regulatory efforts of government to control pollution? Thirdly, will economic growth driven by international trade help us to move towards sustainable use of world's environmental resources?

The first question is dealt with in two first sections following the introduction. In Section II, the text starts with a discussion on the underlying sources of environmental degradation that are often seen here as the result of market and policy failures and that in turn may be either exacerbated or mitigated by international trade. Section III investigates how the question could be quantified, by surveying recent findings based on general equilibrium models of trade and environment. The second question is dealt with in Section IV where the authors wonder whether international economic integration undermines environmental policies or not. The third question is addressed in Section V that discusses the relationship between trade, economic growth and environment (potentially pulled up by international trade development) especially around the environmental Kuznet's curve hypothesis.

- Causes of environmental degradation and interaction with international trade.

Section II goes through some of the main environmental items: chemical-intensive agriculture, deforestation, air pollution (global warming and acid rain) and overfishing (nothing is said for instance on water or production of solid waste that are also relevant in this context). For each case, the authors point out the economic incentives that drive environmental degradation and

[117] - In the Agenda for the 21st century adopted in Rio at the 1992 UN conference on Environment and Development, Chapter 2 expresses the views of the GATT's Working Group on environment and Trade. Elsewhere the conclusion of the Group were published in Anderson K. and Blackhurst R. (ed.), *The Greening of World Trade Issues*, Harvester Wheatsheaft, New York, 1992. The Group was initially established for the preparation of the UN conference on Human Environment, held in 1972 in Stockholm.

[118] - The 5 documents annexed to the study contain respectively a note by the WTO 's secretariat on "Trade and environment in the GATT/WTO", the Report of the Chairman of the Group on 'Environmental Measures and International Trade' to the 49th session of the contracting Parties, the conclusions and recommendations of the 1996 Report of the Committee on 'Trade and Environment', a list of documents prepared for the above-mentioned committee between 1995 and mid-1999, and the WTO's decision of 14 April 1994 on Trade and Environment.

briefly discuss the efficiency of policy options before concluding on the impact of international trade regimes (trade barriers *versus* free trade).

From the example of the intensive use (if not overuse) of chemical inputs in (exporting) agriculture, Nordström and Vaughan essentially stress that, if trade measures (such as tariffs or subsidies) could help to discourage polluting activities, it is only a second-best approach. Well-targeted environmental policies (standards, tax on polluting inputs or consumption) should do the job better and cheaper (first-best).

For Nordström and Vaughan, the causes of deforestation lie partly in the pressure to convert forest into farmland, partly in the absence of market for the services provided by forest (e.g. carbon storage, biodiversity). They nevertheless recognise that policies encouraging forest clearing, such as subsidies or tax cuts, could aggravate the problem. However, for them, trade barriers, by depressing forest's value compared to alternative land usage, could in fact be counterproductive.

As regards emissions of pollutants to air, the text distinguishes between global (greenhouse effect) and transboundary (acid rain) pollution. Since both of these kinds of pollution are mostly rooted in the burning of fossil fuel, international trade is a direct contributing factor through the emissions stemming from transport means when goods are shipped between different countries (and also within national territories as a consequence of international trade). Consequently, if the authors agree that trade barriers could possibly use as a second-best option to reduce international transport emissions, they think that is more effective to not discriminate between international and domestic trade – i.e. between emissions from international and domestic shipping. Anyway, a large amount of air emissions also stems from stationary sources such as power plants and other plants in energy-intensive industries. It is therefore possible to argue in favour of trade measures (tax on carbon or on the energy content of imports) in order to avoid that international trade agreement would be defeated by relocation of polluting factories to non-signatory countries, but it could cause conflict with the latter as regards WTO rules. In the case of acid rain specifically, such an option is realistic only for largest countries or, at least, countries representing a significantly large enough share in their neighbours' exports.

In the subsection on overfishing, Nordström and Vaughan start by indicating how unrestricted or open access to fishing areas (referring later in the text to the well-known, but controversial, "tragedy of the commons"), and not free trade as such, is the first policy failure at the core of the problem. Nevertheless they acknowledge that, still in this case, international trade could exacerbate overfishing by of course increasing the pressure exerted by the demand. However, the authors also denounce the prevalence in that matter of governments' subsidies reducing fishing cost.

In conclusion, the authors deny that environmental degradations are rooted in international trade as such, but rather in market, as well as policy, failures. They acknowledge that international trade can sometimes exacerbate the effect of poor environmental policies. However, for them, trying to tackle environmental problem by targeting indirect linkage, such international trade, may divert the attention from the true cause of environmental problems.

- General equilibrium linkages between international trade and the environment.

Section III is the most relevant part of the study as far the environmental impact assessment of international trade liberalisation (or, broadly speaking, international economic integration) is concerned. This section concentrates on the recent literature since the revival of the trade and environment debate prompted in the early 1990's by the tuna-dolphin dispute between Mexico and the USA and, to a wider extent, by the controversies surrounding the North American Free Trade Agreement (NAFTA). After a theoretical review, the authors turn to the empirical side, before eventually reviewing some general equilibrium models applied in this context.

In a theoretical overview, Nordström and Vaughan they start with what has become, since Grossman and Krueger's 1991 study[119] on NAFTA's environmental impact, a customary decomposition between *composition*, *scale* and *technique* environmental effects of international trade. Considering that technologies remain the same (i.e. for given pollution coefficients per unit of output), the *scale effect* says that the more (international) trade is significant higher the (negative) environmental impact should be. However, provided that international trade specialisation is based on factor endowments (especially labour and capital abundance), the *composition effect* should lead 'dirtiest industries' (usual capital intensive) to be settled in (developed) countries showing the more restrictive environmental regulations and the global environmental impact should therefore be positive. Finally, thanks to the *technique effect* 'cleaner technologies' should easily be transferred to developing countries in a free trade regime. In the end, what matters for the environment is of course the net result of the three effects.

In their review the Nordström and Vaughan take into consideration the distributional aspect between North and South (i.e. developed and developing countries), which is indeed an important dimension of the issue[120]. On the first hand, they rather conclude that international trade liberalisation would mitigate local environmental problems in developed countries and magnify them in developing countries, believing in the contraction of polluting industries in the North (positive composition effect) whereas they should expand in the South. The scale effect has a negative environmental impact in any case, and the technique effect would not neutralise the negative composition effect in the south[121]. On the other hand, trade liberalisation should improve global pollution if classical factors of comparative advantages prevail over the difference between environmental standards (they are supposed to be stricter in the North than in the South). Otherwise, it should worsen global pollution problems.

[119] - Grossman G.M., Krueger A.B., *Environmental Impact of a North American Free Trade Agreement*, National Bureau of Economic Research Working Paper N°3914, Cambridge (USA),November 1991; and published later in P.M. Garber (ed), *The U.S.-Mexico Free Trade Agreement*, The MIT Press, Cambridge (USA), 1993, p. 13-56.

[120] - However, Nordström and Vaughan do note explicitly talk about the emerging concepts of *ecologically unequal exchange* and *environmental load trade displacement*. It is worth mentioning here that these concepts were applied in respectively for the relation between Europe and Chile and on the Mexican situation within the NAFTA. See Van Hauwermeiren S., de Wel B, *Questioning Europe's unequal ecological exchange. The Chilean case* (13 p.) and Alvarez-Bejar A., *The ecological cost of the patterns of productive specialization under NAFTA: Economic integration of the northwest Mexico with southwest-US* (28 p.) that were both presented at the meeting "International trade, environment and sustainable development", IEPE / Université Pierre Mendes-France, Grenoble (France), 5 and 6 September 1996.

[121] - However, Nordström and Vaughan note that models that take into consideration classical factors of comparative advantages (capital abundance in the North and labour abundance in the South) generate opposite prediction about the *composition effect* – i.e. polluting (capital-intensive) industries' strengthening in the North whereas labour industries remain dominant in the South. In the end, the final result still depends on the balance between the three effects.

In their empirical overview, Nordström and Vaughan observe that the tendency over the last decade (i.e. the 1990's) suggests that the above-mentioned classical factors of comparative advantages seem actually to predominate over differential environmental standards between developed and developing countries. Therefore, average pollution may decrease with trade liberalisation. As stressed earlier in the study, since general equilibrium models of trade and environment are still in the infancy, the authors invite the readers to be cautious with such a conclusion, since it depends on whether local or global pollution is dealt about and it also shows a strong dependence on the pollutants taken into consideration. However, a recent study covering 44 countries over the period 171 to 1996 is quoted to confirm that pollution can fall when international trade grows. This study was about SO_2 emissions and the technique effects plausibly dominated the scale effect, but it is very likely that would not be the case for CO_2 emissions.

Nordström and Vaughan end section III by reviewing some applications of computable general equilibrium models that aim at simulating the environmental impact of international trade especially capturing the above-mentioned composition, scale and technique effects. They start by pointing out what they consider as the notable efforts of Global Trade Analysis Project[122] for developing models of the world economy in which countries are linked through trade flows, although the lack of environmental data has so far prevented these models to be used for environmental assessment. However, the authors also stress that industry-specific pollution data on a country-by-country basis would make it possible estimating the composition, scale and technique environmental effects of trade liberalisation[123]. After, the authors report on some study that actually attempted to estimate such effects. They firstly quote a 1998 paper dealing with the impact of the Uruguay Round on air pollution, but in which pollution data of the USA were substituted to lacking data[124]. Therefore, Nordström and Vaughan present the use of polluting intermediate inputs (for which data usually show a better availability) as a promising approach in order to compensate the lack of environmental data, especially in developing countries. This method was directly applied by its promoters on the trade policy reforms in Mexico (and recently in Chile) using a computable general equilibrium of the Mexican economy[125].

In summary, for the authors, it seems that numerical models have confirmed the theoretical findings according to which trade liberalisation can harm local environment in countries with comparative advantage in polluting industries and improve the local environment elsewhere. At the same time, they also indicate that income gains of trade could pay (the implementation depends on

[122] - The GTAP is a consortium of national and international agencies based at Purdue University (website: www.agecon.purdue.edu/gtap). The models developed by the GTAP were used by the WTO in evaluating the economic effect of the Uruguay Round.

[123] - It is worth mentioning, that, in Eurostat environmental accounting project, the NAMEA (National Accounting Matrix including Environmental Accounts) framework aims at pushing for the compilation of industry-specific pollution data on a country-by-country basis in the EU, as well as EFTA countries. The most far advanced area concern the emissions of atmospheric pollutants. In the ESA, the EPA has started compiling NAMEA-type air emission account, but only for manufacturing industries (i.e. especially excluding agriculture and mining, as well as services industries that include transport services).

[124] - Cole M.A., Rayner A.J., Bates J.M., "Trade Liberalisation and the Environment: The case of the Uruguay Round", *World Economy*, Vol. 21, N° 3, May 1998, pp. 337-347.

[125] - The first study is largely based on the model named TEQUILA (Trade and Environment eQUILibrium Analysis). The corresponding studies are respectively: Beghin J., Roland-host D., van der Mensbrugghe, *Coordinated approaches to Mexican Trade and Environmental Policy*, Mimeograph, OECD Development Center (Paris), December 1994; Beghin J., Bowland B., Dessus S., Roland-host D., van der Mensbrugghe, *Trade, Environment, and Public Health in Chile: Evidence from an Economy-wide Model*, Manuscript, OECD, April 1998.

economic agents' willingness to do it, which has something to do with the environmental Kuznets Curve dealt with in section V) for additional cost in order to undo negative environmental repercussions. Although Nordström and Vaughan deny any inherent conflict between trade and environment, they acknowledge that environmental policy inadequacy may in turn be related the world economy globalisation that makes capital more mobile and therefore more difficult to regulate for individual countries.

- Does economic integration undermine environmental policies?

Another way to approach the "environmental impact" of trade and investment liberalisation is to investigate whether economic integration weakens environmental regulation. According to what is known as Porter hypothesis, (environmental) regulatory pressure, like competitive pressure, encourages industrial innovation (as we could see with the development of substitute products for ozone layer-depleting CFCs). However, Nordström and Vaughan could not avoid raising the question, as they do in Section IV, of what is now customary named "ecological dumping". In other words, do stricter environmental regulation (in developed countries) causes relocation of the most polluting industries (in developing countries)? Broadly speaking, do countries inter in a "competition in laxity", as regards environmental standards, for the sake of competitiveness?

Complaining on the lack of data, Nordström and Vaughan start with a review of the USA's experience, which they say is well documented, and where environmental standard can differ from State to State. Such review leads to think that environmental standard compliance related costs have an impact on the location of polluting plants. However, if environment matters in the location of industries, unspoiled environment (i.e. resulting from strict environmental standard) may also be a relevant factor for a region (a State) to be attractive for inwards investment flow. At international level, the issue seems to be a bit more controversial and for the authors the studies available do not actually show that environmental regulation is of primary importance for location decision. Nordström and Vaughan nevertheless felt they could not avoid dealing with environmentalists' concerns about risk of "competition for laxity" or "race-to-the-bottom"[126] occurring when countries (governments) restraining themselves in the matter of environmental regulation in order to keep being competitive or attractive for foreign direct investment or. One factor that may ease the occurrence of such a race is when economic or industrial lobby gets the hand over green lobby (it seems to be the case, for instance, in the USA, as far as the Kyoto Protocol on the mitigation greenhouse gas emissions is concerned). It is worth mentioning that a "race-to-the-top" may prevail in the opposite situation when governments implement strict environmental standard under the pressure of green activists and local populations. This latter kind of race has something to do with the "Not In My BackYard" (NIMBY) phenomenon characterising the fight of local populations (usually supported by green NGOs) against the settlement of infrastructures such as motorways, railways or a waste dumping sites in their local area.

Although environmental initiatives are defeated time to time because of competitiveness concerns, data do seem to support the hypothesis that investment are fleeing developed countries for developing countries because of their more lax environmental standards. Nevertheless, the "*perceived*" lose of regulatory autonomy in the former because of the removal of trade and

[126] - The "race-to-the-bottom" concept finds its origins in the literature on local public finance. It was initially related to households' mobility and the balance between local taxes and public services supply.

investment barriers, stresses the need for more co-operative solutions to common environmental problems. However, in the context of international economic integration enhancing competition for foreign direct investment, it is rather difficult to achieve co-operative agreement. The authors call then for environmental economics' support that, they say, do not suggest that environmental should necessarily be harmonised across countries, and they even conclude that "*international variations in environmental standards may be desirable in order to reflect differences in income and ability to pay for environmental quality*" (p. 44). If differences have to be made between developed and developing countries, we do not think it should be about standards, but it may be relevant to differ their respective commitments as regards their different historical responsibilities in the occurrence of the environmental problem considered (at first sight, it seems quite relevant for global environmental problems; e.g. in the Kyoto Protocol on global warming such differences prevail between countries that have to mitigate their emissions right now and the others, as well as within the first group of countries that committed for different percentages).

- The relationship between international trade, economic growth and the environment

The relationship between international trade, economic growth and the environment is approached in section V through what has become a customary concept in that matter, namely the Environmental Kuznets Curve (EKC)[127]. It says that pollution should increase at early stage of development, but turn downward after a certain income level has been reached (inverted U-shaped EKC). The three first sub-sections give an overview of theoretical and empirical findings related to the EKC, before actually turning to its application to the environmental impact of international trade.

The concept of EKC has something to do with the analysis of *coupling/decoupling* between pollution and output or any other economic aggregates. It raises the question why income-dependant path (coupling) of pollution are eventually turned down (decoupling). Nordström and Vaughan review three possible explanations. The first lies in the fact that the demand for environmental quality may rise with income level. The second explanation could be found in the technology for pollution abatement and it evolution, since unit abatement cost should decrease with scale of production (the authors also point out the possible wave-like EKC caused by successive generations of pollution abatement technologies). Thirdly, Nordström and Vaughan stress that what appears as an income-pollution relationship may actually (or sometimes) be the result of structural changes.

In the context of international trade, all countries cannot specialise in "clean industries" and world-wide inverted U-shape EKC are very unlikely (it seems that global pollution does not fit to the hypothesised inverted U-shaped EKC). The authors end their theoretical review by raising the question of whether the EKC is an automatic process or policy dependent. At the international level, the point is to know whether the downward path of the EKC automatically transmitted to developing countries with international trade-driven growth or foreign direct investment liberalisation (i.e. transferred technology).

[127] - This hypothesis was named so after a 1995 of Simon Kuznets in which the author showed an inverted U-shaped relationship between the level and inequality of incomes. Such a hypothesis has been reused on the relationship between pollution or environmental degradation and income levels.

Nordström and Vaughan clearly conclude negatively, stressing that political institutions really matter.

The numerous empirical studies in this area show how the EKC is still a controversial issue. However, the Report draws some worthless lessons. Firstly, the level of the turning point really depends on the pollutant or the environmental indicator considered (so far, EKC literature has rather been focusing on air emissions' turning points). Secondly, for several observers the inverted U-shaped curve more accurately resembles an N-shape for many environmental indicators – i.e. after a downward trends, the curve resume rising. However, as mentioned earlier with the technological dimension, the curve may be downward again, showing a M-shape, and even successively going up and down with pollution abatement or clean technology generations for ending with a wave-like shape. Finally, local pollution is more likely to accord with the EKC hypothesis than global pollution (notably CO_2 emissions).

Before reviewing the relevant literature, Nordström and Vaughan point out two difficulties faced by empirical investigation in this area. Firstly, the comparative advantages are not static, but they can evolve over the time – i.e. capital and labour endowment are not given once for all. Therefore, polluting composition of national output also changes over the time even independently of trade barriers. Secondly, it is rather difficult find countries (at least two) starting with the same comparative advantages, but embarking respectively on inward and outward-oriented economic development. In short, the review suggests that EKC's shape is influenced by the composition effect of international trade (see above about Section III). Since structural changes in the global economy have shifted some polluting industries from developed countries to developing countries (especially rapidly developing countries), the composition effect has helped the former to reach ECK's turning point, while the up-ward segment of the curve has become steeper, pulling up the turning point, for the latter.

When concluding on this point, Nordström and Vaughan have to recognise that the literature does not give any compelling evidence that pollution trends should turn downward with increasing income. If income growth seems to be a necessary condition, it is definitely not a sufficient condition for improving environmental conditions, or at least reducing environmental degradation already going on. Therefore, they believe that EKC is not so dependent on income level as on the institutional context, and not only on relevant environmental policies, but more broadly on democratic institutions (which is consistent with a wide definition of sustainability).

Nordström and Vaughan end their study with three concluding remarks. They firstly call for the international co-operation enhancement on environmental issues, since economic borders removal increase the mobility of industries. Secondly, the think that the WTO could serve as a model for this co-operation among nations (governments). The last remark is for the WTO itself, which is invited to contribute (even within its current mandate) by pushing for the removal of trade barriers on environmentally-friendly production technologies and the reduction of subsidies that harm the environment.

ii. Von Moltke K., 2002[128]

The contribution of Von Moltke aims at placing trade and environmental sustainability within the framework of the EU – Mercosur / Chile negotiations

[128] Von Moltke K., 2002, *European Union/Mercosur Negotiations: The Environment and Sustainable Development Dimension*, WWF European Programme Office.

and at putting these negotiations within the framework of the wider global trade and environmental sustainability debate. Its policy focus thus provides a very useful and readable context for the Sustainability Impact Analysis, rather than being aimed at providing direct inputs to this analysis. Although this is not the main objective of this paper, there are some directly practical points that require noting for the SIA.

The paper notes (p4) that the negotiating agenda includes items that are environmentally significant: 'co-operation on technical regulations and conformity assessment (that is implementation of technical regulations), energy co-operation, transport, co-operation on the agricultural and rural sectors, fisheries and consumer protection.' … 'Investment is the only tool that can reliably shift currently unsustainable economies towards more sustainable practices'. (p5) 'Market access for certain agricultural products forms a priority in the EU/Mercosur process. That aspiration should be supported from the perspective of environmental and sustainable development if measures are adopted that promise to address the environmental consequences of commodity production during a period when production is expanding.' (p6) ' The central challenge is to expand agriculture where its impacts can be managed – and then to manage them successfully. In EU/ Mercosur trade, the most environmentally sensitive crops at the present time are soy, corn and beef. … Some of [the] impacts are directly related to production practices and levels of production. The attendant costs must be internalised into the product chain.'

(p13) 'Agricultural trade represents perhaps the most challenging dimension of the EU/Mercosur process. This is an area where major environmental concerns meet the pressures for market access from Mercosur and the resistance to change rooted in the Common Agricultural Policy.'

The report forcefully makes the point that the SIA process has been added on to the pre-existing EU/Mercosur negotiations and has not been an integral part of these negotiations from the beginning.

(p17) 'Independent, effective institutions for the development of technical regulations and to undertake conformity assessment are a matter of some significance for any country that wishes to participate in the lucrative segment of international trade that is defined by such standards. The need to meet certain standards can create obstacles to market access for those unable to do so… Argentina is the only non-OECD country to have an organic certification process that is recognized by the European Union.' (p18) 'Similar arrangements need to be made for sustainably produced timber or fisheries products.'

(p18) 'Environmental standards are widely perceived as a potential obstacle to market access, even when the need for them is recognized. … 'The environmental dimension should represent a central issue in energy co-operation.' (p19) 'The transport sector contributes heavily to the emission of greenhouse gasses and to local air pollution. Moreover the availability of local transport is frequently a determining factor in urbanization, contributing in turn to patterns of land use.'

'Co-operation in the agricultural and rural sector should involve the promotion of sustainable development in the rural environment. This is probably the most important environmental issue in the Mercosur region because of changes in agriculture that are occurring at least in part in response to changes in trade and their impact on forests, habitat, biodiversity and other parts of the natural environment.'

'Fisheries have become an area of concern in the EU/Mercosur relationship owing to growing EU investment in fishing capacity in Mercosur countries. The need to control subsidies that create incentives to over fish limited fish stocks is by now widely recognized.

(p20) 'The overriding issue in the trade negotiations is market access, in particular for commodities. … Exporters of commodities fear the imposition of environmental requirements pertaining to their process and production methods as little more than an additional barrier to market access, in particular if market conditions do not provide additional resources to cover additional expenses that may be associated with meeting such requirements. … The risk of protectionist capture of environmental issues is a matter that must also be addressed directly. Environmental criteria are frequently identified by representatives of developing countries as a general threat to market access.'

(p21) 'There are a number of crops that can, and even should be grown in the countries of Mercosur—provided that essential environmental concerns have been addressed. These include soy, corn and grass fed beef. These crops are sensitive in the trade context, not least because full liberalization of markets would be expected to yield dramatic shifts in the patterns of production… There are no reasons rooted in environment or sustainable development to oppose such a shift but it is necessary to recognize that it is also sensitive from an environmental perspective. Expansion of the agricultural frontier entails large environmental consequences, some of which may prove to be irreversible. These typically include deforestation, destruction of critical habitat and loss of biodiversity. In many instances it is possible to protect these essential environmental values, but this requires resources and political will, and it has to happen when expansion occurs and must be supported subsequently with a continuing stream of activities.'

(p22) 'Beef imports face significant trade restrictions. … It is … highly likely that beef is among [the highly sensitive for EU /Mercosur] products both because of its central role in the Common Agricultural Policy and because it represents a product with fairly obvious potential for expansion.'

'From an environmental perspective the major concerns with soy and beef expansion are largely comparable: they concern … critical ecosystems, forest ecosystems in particular, the provision of wildlife habitat and the protection of biodiversity. In practice this also entails preservation of critical forest ecosystems. These are all factors that are not themselves factors of production. Hence measures to protect them can in principle be taken without distorting markets.'

'Investment is the only tool that can reliably shift currently unsustainable economies towards more sustainable practices. At the same time, international investment agreements have proven themselves to be potential obstacles to the ability of governments to adopt measures that are needed to promote sustainability. There is thus far no indication what direction EU/Mercosur investment negotiations are likely to take.'

(p29) 'The most important challenge facing the European Union and Mercosur countries is to develop open international markets that promote conservation in the rural environment. … The central challenge is to expand agriculture where its impacts can be managed—and then to manage them successfully. The most sensitive crops at the present time are soy, corn and beef, with soy and corn often grown in rotation. The expansion of these crops threatens to

accelerate deforestation, eliminate critical wildlife habitat and reduce biodiversity in ways that are irreversible. Some of these impacts are directly related to production practices and levels. Others are largely independent of the level and form of production, reflecting long term land use choices.'

(p31) 'Agriculture … involves environmental inputs that are partially priced. … It appears unlikely … that all relevant environmental factors will ever be priced by functioning markets. … Conservation of essential public goods in the rural environment entails costs, many of which are only incidentally linked to the productive functions. Sustainable commodities trade must ensure that the necessary resources are available to address these fundamental needs in the rural environment.'

'Product chains do not provide the necessary resources to producers to address the needs of rural conservation. … The very efficiency of commodity markets in eliminating rents has … eliminated the scope for addressing … environmental factors that do not have prices determined by markets… Efficient functioning of commodity markets … cannot reflect all relevant costs. Highly efficient markets eliminate the opportunities [for resources to be found to address costs not reflected in market prices] and consequently require some form of government action to rectify the inadequacies of markets in the face of the environmental impacts of agriculture.'

(p32) 'The European response … has been a structure of payments that are made available to producers through the CAP. These rural environment measures represent a modest portion of the CAP but have had a dramatic impact on the quality of the rural environment. This reflects the fact that the costs of conservation, while real, are modest relative to other costs in agricultural production. The lessons learned within the European framework apply equally to international markets. … The fundamental principle must be that the consumer jurisdiction is responsible for generating the necessary resources... With respect to commodity imports into Europe this implies a system of payments linked to volumes and sources of commodities [which] must not function as taxes or duties on the imported commodities.'

25.3.2 Gender disparities: GEM/WIDE/CISCA, 2001[129]

This contribution examines the relationship between trade and gender inequalities. It also discusses how gender inequalities may be affected by EU-Mercosur trade agreement.

Implicit in this book is the idea that pre-existing cultural, institutional and legal conditions that are not favourable to women may interact with the new employment and social structure engendered by a trade agreement. A new trade agreement clearly cannot be blamed for pre-existing barriers to women in education[130], training, access to borrowing for business and in family structure and the division of unpaid labour. However, unless women who face these barriers are enabled to take advantage of many of the new employment opportunities created by a trade agreement, they will not be able to do so. Since some former employment opportunities will disappear or be downgraded, there is a real possibility that some women will be made worse off subsequent to a trade agreement. The problem is explicitly recognised (p56) as pre-existing gender inequality; the issue is perceived as not having

[129] International trade and gender inequality – A gender analysis of the trade agreements between the European Union and Latin America: Mexico and Mercosur.

[130] However, the document also claims (p25) that women in the Mercosur labour market now have higher average educational attainments than men.

entered into the trade discussions. Hence the trade agreement is seen as both an opportunity to redress existing gender inequalities and a threat that these inequalities will be perpetuated into the new more market-oriented economy, especially concerning employment opportunities and pay.

The specific trade-related issues mentioned relating to the EU-Mercosur agreement as a whole cover training; gender issues in the agricultural sector; women entrepreneurs, especially in small and medium enterprises; and assistance for social organisations, such as women union members. The report considers that there will be a loss of economic opportunities if the trade agreement is not accompanied by increased female access to business inputs, to international trade and to business associations.

The document examines the issues of urbanisation, woman-headed households and poverty but this is not linked directly to trade agreements for reasons given below. The replacement of the family support network by a social network (of greater or lesser effectiveness) is noted. The report notes (p55) that women seeking urban employment for the first time have higher unemployment than male counterparts and that domestic workers constitute one of the most precarious sectors. The concept of 'precariousness' of especially female employment is a recurring theme.

The report considers that the lack of statistics disaggregated by gender, e.g. on salary differentials and on unpaid agro-industry labourers, constitutes a barrier to the analysis of gender impacts of trade agreements or other social and economic changes. This is perhaps why some of the accounts of women's social and economic situations are not fully linked to trade agreements.

The document notes the exclusion of the agricultural sector from previous EU moves towards liberalised trade. Elsewhere there is a discussion of the relation of food production and food security. As far as can be understood from the report, the problem is related to declining areas of agricultural land that are dedicated to producing food for the local market, leading to higher local food prices. It is also possible that intermittent subsidised food imports can be disrupting domestic agricultural production. The possible linkage of major exchange rate changes and grain speculation is not raised. Unfortunately, the document does not provide clear observations or discussions of these important issues. It notes that the 'Movement of landless rural workers' (MST – Movimento de trabajadores rurale sin tierra) want the exclusion of subsistence and family agriculture from GATT / WTO regulation.

The report includes a number of case studies. In the Tucuman, Northern Argentina, citrus industry, male labour has replaced family labour with increased market oriented agriculture. There is heavy seasonal unemployment, onerous working conditions and worker victimisation, although the situation seemed to be recently improving somewhat. The problem is seen [131] as an absence of the application of labour legislation. The case study of the dairy industry in Uruguay and Brazil also shows that the reorganisation of the industry with the elimination of small businesses led to deepening of existing sex-segregation of workers.

In criticising the impacts on women of a trade agreement, the report accepts that a trade agreement may lead to an increase in income (p13). It asks, 'How does it help women to earn more, in quantitative terms, if there is no qualitative improvement in their welfare, given that most of their income is spent on self-sustenance, on medical care, on her children's education, or on

[131] Trade policy and gender inequality –recommendations, WIDE.

other people under their care?' While this is posed as a rhetorical question, it permits a direct answer. The observation is correct: for many women, increased income will not be accompanied by a widening of the goods and services consumed. The answer is, for a woman in this position, is that she and her dependants will eat more and perhaps better meals, even when she is sick; and she will not have to choose which children continue in school. In other words, at low-income levels a qualitative improvement in living conditions is not necessarily translated into a widening of consumption. 'Disposable income' only comes with further increases in income.

The document throws up a problem of terminology. The EU-Chile and EU-Mercosur potential agreements envisage 'Free Trade Areas'. 'Export Processing Zones', which were designed to attract activities such as the *maquiladora* industry, are a different and alternative structure. However, in some of the literature, both are referred to as 'Free Trade Zones'. This confusing terminology should not be used. 'Export Processing Zones' do not form part of the EU proposal. Indeed, the introduction of a 'Free Trade Area' would make their development less likely.

Annex 1: Terms of reference

Task specifications

This annex specifies the tasks, activities and reporting which will be carried out during this specific agreement.

The precise management of each specific project, work orientations, and the allocation of agreed expert time between the various tasks will be set out in the interim report to be agreed by the Commission (see deliverables below and Annex 5 of the Framework contract).

Requirements and timetables defined by the Commission must be strictly respected by the contractor.

A. Overview, objectives, content of a SIA:

The precise aim of this specific agreement is to conduct a sustainable impact assessment of the EU-Chile -trade negotiations

For information related to the objectives and content of the SIA methodological framework, see the terms of reference of the call for tender of the framework contract.

B. Main tasks and services of this specific agreement:

B.1. Global preliminary SIA

An overview of the potential impacts on sustainability (in the EU and Chile) of the proposed policy measures, based on an assessment of developments in the above trade negotiations in the proposed association agreement between the European Community and Chile (on which information will be provided by Commission negotiators)

1) to refine and adapt for the purpose of the contract the methodology which has been outlined in Phase One and Two of the SIA of a proposed round of WTO negotiations and in a recent methodological study. As far as possible other academically reputable and relevant studies must be integrated into the methodology. This work must include an examination of the comments received from Member States, the European Parliament and Civil Society - (cf. 1.a). It will also include the adaptation of the approach to the requirements of the region in question (EU- Chile), including the definition of additional indicators to measure sustainability and a possible expansion of the scale on which impacts are measured;

2) to fine tune the methodology and the approach to the specificity and timing of the negotiation process

3) to propose and design precisely two scenarios for the assessment process:

i.) a baseline scenario, without agreement
ii.) a scenario with trade agreement;

4) to quantitatively assess the economic impact of EU- Chile trade agreement. Possible examples include the use of :

- a “gravity model”;
- a computable general equilibrium (CGE) model;
- a number of specific sectoral or transversal issues studies, in particular in the field of natural resources (fish, mines, forests);
- a combination of these different technical approaches.

5) In addition to this quantitative economic analysis, to analyse the potential impact on social, social development and the environment of the proposed

measures. For that purpose, the consultant will develop the understanding of the **causal chains** which identify the significant cause-effect link between a proposed change in trade policy and its social, environmental and economic impacts.

This analysis should as far as possible combine qualitative and quantitative approaches.

This analysis should cover both market access and – where applicable - rules-related aspects, highlighting the potential positive and negative effects on sustainability as well as the possible flanking measures to enhance the positive and mitigate the negative effects. The main output will comprise an assessment of those areas where the Contractor considers that more detailed assessments should be carried out. (The main purpose of the work done under (1.a) is to inform that carried out under the next steps of the SIA study).

B.2. In depth assessments of specific sectors

In addition to several sectors which have been identified by the Commission in discussion with the Contractors (fishery, mining sector, forest), sectors identified by the work done under B.1 and by external consultation, will be analysed by the consultant after prioritisation. The sector studies will assess the impact of the agreement on sustainability (economic, social, environment) and in particular on growth, natural resource stock, pollution, equity, gender and natives people issues (social).

This work will include:

- quantitative and qualitative assessments of the impact of the outcomes on the sector concerned. This work should be undertaken on the basis of case studies and economic, social and environmental (including environmental impact assessment(s)) analysis. The results work undertaken in the past the several organisms (WWF, UNEP) should be fully integrated in the assessment process.
- suggestions on what flanking measures might be introduced to best maximise the positive impact of further liberalisation / changes in rule-making and/or minimise negative impacts. This should include an assessment of the various options for mitigating and enhancing measures, including those which could be introduced in other international fora, or in other areas of the ongoing negotiation processes. One purpose of this exercise is essentially to help Commission experts to identify an optimum policy mix with a view to a sustainable implementation of the agreement.

B.3 .Final synthesis

The contractor will provide a final synthesis of the full SIA covering the agreement reached before their adoption in the Council and discussion in the Parliament and with civil society.

B.4. Working meetings

Attend meetings in Brussels with Commission officials as scheduled in the chapter C below.

This will entail, as a minimum, one meeting at the start of the first specific agreement and thereafter three meetings for the presentation of the interim, midterm report and final report.

B.5. Public meetings:

The contractor must participate in public meetings organised by the Commission (involving representatives of Member States, the European Parliament and Civil Society). It must present and explain work completed

and provide the opportunity for interested stakeholders to provide direct input. Provisional meeting schedules are proposed below in the chapter C.

B.6 Electronic documentation

The contractor must create and maintain a web-site dedicated to the above Chile SIA project with a link to the DG Trade web-site. All reports, outputs presented to the Commission and publication / documentation sources will be published by the contractor on this web-site.

The web-site should incorporate a feedback function allowing all interested parties to provide input.

Number of visiting hits and E-mail inputs must be recorded and mentioned in the final reports.

C. Deliverables:

C.1 Content of the reports:

The two first reports (interim and midterm) should aim to describe 1) the state of play of the study and 2) the way ahead and to propose some further developments to be discussed with the Commission

The Commission draw the attention of the consultant to a necessity of transparency in reports which must include all the references, analytical paths needed to understand fully the outcomes and results of the study.

Interim report:

This interim report will provide the Commission with:

- An overview of the consultant's proposed approach to the study, including a presentation of the conceptual framework of the sustainability assessment analysis
- A description of preliminary methodological developments or changes from past studies
- A review of literature, list of tools and references to be uses, list of contact in Chile
- A preliminary screening exercise for the key sustainability issues/impacts associated with the trade agreement
- A preliminary discussion on the selection of sector specific indicators relevant for this study.
- Outlines of the contents for both the mid-term and final reports.

Midterm report:

The midterm report summarise the work that has been undertaken on the project and its principal outcomes between April and May.

In particular, it will describe

- Implementation of the methodology: a summary of the process by which the methodology has been implemented in the case of EU-Chile negotiations
- Information on communication activities :
    - Creation of the web site and links to other web sites. Number of hits.
    - Consultations and dialogue with external experts ad civil society: summary of comments and suggestions received (via E-mail, web

site comment function, ordinary mail, meetings etc.) and the uses made of these.
- Development of network of SIA experts: contacts undertaken, information supplied and comments received.

- State of play of study underway, outcomes regarding the screening phase, design of sector studies
- The way ahead to complete the study

Final report:

The final report will entail the following elements

- The methodology used for the SIA
- The outcomes and results of the assessment
- Proposals of flanking measures
- Communication actions, networking
- Conclusions
- References and key sources

C.2 Timing:

Deliverables for this preliminary, will be produced in accordance with the following timetable, and with the Annex 5 of the framework contract

	Interim report	**Midterm Report**	**Final report**
SIA Chile	19.04.2002	15 May	End of July 2002
Meeting with Commission	25.04.2002	Week 20 in May	End of July 2002
Meeting with civil society		May	End of July 2002

Annex 2: UNCSD key sustainability indicators / themes

Table A.2: Key indicators / themes suggested by UNCSD testing countries priorities

Social	Environmental
Education	Freshwater/groundwater
Employment	Agriculture/secure food supply
Health/water supply/sanitation	Urban
Housing	Coastal Zone
Welfare and quality of life	Marine environment/coral reef protection
Cultural heritage	Fisheries
Poverty/Income distribution	Biodiversity/biotechnology
Crime	Sustainable forest management
Population	Air pollution and ozone depletion
Social and ethical values	Global climate change/sea level rise
Role of women	Sustainable use of natural resources
Access to land and resources	Sustainable tourism
Community structure	Restricted carrying capacity
Equity/social exclusion	Land use change
Economic	**Institutional**
Economic dependency/Indebtedness/ODA	Integrated decision-making
Energy	Capacity building
Consumption and production patterns	Science and technology
Waste management	Public awareness and information
Transportation	International conventions and cooperation
Mining	Governance/role of civic society
Economic structure and development	Institutional and legislative frameworks
Trade	Disaster preparedness
Productivity	Public participation

Source: UNCSD, 1999, Indicators of Sustainable Development: Framework and Methodologies, http://www.un.org/esa/sustdev/indisd/english/english.htm.

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Praaning Meines	rue Franklin 108, 1000 Bruxelles.	WEBBER	David		
Pricewaterhouse Coopers Europe	Av. De Cortenbergh 75, 1040 Bruxelles	GERMAIN	Gilbert		
REPSOL YPF	327 Avenue Louise 10 étage, 1050 Bruxelles.	BLANCO MARTIN	Daniel		
Siemens AG	Otto-Hahn-Ring 6, 81730 Munich.	HARTMANN	Ulrich		
sj berwin	square de meuus 19, 3, 1050 Bruxelles.	CARRAU	javier guillem		
Sogerom SA	Cite Grand-Duc Jean, 7233 Luxembourg.	DE GROOTE	Bruno		
Spanish Chambers of Commerce	rue de Luxembourg 19-21, 1000 Bruxelles	ESTEVAN	Francisco		

	Address	Surname	Forename	Position	E-mail
SPIM & CETM	Bld Lemmonier 20, 1000 Bruxelles	MICHEJDA			
Telefonica	Plaza del Callao 5 9th floor, 28013 Madrid.	COCINA	Carlos Rodriguez		
Toy industries of Europe	Av. des Arts 58, 1000 Bruxelles	BRUGGINK	Maurits		
UEAPME	rue Jacques de Lalaing 4, 1040 Bruxelles	VILAR	Elena		
UNICE	rue Joseph II, 40, 1000 Bruxelles	FINAT	Carlos Gonzalez		
White & Case	rue de la Loi 62, 1040 Bruxelles.	ARRIOLA	Iker		

List of Contacts referred to in Section 15 (*Sector study: Services, Foreign Direct Investment and Intellectual Property*)

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- Philippe Ferreira Portela, Consultant, Special Studies Unit of the Executive Secretary's Officer, UN-ECLAC: fferreira@eclac.cl
- Astrid Hornig Hollstein, Asistente Gerencia General, Cámara de Comercio de Santiago:
- AHornig@ccs.cl (on behalf of Claudio Ortiz, Executive Director)
- Greg McGuire, Economic Insights Pty Ltd: GMcGuire@economicinsights.com.au, formerly with the Australian Productivity Commission
- Nanno Mulder, OECD: Nanno.Mulder@oecd.org - formerly with CEPII, and ECLAC
- Jaime Andres Nino, Consultant to the US CSI and the Mark Twain Institute: JANino@sitrends.org
- Francisco Javier Prieto, FPrieto@direcon.cl
- Robert M Stern, Professor, University of Michigan: RMStern@umich.edu and

- www.Fordschool.umich.edu/rsie/workingpapers/wp.html
- Jasmin Tacoa-Vielma, Legal Affairs Officer, Trade In Services Division, WTO, Jasmin.Tacoa-vielma@wto.org
- María José Acosta MAcosta@eclac.cl
- Ignacio Fernandez, Dirección de Relaciones Económicas Internacionales (Direcon): ifernan@direcon.cl and www.direcon.cl
- Sebastian Saez: saezcabezas@entelchile.net or ssaez@minecon.cl
- Sherry M Stephenson, Deputy Director - Trade Unit, Organisation of American States: SStephenson@oas.org

The report was also disseminated to the following organisations in Chile

Organisation	Description	Website	E-mail
ACCIÓN	Sitio de la Asociación Chilena de ONGs destinado a brindar informaciones a sus asociados y a la sociedad civil en general.	http://www.sociedadcivil.cl/accion	accion@adsl.tie.cl
ACHNU - ASOCIACIÓN CHILENA PRO NACIONES UNIDAS	actividades relativas a la difusión de los Convenios y Resoluciones de la ONU por medio de la implementación de proyectos sociales, el desarrollo de investigaciones y publicaciones y la participación en foros nacionales.	http://www.achnu.cl	achnu@achnu.cl
CASA DE LA PAZ	Potenciar la capacidad de las personas organizadas para mejorar la calidad de vida a través del cuidado del medio ambiente y la convivencia democrática	http://www.casapaz.cl	casapaz@casapaz.cl
Centro de Análisis de Políticas Públicas, CAPP, Universidad de Chile	Centro de Análisis de Políticas Publicas, CAPP de la Universidad de Chile contribuye a la construcción de estado y ciudadanía a través de la investigación, de estudios y de propuestas para asumir la búsqueda de respuestas participativas a los grandes temas de país.	http://www.sociedadcivil.cl/ciudadania2000	capp@uchile.cl
COLOQUIO PERMANENTE SOBRE POLÍTICA INDÍGENA EN CHILE		http://www.sociedadcivil.cl/politicaindigena	indigena@fes.cl
COMISIÓN NACIONAL DEL MEDIO AMBIENTE - CONAMA	de Chile desde el modelo vigente hacia un desarrollo basado en criterios de sustentabilidad	http://www.conama.cl	informaciones@conama.cl
Comité Nacional Pro Defensa de la Fauna y Flora, CODEFF	Comité Nacional Pro Defensa de la Fauna y Flora	http://www.codeff.cl	presidencia@codeff.cl

Organisation	Description	Website	E-mail
Comité Nacional Pro Defensa de la Fauna y Flora, CODEFF	CODEFF, Comité Nacional Pro Defensa de la Flora y Fauna, organismo no gubernamental, depositario de una historia de protagonismo pionero en iniciativas de conservación del medio ambiente constata en terreno y denuncia en su diario quehacer los activos procesos de degradación ambiental los cuales afectan nuestra salud, calidad de vida y futuro.	http://www.sociedadcivil.cl/ciudadania2000	mcpinto@vtr.net
CONAF	Corporación Nacional Forestal (CONAF)	http://www.conaf.cl	consulta@conaf.cl
CORPORACIÓN FPP SUR	dedicado a la construcción de conocimientos y a la práctica en el ámbito del desarrollo social	http://www.sitiosur.cl	corporacionsur@sitiosur.cl
DIALOGOS PARA EL FORTALECIMIENTO DEL TERCER SECTOR Y LA COOPERACION PUBLICO-PRIVADA		http://www.sociedadcivil.cl/dialogos	canelo@rdc.cl; casapaz@casapaz.cl
DIARIO DE LA SOCIEDAD CIVIL	Diario electrónico mantenido en forma colectiva por las organizaciones de la sociedad civil de Chile	http://www.sociedadcivil.cl/nuevodiario	diario@sociedadcivil.cl
EARTHACTION NETWORK	Latin American Coordination	http://www.earthaction.org/es	santiago@earthaction.tie.cl
El Servicio de Cooperación Técnica - SERCOTEC	promover el desarrollo de las micro y pequeñas empresas y fortalecer la capacidad de gestión de sus empresarios	http://www.sercotec.cl	sercotec@sercotec.cl
FED. NACIONAL DE PROFESIONALES UNIVERSITARIOS DE SERV. DE SALUD - FENPRUSS	Sitio oficial de la organizacion gremial de los profesionales universitarios del sistema publico de salud	http://www.fenpruss.cl	fenpruss@fenpruss.cl
FLACSO	Facultad Latinoamericana de Ciencias Sociales	http://www.flacso.cl	ppardo@flacso.cl
FONDO DE LAS AMÉRICAS		http://www.sociedadcivil.cl/fdla	josorio@fdla.cl

Organisation	Description	Website	E-mail
FORO CIUDADANO AMBIENTAL (FCA)	El FCA es un espacio de las organizaciones de la sociedad civil preocupada del fortaleciendo la participación ciudadana para transformar la crisis ambiental en una oportunidad para la democracia, el desarrollo sostenible y el medio ambiente	http://www.sociedadcivil.cl/fca	foroca@yahoo.com
FORO DE LA SOCIEDAD CIVIL	Sitio web del Comité Pro Foro de la Sociedad Civil	http://www.sociedadcivil.cl/foro	foro@sociedadcivil.cl
FUNDACIÓN INSTITUTO INDÍGENA	apoyar y respaldar al Pueblo Mapuche en su proceso de búsqueda de reconocimiento, respeto, dignidad, desarrollo y justicia	http://www.fii.co.cl	fii@telsur.cl
FUNDACIÓN LAURA RODRÍGUEZ		http://www.laurarodriguez.cl	fundacion@laurarodriguez.cl
FUNDACIÓN TERRAM	Terram promueve la reflexión y la investigación, así como propuestas que estimulen la indispensable renovación del pensamiento político, social y económico del país	http://www.terram.cl	info@terram.cl
GOBERNACIÓN PROVINCIAL DE ARAUCO	Sitio Oficial de la Gobernación. Proyectos, Noticias, Fomento, Turismo	http://garauco.interior.gov.cl	garauco@interior.gov.cl
INSTITUTO DE PROMOCIÓN AGRARIA	para contribuir a mejorar la calidad de vida de la familia campesina	http://www.inproa.cl	inproa.central@entelchile.net
ISIS -Servicio de Informaction y Communicacion de las Mujeres	Servicio de información y comunicación de las mujeres que tiene como objetivo lograr la plena participación de las mujeres en los procesos de desarrollo	www.isis.cl	isis@isis.cl
MOVIMIENTO MUNDIAL DE MADRES CHILE	Organización no gubernamental que busca destacar el rol de la mujer - madre en la sociedad, como aporte constante a la cultura del país.	http://www.sociedadcivil.cl/madreschile	mmmadres@yahoo.com
ONG CHILE	El Portal de las ONGs	http://www.ong.cl	info@ong.cl

Organisation	Description	Website	E-mail
ONG FORJA	FORJA se ha propuesto como misión institucional lograr la expresión y participación más plena de la Ciudadanía a través del Derecho para favorecer el Desarrollo y la justicia para Todos.	http://www.forja.cl	ongforja@entelchile.net
PROGRAMA CHILE SUSTENTABLE	impulsar la elaboración de una propuesta ciudadana para la transformación social, política y económica	http://www.chilesustentable.net	info@chilesustentable.net
PROGRAMA DE ECONOMÍA DEL TRABAJO	Su finalidad principal es contribuir a un desarrollo equitativo y sustentable que permita la superación de la pobreza.	http://www.petchile.cl	http://www.petchile.cl/
PROGRAMA DE LAS NACIONES UNIDAS PARA EL DESARROLLO - PNUD		http://www.pnud.cl	claudia.corvalan@pnud.cl
PROYECTO GESTIÓN AMBIENTAL LOCAL PARTICIPATIVA PARA EL DESARROLLO SUSTENTABLE		http://www.sociedadcivil.cl/arauco	canelo@rdc.cl
RED DE ONGS DE INFANCIA CHILE	Red nacional de ONGs que trabajan en los temas de Infancia y adolescencia	http://www.geocities.com/infanciachile/	onginfancia@123.cl
RED NACIONAL DE ACCIÓN ECOLÓGICA RENACE	Coordina la realización de acciones comunes que contribuyan a la solución de problemas ambientales que aquejan a chile	http://www.renace.cl	secretaria@renace.cl
RIDES	Research and Resources for Sustainable Development	http://www.rides.cl	info@rides.cl
RITS - REDE DE INFORMAÇOES PARA O TERCEIRO SECTOR	Oferecer informações sobre o terceiro setor e acesso democrático à tecnologia de comunicação e gerência do conhecimento	http://www.rits.org.br	rits@rits.org.br
SOCIEDAD PALEONTOLÓGICA DE CHILE - SPACH		http://www.spach.cl	spach_chile@hotmail.com

Annex 5: Trade Agreement

This section is a brief summary of the "Agreement Establishing an Association between The European Community and its Member States, of the one part, and the Republic of Chile, of the other part" (FINAL 10.06.02 15.43h).

We will focus here on products that were not freely tradable before the entry into force of the agreement. Categories of products that were not subject to customs duties or tariff quota, prior to the EU-Chile trade agreement, are not examined.

1. Custom duties

Fish and fisheries products

This sub-section applies to fish and fisheries products as covered by Chapter 3 of the Harmonized System (HS), HS Headings 1604 and 1605, HS Sub-Headings 051191 and 230120, as well as ex190220.

- Customs duties on fish and fisheries imports originating in Chile

Customs duties on imports into the Community of fish and fisheries products originating in Chile will have a different treatment according to the product considered. Products can belong to several categories, "Year 0", "Year 4", "Year 7","Year 10" and "TQ".

Custom duties on products that belong to the first four categories shall be gradually eliminated in accordance with the following timetable, so that these customs duties are completely eliminated by the entry into force of this Agreement, 1 January 2007, 1 January 2010 and 1 January 2013, respectively:

Table A.5.1: Percentages of annual tariff reduction for fish products originating in Chile

Category	Entry into force	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Year 0	100%										
Year 4	20%	40%	60%	80%	100%						
Year 7	12,5%	25%	37,5%	50%	62,5%	75%	87,5%	100%			
Year 10	9%	18%	27%	36%	45%	54%	63%	72%	81%	90%	100%

For products that belong to the "TQ" category, tariff quotas on imports shall be applied as from entry into force of this Agreement. These quotas shall be managed on a first-come first-served basis.

Table A.5.2: Proportion of fish products originating in Chile free from customs duties

Category of tariff evolution	Proportion of products concerned
Free from custom duties by entry into force	22.0 %
Free from custom duties by 2007	38.7 %
Free from custom duties by 2010	2.9 %
Free from custom duties by 2013	33.7 %
Total of products free from custom duties by 2013	97.3 %
Products with tariff quotas by 2013	2.7 %

Table A5.2 shows that, by 2013, 97.3% of fish products originating in Chile will be free from custom duties.

- Customs duties on fish and fisheries imports originating in the Community

For some products, customs duties on imports into Chile of fish and fisheries products originating in the Community shall be eliminated at the entry into force of the Agreement.

For the others, tariff quotas shall be applied as from entry into force of this Agreement. These quotas shall be managed on a first-come first-served basis.

Table A.5.3: Proportion of fish products originating in the Community free from customs duties

Category of tariff evolution	Proportion of products concerned
Free from custom duties by entry into force	96.0%
With tariff quotas	4%
All products	100%

With the agreement, 96% of fish products originating in the community will be free from customs duties, immediately after the entry into force of the agreement. For 4% of fish products originating in the community, tariff quotas will be maintained.

Industrial products

This section applies to products of HS Chapters 25-97 not covered by agricultural and processed agricultural products as defined in Article 70.

- Customs duties on industrial imports originating in Chile

Customs duties on imports into the Community of industrial products originating in Chile will evolve according to two different timetables, depending on the product categorization, either "Year 0" or "Year 3". Customs duties shall be eliminated in accordance with the following timetable, so that these customs duties are completely eliminated by the entry into force of the Agreement and on 1 January 2006, respectively:

Table A.5.4: Percentages of annual tariff reduction for industrial products originating in Chile

Category	Entry into force	2004	2005	2006
Year 0	100%			
Year 3	25%	50%	75%	100%

- Customs duties on industrial imports originating in the Community

Customs duties on imports into Chile of products originating in the Community will be reduced differently, according to the concerned product. Three categories are distinguished, "Year 0", "Year 5" and "Year 7". Customs duties shall be eliminated in accordance with the following timetable, so that these customs duties are completely eliminated by the entry into force of this Agreement, 1 January 2008 and 1 January 2010, respectively:

Table A.5.5: Percentages of annual tariff reduction for industrial products originating in the Community

Category	Entry into force	2004	2005	2006	2007	2008	2009	2010
Year 0	100%							
Year 5	16,7%	33,3%	50%	66,7%	83,3%	100%		
Year 7	12,5%	25%	37,5%	50%	62,5%	75%	87,5%	100%

Agricultural and processed agricultural products

This subsection applies to agricultural and processed agricultural products as covered by Annex I of the WTO Agreement on Agriculture.

- Customs duties on agricultural and processed agricultural imports originating in Chile

Customs duties will evolve differently, according to the product considered.

1) For products belonging to categories "Year 0", "Year 4", "Year 7" and "Year 10", custom duties shall be eliminated in accordance with the following timetable, so that these customs duties are completely eliminated by the entry into force of this Agreement, 1 January 2007, 1 January 2010 and 1 January 2013, respectively:

Table A.5.6: Percentages of annual tariff reduction for agricultural and processed agricultural products originating in Chile, belonging to categories Year 0", "Year 4", "Year 7" and "Year 10"

Category	Entry into force	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Year 0	100%										
Year 4	20%	40%	60%	80%	100%						
Year 7	12,5%	25%	37,5%	50%	62,5%	75%	87,5%	100%			
Year 10	9%	18%	27%	36%	45%	54%	63%	72%	81%	90%	100%

2) For the agricultural products classified in category “EP”, liberalisation concerns *ad valorem* duty only, specific duty linked to the entry price is maintained. This liberalisation can be effective at the entry into force of the agreement, or be implemented gradually, over a transitional periods, that can be either 4, 7 or 10 years.

3) For agricultural and processed agricultural products belonging to category “SP” liberalisation will concern *ad valorem* duty only, while specific duty is maintained. This liberalisation will be effective at the entry into force of the agreement.

4) For processed agricultural products under “R” category, the Community shall allow imports with a customs duty of 50% of the basic customs duty as from the entry into force of this Agreement.

5) For agricultural and processed agricultural products listed under category “TQ”, there is liberalisation within a tariff quota. For processed agricultural products, quantities allowed for duty free imports are augmented by the entry into force of the Agreement, or they regularly increase (5% or 10% per year).

6) “PN” products are covered by denominations protected in the Community. Tariff concessions shall not apply to them.

Table A.5.7: Proportion of agricultural and processed agricultural products originating in Chile free from customs duties

Category of tariff evolution	Proportion of products concerned
Free from custom duties by entry into force	34.0%
Free from custom duties by 2007	15.1%
Free from custom duties by 2010	12.2%
Free from custom duties by 2013	7.7%
Total of products without custom duties in 2013	69.1%
EP products	4.2%
SP products	4.1%
R products	0.5%
TQ products	16.6%
PN products	5.5%
All products	100%

By 2013, 69.1% of agricultural products originating in Chile will be free from customs duties for imports into the Community.

- Customs duties on agricultural and processed agricultural imports originating in the Community

The evolution of customs duties on agricultural and processed agricultural imports originating in the Community will differ according to the product considered.

1) Customs duties on imports into Chile of agricultural and processed agricultural products originating in the Community under category "Year 0", "Year 5" and "Year 10" shall be eliminated in accordance with the following timetable, so that these customs duties are completely eliminated by the entry into force of this Agreement, 1 January 2008 and 1 January 2013, respectively:

Table A.5.8: Percentages of annual tariff reduction for agricultural and processed agricultural originating in the Community, belonging to categories Year 0", "Year 5" and "Year 10"

Category	Entry into force	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Year 0	100%										
Year 5	16,7%	33,3%	50%	66,6%	83,3%	100%					
Year 10	9%	18%	27%	36%	45%	54%	63%	72%	81%	90%	100%

2) Tariff quotas on imports into the Community of certain agricultural products originating in Chile listed under category "TQ" shall be applied as from the entry into force of this Agreement. These quotas shall be managed on a first-come first served basis.

Table A.5.9: Proportion of agricultural and processed agricultural products originating in the Community free from customs duties

Category of tariff evolution	Proportion of products concerned
Free from custom duties by entry into force	82.2%
Free from custom duties by 2008	7.7%
Free from custom duties by 2013	8.5%
Total of products free from custom duties by 2013	98.4%
With tariff quotas by 2013	1.6%

By 2013, more than 98% of agricultural and processed agricultural products originating in the Community will be free from duties.

- Agricultural and processed agricultural emergency clause

If, given the particular sensitivity of the agricultural markets, a product originating in a Party is being imported into the other Party in such increased quantities and under such conditions as to cause or threaten to cause serious injury or disturbance in the markets of like or directly competitive products of the other Party, that Party may take appropriate measures under the conditions and in accordance with the procedures laid down in this Article. In such conditions the importing Party may suspend the further reduction of any customs duties or increase the customs duty on the product.

2. Non-tariff measures

Services

This Chapter applies to trade in all services sectors with the exception of:

- Audio-visual services
- National maritime cabotage
- Air transport services

- Market access

In sectors where market-access commitments are undertaken, the measures which a Party shall not maintain or adopt either on the basis of a regional subdivision or on the basis of its entire territory, unless otherwise specified in its Schedule, are defined as:

1) Limitations on the number of services suppliers
2) Limitations on the total value of service transactions or assets

3) Limitations on the total number of service operations or on the total quantity of service output
4) Limitations on the total number of natural persons that may be employed in a particular service sector or that a service supplier may employ
5) Measures, which restrict or require specific types of legal entities or joint ventures through which a service supplier of the other Party may supply a service
6) Limitations on the participation of foreign capital

- National treatment

Each Party shall grant to services and service suppliers of the other Party, in respect of all measures affecting the supply of services, treatment no less favourable than that it accords to its own like services and services suppliers.

- Specific commitments

In some sectors, each Party undertakes some specific commitments, which concern:

1) Terms, limitations and conditions on market access
2) Conditions and qualifications on national treatment
3) Where appropriate the time-frame for implementation of such commitments and the date of entry into force of such commitments.

In the EU-Chile trade agreement, several non-tariff measures are evoked: National treatment, customs and related matters, standards, rules of origin, technical regulations and conformity assessment procedures, Sanitary and Phytosanitary (SPS) measures, Intellectual Property Rights (IPR) concerns.

National treatment

The national-treatment provision contains the obligation to treat foreign suppliers and domestic suppliers in the same manner. However, it does provide the possibility of different treatment being accorded the providers of other parties to that accorded to domestic providers. However, in such cases the conditions of competition should not, as a result, be modified in favour of the domestic providers.

The EU-Chile agreement states that the imported products of the territory of the other Party shall not be subject, either directly or indirectly, to internal taxes or other internal charges of any kind in excess of those applied, directly or indirectly, to like domestic products. Moreover, the Parties shall not otherwise apply internal taxes or other internal charges so as to afford protection to domestic production.

The imported products of the territory of the other Party shall be accorded treatment no less favourable than that accorded to like domestic products in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use.

The implementation of the agreement should then improve the access of Chile to EU markets, and the access of EU Members to the Chilean market.

Customs valuation

Customs valuation can be considered as a non-tariff barrier to trade because it makes importations of foreign goods more difficult. Each importer has to estimate the value of a product at customs, which represents problems that can be just as serious as the actual duty rate charged.

The EU-Chile agreement stipulates that customs valuation rules applied to trade between the Parties shall be governed by the WTO Agreement on Implementation of Article VII of the GATT 1994. The objective is to reach common views regarding the application of valuation criteria, the use of indicative or reference indices, operational aspects and working methods.

This harmonization is likely to simplify imports procedures and to facilitate the development of bilateral relations between EU and Chile.

Rules of origin

"Rules of origin" are the criteria used to define where a product was made. They are an essential part of trade rules because a number of policies discriminate between exporting countries: quotas, preferential tariffs, anti-dumping actions, countervailing duty (charged to counter export subsidies), and more.

The EU-Chile agreement will lead to the creation of a Special Committee on Customs Co-operation and Rules of Origin. This Committee aims at:

1) Providing a forum to consult and discuss on all issues concerning, in particular rules of origin and related customs procedures.
2) Enhancing co-operation on the development, application and enforcement of rules of origin and related customs procedures

The implementation of this Committee should lead to a convergence in EU and Chilean rules of origins, which may conceivably favour facilitate trade between the two Parties.

Standards, technical regulations and conformity assessment procedures

Technical regulations and product standards vary from one country to another. This constitutes a barrier to trade for producers and exporters. Such divergences in standards and technical regulations may be used as a means of implementing protectionist measures.

The objective of the EU-Chile trade agreement is to facilitate and increase trade in goods by eliminating and preventing unnecessary barriers to trade coming from divergences in Standards, technical regulations and conformity assessment procedures.

The Parties shall intensify their bilateral co-operation in the field of standards, technical regulations and conformity assessment with a view to facilitating access to their respective markets, by increasing the mutual knowledge, understanding and compatibility of their respective systems.

In their bilateral co-operation the Parties shall aim at identifying which mechanisms or combination of mechanisms are the most appropriate for particular issues or sectors. Such mechanisms include aspects of regulatory co-operation, *inter alia*, convergence and/or equivalence of technical regulations and standards, alignment to international standards, reliance on the supplier's declaration of conformity and use of accreditation to qualify conformity assessment bodies, as well as mutual recognition agreements.

To this end, the Parties shall work towards:

1) Developing common views on good regulatory practices;
2) Reinforcing regulatory co-operation through, for example, exchange of information, experiences and data, as well as scientific and technical co-operation with a view to improving the quality and level of their technical regulations and making efficient use of regulatory resources;
3) Compatibility and/or equivalence of their respective technical regulations, standards and conformity assessment procedures;
4) Promoting and encouraging bilateral co-operation between their respective organisation, public and/or private, responsible for metrology, standardisation, testing, certification and accreditation;
5) Promoting and encouraging full participation in international standard setting bodies, and reinforcing the role of international standards as a basis for technical regulations; and
6) Increasing their bilateral co-operation in the relevant international organisations and fora dealing with the issues covered by this section.

All products are concerned by this agreement on standards, technical regulations and conformity assessment procedures, except those relevant to the SPS agreement (see below). The reduction of these non-tariff barriers to trade should facilitate exports from one Party to another, and then encourage the development of EU-Chile trade.

Sanitary Phytosanitary (SPS) measures

According to the WTO, SPS measures should be applied only to the extent necessary to protect human, animal or plant life or health. And they should not arbitrarily or unjustifiably discriminate between countries where identical or similar conditions prevail. […] SPS measures, by their very nature, may result in restrictions on trade […] governments are sometimes pressured to go beyond what is needed for health protection and to use sanitary and phytosanitary restrictions to shield domestic producers from economic competition. Such pressure is likely to increase as other trade barriers[132].

The objective of the EU-Chile trade agreement is to facilitate trade in animals and animal products, plants, plant products and other goods between the Parties, whilst safeguarding public, animal and plant health, by means of:

1) Ensuring full transparency as regards sanitary and phytosanitary measures applicable to trade;
2) Establishing a mechanism for the recognition of equivalence of such measures maintained by a Party consistent with the protection of public, animal and plant health;
3) Recognition of the health status of the Parties and applying the principle of regionalisation[133];
4) Establishing mechanisms and procedures for trade facilitation;
5) Improving communication and co-operation between the Parties on sanitary and phytosanitary measures.

The implementation of the SPS agreement should facilitate imports of each Party originating in the other Party for all the products covered by this agreement, listed in tables 2.10 and 2.11 below. We should then observe a development of bilateral trade between EU and Chile for all these commodities.

Table A.5.10: Coverage of sanitary measures

Live animals		Products of live animals	
Equidae	Bovine animals	Fresh meat of domestic species and game	Meat products
Ovine caprine animals	Porcine animals	Liquid and powdered milk	Milk products)
Poultry	Live fish	Fishery products	Eggs, egg products
Crustaceans	Molluscs	Bees products	Snails and frogs' legs
Eggs of live fish	Hatching eggs	Hides, skins of ungulates	Bones, horns, hooves
Semen-ova-embryos	Other mammals	Gelatine	Processed animal proteins
Other birds	Reptiles	Blood and blood products	Pathogenic agents
Amphibians	Other vertebrates	Other animal waste	Pet food
Bees		Processed and unprocessed manure	

[132] See WTO site for SPS concerns, http://www.wto.org/english/tratop_e/sps_e/spsund_e.htm.

[133] See the article 6 of the WTO SPS agreement.

Table A.5.11: Coverage of phytosanitary measures

Plants and plant products which are potential carriers of pests
Packaging, conveyances, containers, soil and growing mediums and any other organisms, object or material capable of harbouring or spreading pests

Protection of intellectual property rights (IPR)

IPR concerns have an important place in a trade agreement. It is important that measures are taken aiming at:

Reducing distortions and impediments to international trade

Taking into account the need to promote effective and adequate protection of intellectual property rights

To ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade.

In the EU-Chile trade agreement, intellectual property rights embodies:

- Copyright – including copyright in computer programs and in databases
- Neighbouring rights
- The rights related to patents
- Industrial designs
- Geographical indications including appellation of origins
- Trademarks
- Layout-designs (topographies) of integrated circuits
- Protection of undisclosed information and the protection against unfair competition as referred to in Article 10 bis of the Paris Convention for the Protection of Industrial Property (Stockholm Act 1967).

According to the agreement, the Parties shall grant and ensure adequate and effective protection of intellectual property rights in accordance with the highest international standards, including effective means of enforcing such rights provided for in international treaties.

The Parties shall:

Continue to ensure an adequate and effective implementation of the obligations arising from main international conventions:

- WTO Agreement on Trade-related Aspects of Intellectual Property (1994)
- Paris Convention for the Protection of Industrial Property (1967)
- Berne Convention for the Protection of Literary and Artistic Works (1971)
- Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations (1961)
- 1978 UPOV Convention
- 1991 UPOV Convention).

By 1 January 2007 accede to and ensure an adequate and effective implementation of the obligations arising from the following multilateral conventions:

- Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of Registration of Marks (Geneva Act, 1977)
- World Intellectual Property Organization Copyright Treaty (1996)
- World Intellectual Property Organization Performances and Phonograms Treaty (1996)
- Patent Co-operation Treaty (1970)
- Strasbourg Agreement Concerning the International Patent Classification (1971).

By 1 January 2009 accede to and ensure an adequate and effective implementation of the obligations arising from the following multilateral conventions:

- Convention for the Protection of Producers of Phonograms against the Unauthorised Reproduction of their Phonograms (1971)
- Locarno Agreement establishing an International Classification for Industrial Designs (1968)
- Budapest Treaty on the International Recognition of the Deposit of Micro-organisms for the Purposes of Patent Procedure (1977)
- Trademark Law Treaty (1994)

Make every effort to ratify and ensure an adequate and effective implementation of the obligations arising from the following multilateral conventions at the earliest possible opportunity

- Protocol to the Madrid Agreement concerning the International Registration of Marks (1967)
- Madrid Agreement concerning the International Registration of Marks (1967)
- The Vienna Agreement establishing an International Classification of Figurative Elements of Marks (1973).