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**TRADE SIA OF THE ASSOCIATION AGREEMENT UNDER
NEGOTIATION BETWEEN THE EUROPEAN COMMUNITY
AND MERCOSUR**

AGRICULTURE SECTOR STUDY

MID TERM REPORT

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Principal authors:

Bénédicte Hermelin, Benoît Fauchoux
GRET

Trade SIA EU-Mercosur Partners

IARC, Institute for Development Policy and Management (IDPM), University of Manchester
Chaire Mercosur
Copenhagen Economics
ECOSTRAT Consultants, Brazil
GRET (Groupe de Recherche et d'Echanges Technologiques)
Land Use Consultants
Natural Resources Institute, University of Greenwich
WISE Development (Women in Sustainable Enterprise Development)

Project website: <http://www.sia-trade.org/mercotur>

Project email address: sia-trade@man.ac.uk



GRET



COPENHAGEN ECONOMICS

Ecostrat
Consultores

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EXECUTIVE SUMMARY

This report aims to realize a sustainability impact assessment of an EU-Mercosur Association Agreement on agriculture. The study employs two scenarios: a baseline scenario (no change in current trade measures and continuation of existing trends) and a further liberalisation scenario (strongest probable implementation of an EU–Mercosur trade agreement for agriculture).

The impacts of the liberalisation scenario on sustainability are assessed using causal chain analysis and empirical evidence, supported by a general equilibrium economic model (the Copenhagen Economics Trade Model, CETM), to give an indication of the outer bound magnitude of the static equilibrium economic effects. To contribute to the overall assessment two products have been selected for more detailed study: beef meat and ethanol. Mercosur beef production is highly competitive, and Mercosur ethanol production has the potential to contribute to reducing fossil-fuel use and climate change.

Overview of agriculture sector in the EU and in Mercosur

Mercosur agriculture is more competitive than in the EU and could develop very quickly. Meanwhile, agriculture in the EU is still a significant economic sector in rural areas. Farm employment is concentrated in countries such as Poland, Italy, Spain, France and Hungary, which account for nearly the two-thirds of the total EU agricultural labour force.

Gross Value Added of agriculture is also concentrated. France, Italy, Spain, Germany and the UK account for over two thirds of EU-25 agricultural value added. Agricultural production in the EU-25 is relatively well-balanced between crop products and animal products. The EU-25 is one of the main world producer of cereals (except for rice and maize), sugar, some fruits and vegetables, meats and dairy products. The EU food and drink industry is the largest manufacturing sector, ahead of the automobile and chemical industries. Small and medium enterprises are common in the sector.

The agricultural sector is a key component of Mercosur economies. In all the member states, agriculture accounts for more than 10% of GDP, with rapid growth in all the countries except Paraguay. Agriculture is also a major source of employment in Mercosur countries, directly and indirectly. Agriculture in Mercosur is characterised by a very competitive and modern commercial agriculture, alongside traditional family farms and landless farmers. Mercosur countries, especially Argentina and Brazil, are considered as major players of world agricultural production, both for crops and animal products. Mercosur represents 8% of world maize supply, and accounts for around 40% of soya bean world production. Brazil is the major world sugar cane producer, and its production has tripled since 1999. Mercosur produces almost 20% of world beef meat production. Chicken meat production is increasing in Brazil, and accounted for 13% of the world production in 2004.

Trade flows

Food and agricultural commodities represent over half Mercosur exports to the EU, and Mercosur is one of the main suppliers of food products to the EU (accounting for a fifth of EU agricultural and food imports). By contrast, EU agricultural exports to Mercosur represent less than 3% of EU exports. Intra-regional trade is another difference between EU and Mercosur. Most of the imports and exports of individual EU Member States are intra-EU, whereas intra-Mercosur trade represents only 10% of exports. Whiskies, wines, olive oil and malt are among the main European agricultural products exported to Mercosur.

Trade measures

Many products exported by Mercosur countries such as soya bean products and ‘tropical’ products (coffee, cocoa, mangoes) are subject to few or no tariffs when entering the European market. For other products such as sugar, meat and fruits market access is restricted by restrictions including tariffs,

tariff-quotas, entry prices and seasonal tariff rates. Mercosur products also have to comply with EU standards to ensure a high level of security for European health, veterinary health and environmental health.

Bound tariffs were lowered following the Uruguay Agreement on Agriculture. The Mercosur common external tariff (CET) – the applied tariff - is in many cases lower than the bound rates. Currently, no Mercosur tariff applied on agricultural products exceeds 20%, although bound tariffs for some products are higher. Whiskies and wines, EU's main exports to Mercosur, are both subject to the rate of 20%. EU exports need also to comply with Mercosur regulations.

First results of the Sustainability Impact Assessment

The impact assessment carried out at this mid-term stage of the project has identified both beneficial and potentially adverse impacts of the proposed EU-Mercosur trade agreement on a range of economic, social and environmental factors which contribute to sustainable development. For many of these the study has also identified key factors which are associated with enhancing beneficial impacts and avoiding or mitigating adverse ones. Further analysis of potential mitigating and enhancement measures will be undertaken in the remainder of the project.

Sustainability impacts in the EU

A beneficial economic impact is expected from lower consumer prices and an improvement in static economic efficiency, but the effect is small compared with normal growth rates and the benefit expected to arise through the dynamic effects of switching resources to more competitive sectors of the economy.

The expected economic gains are associated with increased imports from Mercosur and lower agricultural production in the EU. Competition is likely to be felt most keenly for sugar and poultry meat. The beef and fruit sectors are also affected, but EU producers of these have greater potential for product differentiation. EU chicken producers would benefit from lower wheat prices, but this may not offset the competitive advantage of Mercosur producers. There would also be a knock-on effect for domestic wheat prices. The potential for increased imports of ethanol is high, to the disadvantage of biofuel production from EU feedstocks.

Although the overall effect for EU agricultural production is adverse, liberalisation of Mercosur imports would be beneficial for some EU products such as wine, olive oil and spirits.

The impacts on employment in the EU arising from the production changes are not expected to be large, but could be significant in local areas. Employment in primary commodity production in the sugar, wheat, chicken, beef and fruit sectors is likely to fall, particularly in the areas of economically marginal production such as uplands. Rural development support in these areas will be a significant mitigating factor. Opportunities for re-employment may be lower in the new member states of the EU-10 compared to the EU-15.

Environmental impacts in the EU are expected to be mixed and relatively small. Reduced agricultural production is expected to have a beneficial overall effect on both pollution impacts and biodiversity, but with potential for some adverse effects associated with increased specialisation and intensification. The EU regulatory framework and rural development policies will be important factors in avoiding or mitigating the adverse effects.

Ethanol produced from sugar cane in Mercosur is significantly more energy efficient than biofuels produced from EU feedstocks. The potential for increased imports of ethanol from Mercosur therefore has a potentially large beneficial impact on greenhouse gas emissions and climate change.

Sustainability impacts in Mercosur

As in the EU, a beneficial economic impact is expected from the static economic efficiency effects, which is potentially large in Paraguay but relatively small in the other Mercosur countries. The biggest long term economic impact is expected to come from the dynamic effects of the trade agreement on the overall development process.

Output is expected to rise significantly for the agricultural sector as a whole, with little adverse impact from reduced barriers to EU imports. Mercosur production is particularly competitive for meat, cereals, sugar, ethanol and fruits, for which exports to the EU are expected to increase. Production in Mercosur is expected to expand in these sectors, allowing the development of agriculture and the food processing industry.

The expected increase in agricultural production will have mixed social effects. Depending on domestic policies, the increased export incentives could lead to higher domestic food prices. Employment in agriculture is expected to rise, taking labour from the rural unemployed and also from the informal sector. Market incentives for increased mechanisation are expected to rise, adding to existing trends towards higher skill levels in the long term, and lower long term agricultural employment. There may also be short to medium term adverse effects on rural poverty associated with the need for additional land. Land tenure is weak in many areas, and informal farmers may be displaced by the expansion of commercial farming. Some of the extra land may come from forest clearance, with loss of livelihoods for indigenous people. A further concern arises from the use of forced labour in cattle raising. This is a current issue in Brazil, where the government is endeavouring to combat it. Without effective mitigation the trade agreement could exacerbate the problem, leading to an increase in the number of forced labourers and an adverse effect on poverty. While liberalisation offers potential for a reduction in rural poverty throughout the region, there could instead be significant adverse effects in some areas in the absence of strengthened regulation. This may include adverse effects on gender equity, associated with potential pressures on traditional small scale farming.

Large areas of the Mercosur region are of global environmental significance, particularly the Amazon and Cerrado. Threats to the Amazon rainforest are well known, while the Brazilian Cerrado is one of the world's most biologically rich areas of savannah. The region also includes important wetlands that are subject to agricultural pressures.

Rising agricultural production in all the Mercosur countries will place additional pressures on land, soil quality and biodiversity, and also on water resources in the semi-arid regions of Argentina. Adverse pollution impacts may also arise in some areas through greater use of agrochemicals and expansion of processing industries, reinforcing needs for stronger regulation. In Brazil the expansion of beef production is expected to have a direct impact on deforestation, while the expansion of sugarcane would have an indirect spillover effect by taking land from products which would move into forested areas. The impact of the trade agreement would add to existing long term pressures on forests which need to be addressed by a stronger regulatory regime.

Among the regulatory measures that may need to be taken in order to avoid significant adverse impacts, a certification scheme for EU ethanol imports is identified as having the potential to make a significant contribution. With appropriate social as well as environmental criteria, this could help to address some of the social concerns as well as the environmental pressures of increased agricultural production.

I. INTRODUCTION

Since the launch of the negotiations of the EU-Mercosur Association Agreement, agriculture is one of the cornerstones of the trade negotiations. Mercosur and EU are two main players in world agricultural markets. Mercosur agriculture is highly competitive in many sectors, and a better access to the EU market should offer opportunities to expand agriculture and the food industry. Nevertheless, agriculture in Mercosur faces several challenges: unequal access to land, continuing poverty in rural areas, and loss of biodiversity due to the expansion of the frontier.

Even if agriculture is less important in the EU economy, it remains important in terms of territorial management, rural development and cultural identity. Agriculture is still one of the main economic activities in some rural areas, especially in Eastern and Central European Countries (including Romania and Bulgaria which joined the EU on the 1st January 2007), and in some regions of old member-states. As far as agriculture is concerned, it can be argued that the historically high level of trade protection applied to many agricultural commodities mean that the EU finds itself in a defensive position in the EU-Mercosur negotiations.

This Sustainability Impact Assessment aims to assess the impact of the trade side of the EU-Mercosur Association Agreement under negotiation for agriculture, both in Mercosur and in the EU. This report is the mid-term report of the agriculture study. It presents: (i) the methodology used in the report; (ii) an overview of agriculture both in the EU and Mercosur; (iii) trade flows of agro-food products between the two regions; (iv) trade-related measures used by the EU and Mercosur; (v) the first results of the impact assessment, including the findings of two case studies, on ethanol and beef; and finally the consultation process.

II. METHODOLOGY

In this report, the agricultural sector is defined by the definition of Annex 1 of the WTO Agreement on Agriculture¹. The study will cover agricultural commodities and food and drink products, excluding fish and fish products.

The study employs two scenarios:

- *Base scenario*: no change in the current negotiated trade measures affecting EU and Mercosur trade, including no agreement on the trade liberalisation measures being discussed in the WTO Doha negotiations. The baseline scenario assumes, therefore, a continuation of existing trends in trade flows and current levels of tariff and non-tariff measures for the agriculture sector
- *Further Liberalisation scenario*: this represents the strongest probable implementation of the EU–Mercosur trade negotiations for the agriculture sector.

Full liberalisation will probably not be the result of the on-going negotiations. For some sub-sectors it is anticipated that tariff rate quotas will be agreed or revised rather than removing tariffs completely. For the purpose of quantification, the economic modelling used in the study assumes full liberalisation to give an outer bound for potential impacts. This is used to help identify significant impacts and more sensitive sub-sectors, both in the EU and Mercosur.

In addition to examining tariffs, other market access measures such as non-tariff barriers, including sanitary and phytosanitary measures, will factor into the SIA although this analysis will be strictly qualitative.

As part of the analysis the impacts of a hypothetical full liberalisation scenario on sustainability are assessed, using a General Equilibrium Trade Model (the CETM), to estimate the effect of full liberalisation on certain aspects of sustainability. The CETM results estimate changes from a baseline situation (current situation) induced by full liberalisation of trade between the two regions. A fuller explanation of the model is given in the overall study.

CETM modelling provides data on changes of output, employment, exports and imports for grains, crops, animal products and processed food, in the EU, distinguishing EU15 and EU10 (10 newcomers), and in the four studied Mercosur countries. It takes into account the changes caused by tariff cuts, services liberalization and trade facilitation.

CETM used the GTAP database, and aggregated the GTAP sectors in four categories, as follows:

Grains: paddy rice, wheat, other cereal grains.

Crops: Vegetables, fruits, nuts, oilseeds, sugar cane, sugar beet, plant-based fibres, other crops. Here, sugar cane and sugar beet cover the plant production and not sugar per se.

Animal products: raw milk, bovine cattle, sheep and goats, horses, other animal products. This category covers unprocessed animal products, that is to say live animals and milk at the farm gate.

Processed foods: bovine meat products, other meat products, vegetable oils and fats, dairy products, processed rice, sugar, other food products, beverages and tobacco products. This category covers all processed products, whatever their level of processing.

¹ The WTO Agreement on Agriculture covers chapters SH1 to SH 21 except fish and fish products, code SH 33.01, SH 35.01 to 35.05; 41.01 to 41.03, SH 43.01, SH 50.01 to 50.03, SH 51.01 to 51.03, SH 52.01 to 52.03, SH 53.01 to 53.02, SH codes 2905.43, 205.44, 3809.10, 3823.60.

This aggregation needs to be taken into account in analysing the results of the modelling. For instance, soya beans are in “crops”, while soya oil-cakes are in “processed foods”. A change in oilcake production, a by-product of oilseeds processing, may be associated with a change in oilseeds production. This remark may be applied to sugar. Both sugar production and ethanol production may be associated with the level of sugar plants production.

Most of the products included in the category “animal products” groups sectors are important in production, but are not extensively traded. For instance international trade in live animals is largely limited to breeding stock and retail sales of raw milk take place only at a local scale (direct sales between farmers and consumers which are declining for sanitary reasons).

Also, most of the agricultural and food products exchanged between the EU and Mercosur are aggregated in “processed foods”, which limits the fineness of the analysis.

The GTAP database used is the version 6.2, available in June 2006. This takes into account the 1992, 2000 and 2003 CAP reforms, but not the EU sugar reform adopted in 2006.

Agriculture is a large sector, and this study will particularly pay attention to products that may have particularly significant impacts from trade liberalisation. The two case-studies focus on beef meat and ethanol.

The consultation process is a key component of a SIA, in order to encourage extensive discussion and debate among key stakeholders. Discussion (mainly using new information and communication technologies) will be helpful to validate or not the main findings, and to propose flanking measures in order to enhance beneficial impacts of the EU-Mercosur Trade Agreement on sustainability and mitigate potentially adverse ones.

III. OVERVIEW OF AGRICULTURE IN THE EU AND MERCOSUR

1. EU Agriculture

In 1995, agriculture, forestry and fisheries gross value added (GVA) represented 2.8% of total GVA in the EU-25. Ten years later it only represents only 1.9% (Eurostat). Nevertheless agriculture remains economically important for some countries such as Poland, Slovakia, Lithuania, Latvia, Greece, and Estonia, of which GVA is from 4% to 5% in 2005. In accession countries too, agriculture is an important economic sector, with a GVA up to 9.3 % for Bulgaria and 10.1% for Romania (Eurostat). Furthermore in other countries, if agriculture is less important at national level, it remains an important activity in some rural areas. It is also important to appreciate the cultural significance of agriculture and foods derived from domestic farm products which, in many member states has a strong influence on consumer demand and public policy (as demonstrated by the increasing use of the EU's protected food names²).

Agriculture represented almost 9.5 millions Annual Work Units (AWU) in the EU-25 in 2005 (see table 3.1 below). In EU-15, agriculture provided 7.1 millions AWU in 1997, declining to 6 millions AWU in 2005. In EU-10, the farm labour force decreased more rapidly in the same period, from 5 millions AWU in 1997 to 3.5 millions AWU in 2005. From 1997 to 2005, the total farm labour force declined by 16% in EU-15, against 30% in EU-10, and 22% in EU-25.

Table 3.1: Evolution of farm labour force in the EU (1997 – 2005) (in thousands of Annual Work Unit)

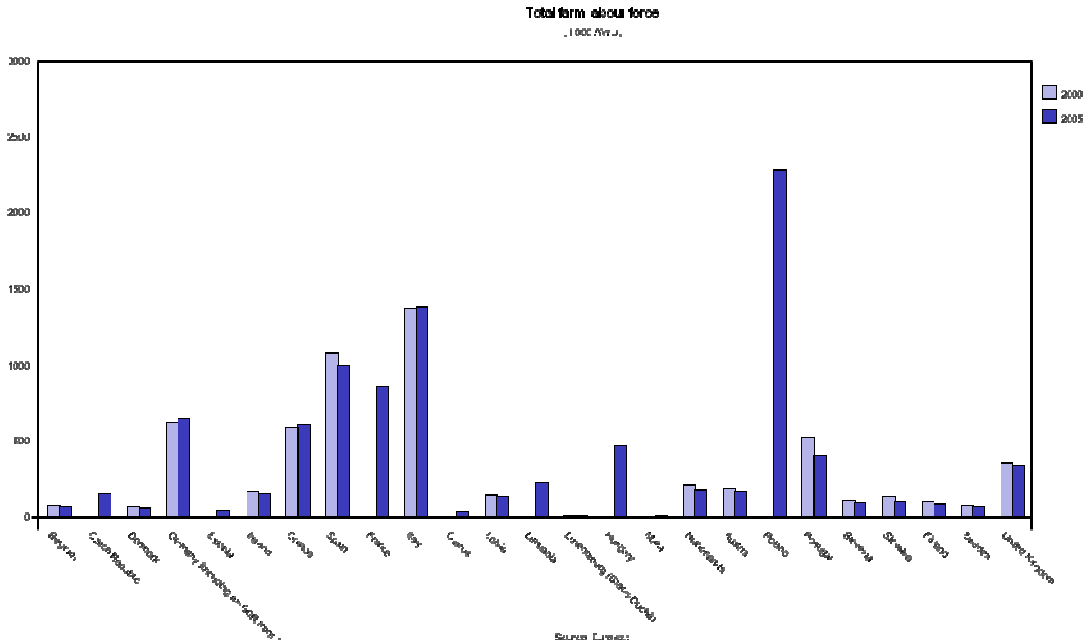
Country	1997	2003	2005	Variation 1997-2005	Country	1997	2003	2005	Variation 1997-2005
Poland	3,170.1	2,190.9	2,273.6	-28%	Austria	177.6	175.4	166.4	-6%
Italy	1,798.1	1,476.0	1,374.3	-24%	Latvia	175.2	140.9	137.3	-22%
Spain	1,099.0	997.8	992.6	-10%	Finland	125.7	97.5	83.5	-34%
France	1,079.9	913.8	855.5	-21%	Slovenia	114.3	95.4	95.0	-17%
Hungary	735.1	525.8	462.7	-37%	Denmark	97.9	60.7	58.4	-40%
Germany	656.8	688.8	643.2	-2%	Sweden	81.8	70.7	71.1	-13%
Greece	597.3	614.3	601.1	1%	Belgium	79.1	72.5	69.6	-12%
Portugal	519.8	455.2	398.1	-23%	Estonia	67.6	37.5	36.9	-45%
UK	416.0	352.2	336.3	-19%	Cyprus	40.0	32.2	28.7	-28%
Lithuania	310.3	222.1	221.6	-29%	Luxemburg	5.0	4.0	4.0	-20%
Netherlands	208.7	186.3	173.9	-17%	Malta	4.5	4.5	4.1	-9%
Ireland	202.3	160.0	152.4	-25%	EU15	7,145.0	6,325.2	5,980.4	-16%
Czech R.	192.8	166.4	151.9	-21%	EU10	4,999.5	3,534.3	3,510.6	-30%
Slovakia	189.6	118.6	98.8	-48%	EU25	12,144.5	9,859.5	9,491.0	-22%

Source: Eurostat

However agriculture remains socially important in some Member states (table 3.1). In 2003, more than 10% of labour force is employed in agriculture (including agriculture, forestry and fisheries) in Greece, Latvia, Lithuania, Austria, and Slovakia, and this rate is up to 20% in Poland (European Commission, 2006). Farm employment is concentrated in few Member-States (chart 3.1): in 2005 the top five countries (Poland, Italy, Spain, France and Hungary) accounted for nearly the two-third of the total EU labour force.

² These food names as the Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG)

Chart 3.1: Total farm labour force, by Member States, in 2000 and 2005



Source: Eurostat

The EU-25 accounts 397 millions of ha, 41% of them being agricultural land. Arable lands represent 24.4% of the total, permanent grasslands 14.2%, and permanent crops 2.9%. In 2004, production of agricultural goods in the EU-25 represented 308.1 billions of Euros, of which 176.3 billions of Euros came from crop production and 131.8 billions of Euros from animal products (Eurostat).

In 2005, five Member States (France, Italy, Spain, Germany and UK) accounted for 70% of the Gross Value Added of agriculture in EU-25 (table 3.2). Agricultural GVA is concentrated in the EU-15. Poland, the first EU-10 Member State in terms of GVA is only ranked eighth out of the EU-25, despite its large farm labour force. This indicates the lower levels of agricultural productivity in the EU-10 compared to the EU-15.

Table 3.2: Gross Value Added at basic prices of the agricultural industry in the EU-25, in million Euros

Country	1998	2001	2005	Share of total EU-25 in 2005	Country	1998	2001	2005	Share of total EU-25 in 2005
France	30,952	30,576	28,372	19.8%	Sweden	1,595	1,496	1,100	0.8%
Italy	28,432	28,070	26,329	18.4%	Finland	1,093	1,445	1,353	0.9%
Spain	23,084	25,022	24,910	17.4%	Czech R.	920	1,043	949	0.7%
Germany	15,221	19,918	12,810	9.0%	Lithuania	540	365	605	0.4%
UK	10,759	10,606	7,471	5.2%	Slovakia	483	440	450	0.3%
Netherlands	9,072	8,920	8,532	6.0%	Slovenia	465	397	485	0.3%
Greece	7,979	8,101	8,423	5.9%	Cyprus	315	365	330	0.2%
Poland	5,084	5,896	6,107	4.3%	Latvia	185	246	277	0.2%
Denmark	2,931	3,843	2,512	1.8%	Estonia	152	173	208	0.1%
Ireland	2,880	2,674	2,159	1.5%	Luxemburg	122	123	101	0.1%
Belgium	2,650	2,620	2,245	1.6%	Malta	66	71	57	0.0%
Austria	2,578	2,812	2,365	1.7%	EU25	151,816	159,974	143,095	100.0%
Portugal	2,206	2,680	2,559	1.8%	EU15	141,553	148,905	131,241	91.7%
Hungary	2,053	2,073	2,386	1.7%	EU10	10,263	11,069	11,854	8.3%

Source: Eurostat

Agricultural production in the EU-25 is relatively well-balanced among sub sectors. In 2004, crop products accounted for 57% of total production of agricultural goods, and animal products for 43%, both in the EU-10 and EU-15 (table 2.3).

Table 3.3: Value of agricultural production in EU-25, millions euros, in 2003

Country	Crop production	Animal production	Total	Country	Crop production	Animal production	Total
France	30,794	21,613	55,306	Sweden	1,740	2,152	4,013
Italy	25,030	13,772	40,157	Finland	1,385	1,664	3,175
Germany	16,811	18,100	36,302	Czech R.	1,370	1,444	2,856
Spain	22,292	13,361	36,116	Slovakia	603	732	1,379
Netherlands	10,473	7,290	19,555	Lithuania	683	473	1,166
UK	7,450	11,243	19,269	Slovenia	398	484	898
Poland	5,646	5,506	11,495	Latvia	246	204	456
Greece	5,993	2,488	8,481	Estonia	162	201	372
Denmark	2,596	4,411	7,374	Luxemburg	78	147	233
Belgium	3,076	3,280	6,401	Malta	42	69	111
Portugal	3,693	2,016	5,716	Cyprus	na	na	Na
Hungary	2,685	2,239	5,227	EU25	146,848	118,805	275,968
Ireland	1,321	3,552	5,117	EU15	135,013	107,453	252,008
Austria	2,281	2,364	4,793	EU10	11,835	11,352	23,960

Source: Eurostat

The EU-25 is one of the main world producers of cereals (except for rice and maize), of sugar, of some fruits and vegetables (potatoes for instance), of meats (beef, poultry and pigs) and of dairy products.

Cereals, vegetables and horticultural products, fruits, wine, cattle and pigs, account together for more than 50% of the total output of the agricultural industry in the EU-25 (see table 2.4 below).

Table 3.4: Share of world production for main EU agricultural products

	EU-25 Production (Millions of t)	% world production
Cereals (2004-2005)	283.8	17.4%
Pig meat (2004)	21.1	20.9%
Beef meat (2004)	8.0	12.9%
Poultry meat (2004)	9.7	12.6%
Fresh milk (2004)	142.3	27.6%
Potatoes	67.4	20.5%

Source : Cyclope, Les marchés mondiaux 2005

Within the EU-25, the food and drink industry is the largest manufacturing sector, accounting for 13.6% of total manufacturing sector³. Seventy percent of EU-25 agricultural production is processed by EU food and drink industries. The food and drink industry is the largest grouping in the manufacturing sector, ahead of automobile and chemical industries. Small and medium enterprises (defined as having fewer than 249 employees) dominate this sector (involving 99.1% of enterprises and 61.3% of labour force in this sector), but account for less than half of the value-added of food and drink industry. Food and drink businesses account for 13% of employment in the manufacturing sector which, as a whole, is the largest industrial sector in the EU-25, employing 3.8 millions employees. Sixty-five percent of employment is concentrated in 5 countries, including one new Member State, Poland.

Table 3.5: Employment in food and drink industry per Member State (in thousands of employees)

Country	Employment	Country	Employment
Germany	517.0	Austria	58.5
Spain	481.7	Ireland	46.0
Poland	464.3	Slovakia	39.1
UK	462.0	Finland	37.2
France	420.0	Latvia	35.3
Italy	258.0	Slovenia	18.1
Czech Republic	131.4	Estonia	16.7
Netherlands	130.3	Luxemburg	na
Hungary	113.4	Cyprus	na
Portugal	103.1	Lithuania	na
Belgium	90.4	Malta	na
Denmark	73.5	EU25	3622.5
Greece	67.8	EU15	2804.2
Sweden	58.7	EU10	818.3

Source : CIAA. Data for year 2005, except the Netherlands, Poland, Portugal and the UK (year 2004).

Within the food and drink industry sector, meat, dairy products and beverages account for 51% of total turnover and 42% of employment. A further 26% of total turnover and 42% of labour force is derived

³ 2005. Source: CIAA (Confederation of the food and drink industries of the EU)

from the “various products” category, which includes bakery, pastry, chocolate, sugar, pasta and baby food. The EU-25 is the world’s largest food and drink exporter (before the US and Brazil) and the world’s second largest importer (after the US and before Japan). The EU-25’s share of the world food and drinks market decreased slightly from 24% in 1997 to 20% in 2005.

2. Mercosur

The agricultural sector is a key component of Mercosur economies (table 2.6). In all Member States, agriculture accounts for more than 10% of GDP, following significant growth in recent years (see details for products below).

Table 3.6: Importance of the agricultural sector in Mercosur economies

	Argentina	Brazil	Paraguay	Uruguay
Agricultural share (%) of GDP (2004)	11.2	10.4	27.2	12.4
Growth (%) agricultural GDP (2004)	7	5.3	2.1	9
Agricultural population (% of total) 2003	9.4	14.8	38.9	10.8

Sources : World Bank, FAO.

Moreover, agriculture is a major source of employment in Mercosur countries, either directly (through primary production on farms) or indirectly (upstream and downstream activities). In 2003, the farm labour force in Argentina was 1.5 million people (9% of the total labour force), 0.75 million people in Paraguay (33% of the total labour force), 0.19 million people in Uruguay (12% of the total labour force) and 12 millions in Brazil (15% of the total labour force)⁴. A high proportion of the population on low incomes lives in rural areas and, as a result,, maintaining and developing agriculture plays a major role in social cohesion policy, with the level of farm incomes being a central issue.

Agriculture in Mercosur ranges between the two extremes of highly competitive and technologically developed commercial production systems, and at the other extreme, subsistence-based farming involving family labour and landless farmers. In Brazil, commercial agriculture represents 554,501 holdings occupying 240 millions hectares, and family farms constitute 85.5% of all agricultural holdings and 77% of the farm labour force. Family farming occupies 30.5% of land area and provides 37.9% of agricultural GDP. Unequal land distribution is an important social and economic issue in most of the Mercosur countries, and one of the main factors contributing to rural poverty. For instance, in Brazil, 12 million farmers are landless and 50,000 people use 44% of agricultural land. Despite this, land conversion to pasture for cattle continues to cause displacement of many landless farmers.

Mercosur is one of the worlds largest producers of crops and animals products, Argentina and Brazil dominating Mercosur production (see tables below). Moreover, production of most commodities in Mercosur is on an increasing trend.

Argentina is the main wheat producer and its production is relatively stable. Production in Brazil, the second largest Mercosur wheat producer, doubled since 1999, while production in Uruguay increased by 40% and in Paraguay by a factor of nearly 3.

Mercosur, excluding Venezuela, represents 8% of world maize supply, Brazil being the main producer. Brazil’s and Paraguay’s production has increased rapidly since 1999.

⁴ Source: FAO

Mercosur, excluding Venezuela, accounts for 39% of soya world production, and the region's production increased by 58% between 1999 and 2004. Argentina specialises in sunflower production, representing more than 10% of world production. However, since 1999, sunflower production in Argentina decreased substantially, from 7 millions tons to 3 millions, while soya production increased from 20 millions tons to more than 30 million.

Finally, Brazil is the world's largest sugar cane producer, accounting for 416 millions of tons, and has multiplied its production by three since 1999.

Table 3.7: Crops production in Mercosur (1999 – 2004), in thousands tons

Wheat						
	1999	2000	2001	2002	2003	2004
Argentina	15,478.66	16,146.62	15,427.82	12,300.00	14,530.00	14,560.00
Brazil	2,461.86	1,661.53	3,364.95	3,105.66	6,029.40	5,726.20
Paraguay	187.90	220.06	359.24	359.24	500.00	715.00
Uruguay	383.90	324.40	143.60	205.80	326.00	532.60
World	587,661.32	586,059.62	590,026.60	575,085.26	560,886.66	632,594.72
Maize						
	1999	2000	2001	2002	2003	2004
Argentina	13,504.10	16,781.40	15,365.05	15,000.00	15,040.00	15,000.00
Brazil	32,037.62	31,879.39	41,955.26	35,932.96	47,988.00	41,806.00
Paraguay	817.23	647.27	947.17	867.27	1,055.54	1,120.00
Uruguay	242.50	64.70	262.83	163.40	178.50	223.00
World	607,643.42	592,790.11	614,984.51	604,249.07	644,219.20	724,589.00
Soybeans						
	1999	2000	2001	2002	2003	2004
Argentina	20,000.00	20,200.00	26,864.00	30,180.00	34,800.00	31,500.00
Brazil	30,987.48	32,734.96	39,058.00	42,769.00	52,018.00	49,793.00
Paraguay	3,053.01	2,980.06	3,511.05	3,300.00	4,204.86	3,583.68
Uruguay	19.00	6.80	27.60	66.70	183.00	377.00
World	157,801.00	161,404.95	176,761.13	180,907.13	188,934.83	216 000
Sunflower seed						
	1999	2000	2001	2002	2003	2004
Argentina	7,125.14	6,069.65	3,043.00	3,843.00	3,714.00	3,100.00
Brazil	79.00	148.00	158.00	150.00	168.00	200.00
Paraguay	72.54	81.95	39.86	36.01	31.00	44.55
Uruguay	160.70	33.30	58.20	150.30	234.00	177.00
World	29,090.87	26,382.86	20,311.12	24,485.84	27,726.29	29 660
Sugar Cane (raw equivalent sugar)						
	1999	2000	2001	2002	2003	
Argentina	1,886.98	1,827.76	1,884.52	1,935.77	2,217.67	
Brazil	21,143.69	17,480.68	20,778.88	24,041.42	26,777.20	
Paraguay	151.00	135.00	149.00	170.00	170.00	
Uruguay	8.92	8.80	8.53	8.99	8.99	
World	168,472.11	166,706.07	166,582.84	179,126.90	182,709.41	

Source: FAOSTAT

Accounting for more than 10 millions tons of bovine meat, Mercosur produces almost 20% of world beef meat production. Brazil is the main supplier (Brazilian production is double that of Argentina). Production increased by almost 10% from 1999 to 2004 in Brazil, Uruguay and Argentina, while it decreased for Paraguay.

Chicken meat production is increasing in Brazil too, although in other Mercosur Member States chicken production has remained stable. Brazilian chicken meat production increased by almost 20% from 1999 to 2004, and accounted for 13% of world production in 2004. In contrast, pig production is weakly developed in Mercosur, accounting only for 3% of world production. However, pig meat

production in Brazil, which has the highest production of the Mercosur states, grew by 30% between 1999 and 2004.

Last, dairy production is also increasing in Brazil, from almost 20 millions tons to 23 millions between 1999 and 2004. In the same period, dairy production decreased in Argentina and Paraguay while it remained quite stable in Uruguay.

Table 3.8: Processed animal products in Mercosur (1999 – 2004), in thousands tons

Bovine meat						
	1999	2000	2001	2002	2003	2004
Argentina	2,719.78	2,718.00	2,461.00	2,493.00	2,621.00	3,024.00
Brazil	6,413.30	6,578.80	6,823.60	7,139.30	7,230.50	7,774.00
Paraguay	246.00	238.62	200.00	205.00	215.00	215.00
Uruguay	457.70	453.12	317.00	411.84	424.21	496.50
World	56,351.9	56,950.61	56,147.72	57,816.92	58,512.25	59,713.83

Pig meat						
	1999	2000	2001	2002	2003	2004
Argentina	214.58	213.97	197.50	165.29	149.76	150.20
Brazil	2,400.00	2,600.00	2,637.00	2,798.00	3,059.00	3,110.00
Paraguay	120.00	114.00	102.60	78.00	84.00	156.00
Uruguay	27.00	26.00	22.60	19.52	16.80	15.25

Chicken meat					
	1999	2000	2001	2002	2003
Argentina	982.86	1,000.26	993.12	742.31	781.36
Brazil	5,646.80	6,124.75	6,380.15	7,239.21	7,967.41
Paraguay	41.63	34.64	37.78	36.71	38.74
Uruguay	57.66	52.66	53.20	53.70	54.21
World	65,217.57	68,982.38	71,733.65	74,581.87	76,285.54

Milk, whole, fresh						
	1999	2000	2001	2002	2003	2004
Argentina	10,649.20	10,121.33	9,768.73	8,793.40	8,197.48	8,100.00
Brazil	19,802.22	20,526.99	21,283.80	22,452.70	23,450.00	23,455.00
Paraguay	445.00	329.80	331.00	375.13	380.00	362.04
Uruguay	1,479.38	1,421.75	1,495.00	1,490.00	1,495.00	1,641.00
World	569,274.28	578,686.52	588,876.19	602,229.23	614,530.77	523 000

Source: FAOSTAT

This short overview shows that agricultural production in Mercosur increased rapidly with increases of between 58% (soy beans) and 4% (milk) and a decline of 53% for sunflower seeds from 1999 to 2004. For soy bean, sunflower, beef and chicken meat and sugar cane Mercosur accounts for a large part of world production and exports. Within the region, Brazil is the most dynamic and important country. Argentina plays an important role for beef and soya beans. Paraguay's small size produces relatively low agricultural production but it has experienced significant increases in sugarcane and soybean production. Uruguay is less agriculturally developed but has seen strong growth in soya bean production.

IV. TRADE FLOWS

1. EU/Mercosur trade overview

Food and agricultural raw materials represent more than 50% of Mercosur exports to the EU (table 4.1). While the EU is a key consumer of Mercosur exports, Mercosur is not a main destination for European food and agricultural exports. Mercosur is one of the main suppliers to the EU for food products (accounting for 20% of EU agricultural and food imports⁵), but represents less than 3% of EU exports.

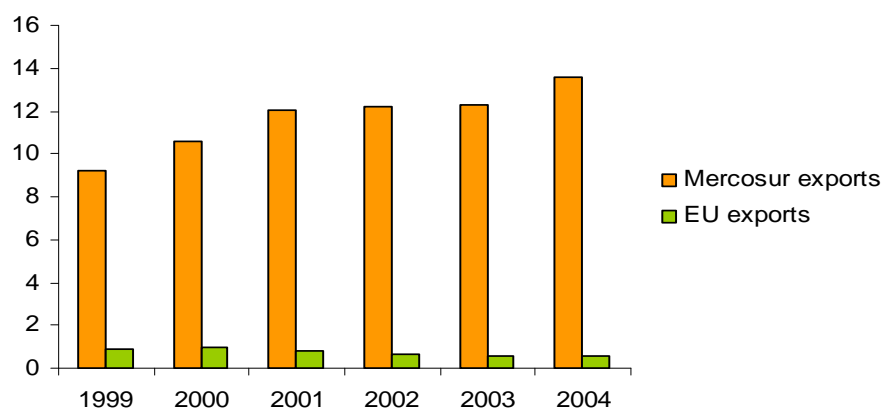
Table 4.1: Trade flows in goods and in food and agricultural products between the EU, the world and Mercosur, in billions of Euros (2004)

EU TRADE IN GOODS		
Trading partner	Imports	Exports
World	1,050	1,004
Mercosur	28	18
EU TRADE IN FOOD AND AGRICULTURAL PRODUCTS		
Trading partner	Imports	Exports
World	61	57
Mercosur	14	0.6

Source: COMEXT database

Moreover, Mercosur exports to the EU are on an increasing trend, whereas EU exports to Mercosur decline (chart 4.1).

Chart 4.1: EU-Mercosur agricultural trade, in millions of Euros



Source: COMEXT database

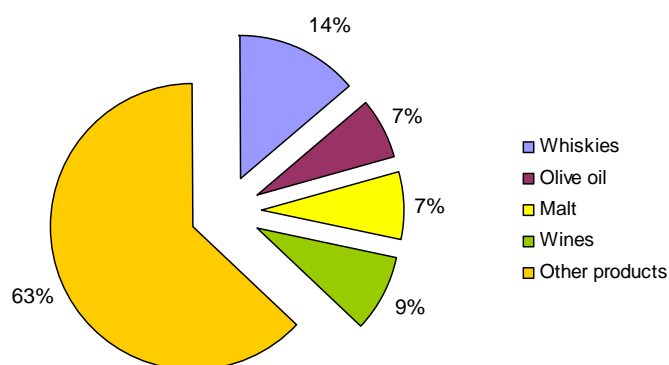
The levels of intra-regional trade in food and agricultural products differ markedly between the EU and Mercosur. Most of EU trade is intra-EU, whereas intra-Mercosur trade represented only 10% of Mercosur exports (and this share decreases) (Chelem database).

⁵ 13 billions of Euros on a total of 61 billions

2. EU exports to Mercosur

Significant products exported from the EU to Mercosur are whiskies (14% of exports by value over the period 1999-2004), wines (9%), olive oil (7%) and malt (7%). (Chart 4.2).

Chart 4.2: Share of EU food and agricultural exports to Mercosur, in worth (average 1999-2004)



Source: COMEXT Database

With the exception of malt, EU exports of these products to Mercosur have been in overall decline since 1999 (Table 4.2).

Table 4.2: Main exports from EU to Mercosur (measured in thousands of Euros)

	1999	2000	2001	2002	2003	2004
Whiskies	144,206	128,055	117,407	76,152	79,180	79,672
Olive oil	45,845	64,974	56,721	47,654	43,802	57,069
Malt	29,304	43,029	81,262	58,704	69,324	52,742
Wines	83,539	87,921	72,354	47,963	48,871	48,267

Source: COMEXT database

3. Mercosur agro-food exports to the EU

Food and agricultural commodities account for more than 30% of Mercosur exports, and represent more than 50% of Mercosur exports to the EU.

Table 4.3: Composition of Mercosur exports (%)

	Food			Agricultural Commodities		
	95	00	02	95	00	02
World	35.5	30.5	33.9	5.2	3.9	3.3
LAC	24.3	19.5	19.2	2.9	1.7	1.6
USA	16.3	11.6	9.9	5.6	4.4	3.7
EU-15	51.4	46.5	51.7	8.0	6.4	4.9
ASIA	34.3	36.5	40.1	7.6	7.5	6.1

Source : IADB (2004)

To the EU, Mercosur agricultural (food industry in the chart) exports are concentrated on a small number of products. Table 4.3 shows the percentage of each main product among the total exports

from Mercosur to the EU. The main export products (soya and coffee) have free access to the EU market. The share of each does not reflect the potentialities of Mercosur production to be exported to the EU, but a mix between potentialities and the level of EU protection, which is very high for some products (see section on trade measures).

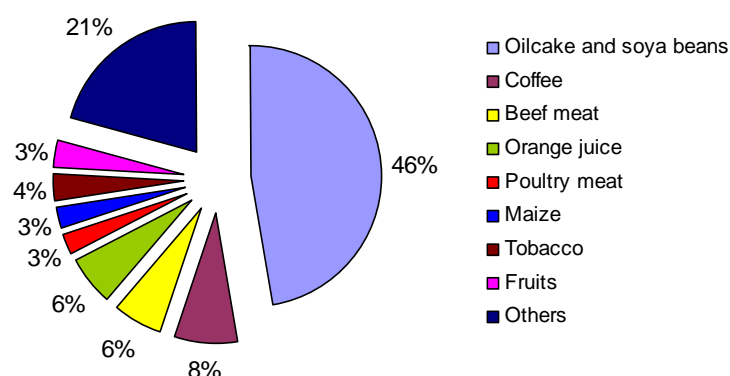
Table 4.4: Share of Mercosur main products in exports towards the EU (% of worth)

	1999	2000	2001	2002	2003	2004
Oilcake from soya bean	23.52	28.40	30.15	29.88	28.99	32.23
Soya bean	15.45	15.20	20.40	19.36	19.84	19.25
Coffee	11.35	9.92	7.44	6.41	5.95	5.94
Fresh or chilled meat of bovine animals	3.80	3.88	2.06	3.50	3.86	4.50
Orange juice	0.35	0.44	2.17	5.38	5.21	4.26
Maize	2.54	2.79	2.45	1.92	3.25	3.18
Frozen meat of bovine animals	3.02	2.79	2.16	2.38	2.04	2.43
Raw tobacco	3.89	4.04	3.46	3.39	3.43	2.96
Preparations of poultry meat	0.65	0.97	1.30	1.24	1.71	1.94
Poultry meat	1.11	1.11	1.23	1.04	1.66	1.92
Preparations of bovine meat	2.38	2.00	1.70	1.68	1.42	1.65
Apples	1.01	0.77	0.84	0.90	1.08	1.14
Lemons and limes	0.94	0.80	0.86	0.86	1.19	1.00
Pears	0.89	0.86	0.79	0.86	0.82	0.69
Oranges	0.81	0.41	0.96	0.38	0.55	0.60
Frozen orange juice	7.98	7.26	3.02	0.32	0.07	0.07

Source: COMEXT database

Soya bean products dominate Mercosur exports to the EU (chart 4.3).

Chart 4.3: Share of Mercosur food and agricultural exports to the EU, in worth (average 1999-2004)



Source: COMEXT Database

The share of exports is not equal amongst all Mercosur countries. The following sections detail the origin of selected products.

Soya bean and soya bean oilcake

Soya bean and soya bean oilcake represent the two main products exported by Mercosur countries among which Brazil and Argentina are the principal suppliers. Table 3.5 and 3.6 show that the share shipped to Europe and measured in thousands of euros steadily increased between 1999 and 2004.

Table 4.5: EU Imports from Mercosur for oilcake from Soya bean (measured in thousands of Euros)

	1999	2000	2001	2002	2003	2004
Brazil	985 303	1 447 143	1 917 075	1 768 044	1 711 552	2 178 188
Argentina	1 176 638	1 553 488	1 712 768	1 871 819	1 839 358	2 184 594
Mercosur	2 162 074	3 002 821	3 630 476	3 640 026	3 564 503	4 363 450

Source: COMEXT database

Table 4.6: EU Imports from Mercosur for Soya bean (measured in thousands of Euros)

	1999	2000	2001	2002	2003	2004
Brazil	1 111 547	1 428 676	2 149 134	2 015 775	2 124 918	2 242 955
Paraguay	132 733	90 917	146 179	56 755	193 601	232 486
Argentina	172 228	87 640	157 029	261 114	70 638	45 856
Mercosur	1 420 436	1 607 524	2 456 412	2 358 505	2 439 383	2 605 947

Source: COMEXT database

Bovine and poultry meat

Brazil and Argentina are the main exporters of bovine and poultry meat export, accounting for more than 1.6 billion Euros in 2004. Meat exports have increased significantly between 1999 and 2004, particularly for poultry meat and its preparation.

Table 4.7: Main meat EU imports from Mercosur (measured in thousands of Euros)

	1999	2000	2001	2002	2003	2004	Variation (1999-2004) (%)
Fresh or chilled meat of bovine animals	349 740	410 200	248 452	425 871	474 792	609 040	74
Frozen meat of bovine animals	277 899	294 651	259 506	290 434	251 342	329 513	19
Preparations of bovine meat	219 225	211 841	205 022	204 716	174 621	223 061	2
Poultry meat	101 893	117 739	147 874	127 044	203 514	260 420	156
Preparations of poultry meat	59 623	102 695	156 508	150 518	209 775	262 703	341
Total	1 008 380	1 137 126	1 017 362	1 198 583	1 314 044	1 684 737	67

Source: COMEXT database

Fruits and juices

Brazil is the main exporter for oranges and orange juice; Argentina for lemons and pears. Apple exports are split between the two countries. Apple exports have increased by 66% between 1999 and 2004.

Table 4.8: Main EU imports for fruits and juices from Mercosur (measured in thousands of Euros)

	1999	2000	2001	2002	2003	2004
Apples	93 033	81 095	101 646	109 106	132 480	154 003
Pears	81 932	90 526	95 717	104 422	101 174	93 790
Oranges	74 017	43 821	115 563	46 811	67 406	81 279
Lemons and limes	86 214	84 408	103 673	105 356	146 807	135 472
Frozen orange juice	733 237	767 419	363 230	39 415	9 222	9 203
Orange juice	31 820	46 565	260 817	654 883	640 788	576 556

Source: COMEXT database

Other products

Brazil is an export leader for both coffee (accounting for more than 99% of Mercosur production) and tobacco (varying between 80% and 90%). Maize exports are split between Argentina and Brazil (in 2004).

Table 4.9: Other exports from Mercosur to the EU (measured in thousands of Euros)

	1999	2000	2001	2002	2003	2004
Raw tobacco	357 928	427 105	416 974	413 240	422 067	400 176
Coffee ¹	1 043 262	1 049 056	896 313	780 776	731 307	803 838
Maize ²	233 283	295 354	294 657	233 850	399 100	430 242

Source: COMEXT database

Notes: 1: Coffee excluding decaffeinated and roasted; 2: Maize excluding seed

V. TRADE MEASURES

1. EU

Tariffs

Many products exported by Mercosur countries such as soya bean, soya bean oilcake or any kind of ‘tropical’ products (coffee, cocoa, mangoes) are subject to few or no tariffs when entering the European market.

However, whenever other Mercosur exports are in competition with European production, market access is restricted by import tariffs, entry prices and seasonal tariff rates (limited to certain fruits and vegetables and preparations thereof).

A small selection of products and tariffs can be seen in Tables 5.1-5.6.

Table 5.1: Sugar & Ethanol

Products	In quota tariffs	Off-quota tariffs	Representative price	Additional duty
Raw cane sugar for refining	98 €/ton	339 €/ton	307.4 €/ton	+ 20.6€/ton
Raw cane sugar, other	Not applied	419 €/ton	307.4 €/ton	+ 61.6 €/ton
White sugar	Not applied	419 €/ton	381 €/ton	+ 29.1€/ton
Ethanol, denaturated	Not applied	102 €/m ³	Not applied	Not applied
Ethanol, undenaturated	Not applied	192 €/m ³	Not applied	Not applied

Source: EC website: Export Helpdesk, European Commission

Notes: Additional duties (special safeguard clause for the CMO) are applied when the representative price falls below the ‘trigger’ price (set at 531 € per tonne for white sugar, 418 for raw sugar for refining and 552 for raw sugar not for refining). The representative price is the cif import price excluding the fixed duty. It is close to the world price and therefore well below the ‘trigger’ price. Consequently, the safeguard clause has been applied permanently since 1995. (source: European Commission)

Table 5.2: Bovine meat tariffs

Products	In-quota tariffs	Off-quota tariffs
Fresh or chilled, boneless	20%	12.8% + 3034 €/ton
Fresh or chilled, carcasses		12.8% + 1768 €/ton
Frozen, boneless		12.8% + 2211 €/ton
Frozen, carcasses		12.8% + 1768 €/ton

Source: EC website: Export Helpdesk, European Commission

In-quota tariffs, so-called “Hilton quota”, provides a market access with 20% duty for the following quantities; Brazil 5000T, Uruguay 6300T, Argentina 28000T, Paraguay 1000T (Commission Regulation (EC) No 936/97 of 27 May 1997).

Table 5.3: Chicken meat tariffs

Product	In-quota tariffs	Off-quota tariffs
Chicken cuts frozen and boneless	795 €/ton	1024 €/ton
Chicken cuts fresh or chilled and boneless	512 €/ton	1024 €/ton

Source: EC website: Export Helpdesk, European Commission

Note: safeguard measures may apply resulting in additional duties.

Table 5.4: Apple tariffs

Products	Country	Off-Quota		In-Quota		
		Standard import value	Entry prices	Total quota volume available	Ad valorem duty	Entry prices
Apples, other	Brazil	928 €/ton	From 0% to 6.4 % + 11€ to 23.8€ per ton	600 t	0%	From 11€ to 238€ per ton
	Argentina	765 €/ton				
	Paraguay	1002 €/ton				
	Uruguay	1002 €/ton				
Apples in bulk (September 16 th to December 15 th)	Mercosur	No restrictions		Not applied		

Source: EC website: Export Helpdesk, European Commission

Notes: entry prices vary according to the time of the year. Standard import values are regularly fixed according to market information. Data was retrieved at the end of June 2006

Table 5.5: Pear tariffs

	Standard import value	Entry prices
Pears ¹ (between May 1 st and June 30 th)	None	Not Applied, 2.5%
Pears ¹ (between July 1 st and April 30 th)	From 0 to 667 €/ton	From 0% to 10.4% + 10 to 238€/ton

Source: EC website: Export Helpdesk

Notes: 1: NTC code 08082050. Entry prices vary according to time of the year and standard import values are regularly fixed according to market information; Pears between May 1st and June 30th benefit from a 3.5 % point duty reduction under the generalised preferences scheme (GSP)

Table 5.6: Wheat tariffs

Product	In-quota tariff	Off-quota tariff
Medium and low quality common wheat and spelt	12€/tn	95€/ton

Source: EC website: Export Helpdesk

Non tariffs measures

To enter to the EU market, Mercosur products have to comply with EU requirements, primarily focusing on SPS aspects and concerned with ensuring a high level of security for EU public, animal and plant health and environment. The main EU regulations relevant for food imports are presented and summarised in Table 5.7.

Table 5.7: Main EU regulations on food products

Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community	Organisms harmful to plants or plant products= insects and mites, bacteria, fungi, viruses and parasite plants. This Directive subjects certain plants and plant products from other countries to a check on entry into EU territory. This involves a documentary check, an identity check and a plant-health check.
Regulation 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in products of plant and animal origin.	The Regulation establishes the maximum quantities of pesticide residues permitted in products of animal or vegetable origin that are intended for human or animal consumption. These maximum residue levels (MRLs) * include, on the one hand, MRLs that are specific to particular foodstuffs that are intended for human or animal consumption and, on the other, a general limit that applies where no specific MRL has been set
Commission Directive 2002/63/EC of 11 July 2002 establishing Community methods of sampling for the official control of pesticide residues in and on products of plant and animal origin	Set the analyzing process
Regulation 178/2002 of the European Parliament and of the Council of 28 January 2002 on food safety, which establishes traceability for food products	Traceability was defined as the ability to identify a unique product, and the raw materials used in its production, and to follow the progress of that product right through the production and distribution process. Operators in the food sector are now required to have product withdrawal systems as well as records identifying the source of their raw material and the businesses they supply.

EU agricultural policy

The Common Agricultural Policy (CAP) was established following the Treaty of Rome in 1957. At the beginning, the CAP aimed to increase agricultural production in view to ensure food self-sufficiency. Main instruments were guaranteed prices, variable levels of border duties and export subsidies. The CAP was successful, and production increased quickly, leading to surpluses in many agricultural commodities from the middle of the 1970s. In 1992, the process of CAP reform started, shifting support from guaranteed prices to direct aids to farmers. This process has continued, with further changes in 2000 and 2006 involving increasing cuts in guaranteed prices, import tariffs and export subsidies and the introduction of ‘decoupled’ support to farmers (‘decoupled’ in the sense that it is not conditional on levels of agricultural production). The reforms have gradually encompassed all the major agricultural commodities from cereals and beef at first, then dairy production and finally sugar production (in 2006).

The cuts in expenditure on export subsidies and volumes of subsidised exports have been dictated by the EU’s commitments under WTO trade agreements. Since the implementation of both CAP reform and WTO agreement on agriculture, EU share of world markets of wheat, beef meat, poultry meat, sugar and milk powder has decreased, allowing more competitive exporters (among them Brazil and Argentina depending on products) to export more on the world market (Alpha et al, 2006).

2. Mercosur

Tariffs

The implementation of the Mercosur Common external tariff has led to a decrease of upper tariff levels. Currently, no Mercosur tariff applied on agricultural products theoretically exceeds 20%, but individual Mercosur countries may apply lower or higher tariffs in derogation from the Mercosur common external tariff under certain conditions. Bound tariffs of Mercosur member states under the WTO framework may exceed this rate for some products. Whiskies and wines, EU’s main exports

towards Mercosur, are both subject to the rate of 20%. Olive oil (except exports to Argentina which are subject to a 31.5% import duty) and malt benefit from lower tariffs.

Table 5.8: Tariffs for main EU exports

Products	Tariff
Whiskies	20 %
Wine	20%
Olive oil	10% (except Argentina, 31.5%)
Malt	10%

Source: Mercosur website

Non tariff measures

EU exports need also to comply with Mercosur regulations. Mercosur countries also apply some SPS trade restrictions, in particular as regards movement of live bovine animals, beef, pig meat and poultry. In order to preserve the identity of Mercosur countries' wine and wine products, sale of wine in containers exceeding five-litre capacity is prohibited in Argentina and Paraguay. The limit is up to one-litre capacity in Uruguay, and sixteen-litre capacity in Brazil. (MERCOSUR/GMC/RES.n°12/02)

Argentina

Automatic licenses are applied for imports of agricultural and food products from chapters 01, 02, 04, 07, 11, 13, 16, 17 and 20 of the harmonised system. Importing foodstuffs for human consumption requires prior authorization.

Brazil

Some products are subject to non-automatic licensing, among them live animals and meat products, vegetable products, fats and oils and prepared food.

Paraguay

Prior authorisations are requested to import food products to Paraguay, for health purposes. Specific labelling requirements are applied to malt beer, grape and wine growing products.

Uruguay

Whisky imports are submitted to special custom transit regime, including the use of a special form and a deposit of 140% of the custom value. Automatic import licensing is used for price control purposes, for some products such as edible oils or refined sugar. Imported wine of superior quality and appellation of recognised origin have to comply with specific technical regulations.

Mercosur agricultural policy

At the Mercosur level, there is no pan-regional agricultural policy, nor are there plans to develop one. The establishment of regional sectoral policies has not been an objective of Member States and Mercosur remains a custom union with no willingness for an in-depth integration process towards full economic union (according to Hugon's classification, in Hugon 2003). Each Member State thus has its own national agricultural policies, summarised below. Information comes from the WTO Secretariat report for Trade policy reviews. For Mercosur countries, trade policy reviews are recent, being achieved in January 2007 for Argentina, November 2004 for Brazil, April 2005 for Paraguay and May 2006 for Uruguay.

All four Mercosur Member States have national laws that define the geographical origins (provenance) of products, allowing them to be marketed with 'geographical indications'.

Argentina

Most of Argentinean domestic support is classified in green box measures, according to the WTO Agreement on Agriculture. Nevertheless, some of them report to Amber box. Global Aggregated Measure of Support (AMS) represents Arg\$ 75 millions, including a product specific AMS for tobacco which consist in minimum prices.

In order to stabilise domestic prices, which may increase partly due to the external demand, export prohibition may be applied on bovine livestock and of certain cuts of beef meat. Hilton beef meat exported to the EU under the tariff quota is not submitted to export prohibition. From March 2006 to April 2006, the Argentinean Government banned beef meat exports to stabilise domestic supply and prices, and in May 2006 it turned the ban into quantitative restrictions. For some products, such as wheat, an agreement was reached whereby exporters restrain their foreign sales, to avoid increase of domestic prices.

Brazil

In agriculture, minimum prices are sustained, and rural credit has preferential rate. Marketing programs and sustaining and stabilising prices based on market forces exist also. Most of those programs are targeting small holders. The national food supply company, CONAB, is a state-owned company responsible of market intervention (minimum price but often lower than world market price). PRONAF is a program aiming to strengthen familial agriculture. It provides credit at preferential rate, education and technical assistance. Credit can be used to launch new production or to refinance a debt. PEP is a program to sustain products marketing. It subsidises buyers if minimum price is higher than market price. Buying option are also sold by CONAB. Growers can buy such options (for rice, maize, sorghum, wheat and coffee) and sell their product at the option term or sell to the market if price is higher. FUNCAFE is a special program to sustain coffee sector, providing credit, financing research and sustaining prices. Insurance can also provided by the Government. Brazil uses no export subsidies. AMS remains under the *de minimis* threshold.

Export incentives non-specific to agriculture are provided by the Brazilian Government. The drawback system provides for the suspension, exemption or restitution of import taxes when imported goods are used to produce exportable goods. Export credits are provided under the PROEX and the BNDES-EXIM programme.

Paraguay

In agriculture, there is little government intervention. All measures are classified in the green box, and there is no AMS used, according to the WTO trade policy review.

In order to promote local processing, an export tax of 4% was introduced in 2004. The resources generated by this export tax are used to fund rural development projects (poverty alleviation, health, education, productivity enhancement).

Uruguay

Most of domestic supports provided by Uruguay to agriculture have to be considered as green box measures. AMS remains under the *de minimis* threshold. There is a fund for conversion of sugar sector to other crops (rice, vegetables, fruits, wine grape). Product specific AMS are used for fruit trees, citrus trees and winegrowing. Administrative prices are applied to pasteurised milk for human consumption, and to traditional varieties of grape for making wines. Because traditional varieties represent only 5% of total grape production, administrative price was extended in 2005 to Hamburg Muscat grape, which represents 20% of total grape production in Uruguay.

VI. FIRST RESULTS OF THE IMPACT ASSESSMENT OF THE LIBERALISATION SCENARIO

1. The modelling

Output

The Copenhagen Economics Trade Model (CETM) aggregates agricultural production into four product groups as shown in Table 6.1.

Table 6.1. Product aggregation used in the economic model

Sector	GTAP sector	Corresponding ISIC/CPC codes
Grains	Paddy rice; Wheat; Cereal grains nec.	CPC 0111-0116, 0119
Crops	Vegetables, fruit, nuts; Oil seeds; Sugar cane, sugar beet; Plant-based fibers; Crops nec	CPC 012-017, 019
Animal Products	Bovine cattle, sheep and goats, horses; Animal products nec; Raw milk	CPC 0211-0212, 0291-0295, 0297-0299
Processed Foods	Bovine meat products; Meat products nec; Vegetable oils and fats; Dairy products; Processed rice; Sugar; Food products nec; Beverages and tobacco products	CPC 2111-2114, 216-218, 22-25

The results of the modelling indicate that liberalisation would globally increase agricultural and food output in the Mercosur region, while output would decrease in the EU (table 6.2). The estimates are for full liberalisation. Lesser degrees of liberalisation, including the introduction or revision of tariff rate quotas, would have smaller effects in the same direction.

Table 6.2: Changes in agriculture and processed output, perfect competition model, full liberalisation. Result of the CETM (percentage changes).

	Argentina	Brazil	Paraguay	Uruguay	EU15	EU10
Grains	11.3	15.1	10.8	8.6	-4.4	-1.5
Crops	1.7	0.4	-7.8	1.2	0.2	-0.4
Animal Products	4.1	31.9	36.6	4.6	-3.5	-1.0
Processed foods	6.1	46.6	72.9	17.1	-5.1	-2.7

Source: CETM

Within the EU, the EU 15 will be relatively the most affected by liberalization of agriculture and food products. The projected output decrease for full liberalisation is highest for food products (-5.1% for the EU15 and -2.7% for the EU10). Grains output is projected to decrease in the EU 15 by 4.4% and in the EU 10 by 1.5%. The effects for animal products are estimated as -3.5 % (EU15) and -1% (EU10). It should be noted that in the EU, a high proportion of grains, are fed to cattle. This is less the case in Mercosur where grass and grass forage currently form a higher proportion of beef cattle diets. An increase in animal product imports to the EU, and a corresponding fall in domestic livestock production, will therefore see a significant fall in EU demand for grains fed to livestock. This is likely to account for the projected decrease of grains output in the EU, as well as an increase of wheat imports from Mercosur.

The consequences on crops estimated by the model are different: the EU15 output is projected to increase slightly (by 0.2%) and decrease for the EU10 by 0.4%. The main EU exports to Mercosur,

wines, spirits, malt and olive oil, are produced from crops in this category. This result tends to indicate that expansion of those products will compensate a cut in sugar beet production.

Mercosur agriculture and food output are expected to increase through liberalization. The model indicates that production in Brazil and Paraguay would increase particularly for animal products, with respectively 31.9% and 36.6% for full liberalization. Food products would develop strongly in Paraguay (72.9%) and Brazil (46.6%), while Uruguay would increase its food products output by 17.1%. Grains would develop more equally in the four countries, although the increase in Brazil is projected to be twice that in Uruguay (respectively 15.1% and 8.6%). It should be noted that any significant rise in chicken production in the Mercosur states would increase demand for grains, particularly wheat, in these countries. Changes in output for crops are projected to be less than 2% for Brazil, Argentina and Uruguay, and even negative (-7.8%) for Paraguay. These modelling results are surprising, as sugar is in this category, and Brazilian sugar could be expected to develop after liberalisation through better access to the EU market.

Export quantity

The results of the modelling for export quantities indicate that Mercosur countries would increase their exports of food products to the EU, with a high percentage of growth (table 6.3). EU exports would fall in the EU10, with limited gains for EU15 exports.

The modelling results for animal products, which indicate a decrease in exports of living animals and raw milk from Mercosur to the EU, need to be treated with caution: animal products, under the definition of GTAP database, are only traded in a very limited way, and so exports are small and are strongly dependent on factors, such as sanitary measures, other than tariffs.

The main finding from the model is that Mercosur would expand exports of food products, which suggests that the food processing industry (at first level or more elaborated level) would develop, in order to benefit from a better access to the EU market. Probably, the meat industry would be one of the increasing sectors, due to the fact that animal products output is likely to increase. The changes for less than full liberalisation would be less than those shown in Table 6.3, but the increase is nonetheless expected to be significant. Within Mercosur countries, Paraguay would benefit the most from expansion of food products exports, followed by Brazil and Uruguay, Argentina.

Table 6.3: Change in Export Quantity, full liberalisation. Result of the CETM (percentage change)

	Argentina	Brazil	Paraguay	Uruguay	EU15	EU10
Grains	15.8	-26.1	-22.7	25.9	-2.8	-0.2
Crops	0.8	-33.2	-36.1	-3.6	1.2	1.0
Animal Products	-17.3	-54.9	-75.5	-35.7	2.1	-2.3
Processed foods	40.5	339.9	608.7	131.2	0.5	-5.3

Source: CETM

Employment

Employment will follow the same trend as output. For full liberalisation the model projects a considerable increase in animal products in Brazil (37.5%) and Paraguay (43%). This is likely to occur mainly in poultry farming and cattle breeding. Employment in the grains sector is estimated to grow up to 10% to 20% for full liberalisation, varying between countries. This may be the result of increasing wheat production for export to the EU, and increasing maize production for animal feeding (a spill over effect from increasing production of animal products). Employment in the food industry, here under the category of food products, will increase mainly in Brazil and Paraguay, clearly linked to the expansion of food products output and exports.

For the EU side, employment in agricultural and food sector follows an opposite trend. Employment is likely to decrease in all agricultural sectors, and more in EU-15 than EU-10. Contraction of employment is seen in the grains sector. Employment in animal products is likely to fall as a result of increase meat imports from Mercosur. The expansion of food products imports from Mercosur will logically generate a contraction of food processing within the EU, leading to a reduction of employment in food products sector (more in EU-15 than in EU-10, due to the fact that food industry is more developed in old member states).

Table 6.4: Employment Effects, full liberalisation. Result of the CETM (% change)

	Argentina	Brazil	Paraguay	Uruguay	EU15	EU10
Grains	14.2	19.1	14.2	11.1	-4.8	-1.9
Crops	3.6	3.3	-6.1	3.0	-0.1	-0.7
Animal Products	6.3	37.6	43.3	6.7	-3.9	-1.4
Processed foods	5.9	47.4	76.7	17.1	-5.2	-2.6

Source: CETM

2. Case study findings

Following consultation on the inception report for the SIA study, two agricultural products were selected for detailed examination because of their potentially significant sustainability impacts: ethanol and beef. Ethanol is of particular interest because of its contribution to replacing fossil fuels in response to climate change, and the potential for increased EU imports from Mercosur through the trade agreement. Beef is a major export product of Mercosur countries, whose production has potentially significant environmental and social effects.

Both case studies are presented in full in Annexes 1 and 2. The main findings are summarised below in terms of the contributions made by these two sectors to the overall impacts of liberalising EU-Mercosur agricultural trade.

Ethanol case study

Economic impact

A significant increase in exports of ethanol from Mercosur to the EU is expected to occur as a result of the proposed trade agreement. Much of this will contribute to satisfying growing EU demand. However, the reduction of EU tariffs may be sufficient to reduce the price of Mercosur ethanol below the cost of EU production. This could result in a significant decline in EU ethanol production.

Social impact

Mixed social effects are expected in Mercosur, particularly in Brazil, varying between the short term and the longer term. In the short term a rise in employment in the sector is expected, with some improvement in wages and working conditions in order to attract workers. However, an increase in labour costs may increase incentives for mechanisation, resulting in higher skill levels in the longer term, and lower employment. Current labour productivity is low, with a considerable increase available from mechanisation. Employment in the sector may therefore decline in the longer term, despite increased production, but with higher wages and better conditions.

The increase in production will call for an increase in land area, which is expected to come from small farms producing other crops. This may result in a loss of livelihoods for small scale farmers. Brazilian government policy already includes measures to address the problems of small scale farming. It will become increasingly important to ensure that these are effective, in order to prevent greater rural poverty and an increase in migration to the cities. The introduction of a certification

system which includes both social and environmental sustainability criteria could add further impetus for such measures.

The case study indicates potential for a significant decline of ethanol production in Europe. Adverse impacts are not expected to be large, but could be significant in sugar beet growing areas during the transitional period.

Environmental impact

The case study compares the greenhouse gas (GHG) emissions and energy balances of the different types of biofuels produced in Mercosur and the EU. It concludes that, even when allowing for transportation effects, sugarcane ethanol from Mercosur has a better energy balance than EU biofuels and also produces lower direct GHG emissions in its production. There will therefore be a significant beneficial impact on climate change from reducing EU trade barriers.

The expected expansion of sugar cane production in Mercosur may have a spillover effect on deforestation in the Amazon, with a significant adverse impact on biodiversity. The introduction of an effective certification system addressing biodiversity issues may therefore be an important mitigating action.

Biodiversity impacts in Europe are not expected to be significant.

There may be adverse impacts on air pollution and water pollution in Mercosur in areas where sugarcane production rises, which may be locally significant in the absence of effective regulation. A certification system for biofuel imports may help to address this issue. In Europe the pollution impact would be beneficial, but as regulation is relatively strong this is not expected to be significant.

Beef case study

Economic impact

The raising of beef cattle and meat processing are expected to increase significantly in Mercosur, mainly in Brazil, with a significant increase in Paraguay. Production would decline in the EU, more in the EU15 than in the accession countries.

Social impact

Beef cattle for export from Mercosur are mainly raised in large farms, where most of the new employment is expected to occur. The study identifies serious concerns over the use of forced labour for cattle raising in Brazil, which the Brazilian government is endeavouring to combat. The trade agreement would exacerbate the problem. Without reinforced mitigation, the number of forced labourers could increase, without any improvement in wages or working conditions above those of the existing workforce. Disputes over land tenure are also expected to increase, with further adverse social impacts for small scale farmers who lose their land. The action being taken by the Brazilian government is therefore critical in mitigating potentially serious adverse social effects.

Employment in the sector in the EU is expected to contract more in the EU15 than in new accession countries. Impacts will be localised, but could be significant in some rural areas of countries such as France, Spain and Ireland, with negative spillover effects on rural development.

Environmental impact

Expansion of cattle in Brazil will require new pasture, much of which is likely to be taken from available lands in the Amazon and the Cerrado. In the Amazon, land has traditionally been made available by deforestation. In the Cerrado, intensification is expected to lead to the cultivation of more

natural pasture in seeded grasslands. Stronger measures of public control will be necessary in both regions to avoid potentially significant adverse impacts on biodiversity.

In Argentina the expected production increase is smaller, and environmental impacts are expected to be localised. The only region with potential for development of beef production is the semi-arid central area, where water is scarce, and significant local impacts could occur. The construction of infrastructure for export production could also have negative environmental impacts, depending on the effectiveness of regulatory controls.

In both countries significant room for manoeuvre exists to increase productivity per unit area using new production techniques (new grass varieties, fertilisers, number of heads/ha), and thus mitigate adverse impacts on biodiversity⁶.

In the EU, beef production is expected to concentrate in regions where the costs of production are lowest, while agriculture in other regions will tend to move to different products. Both positive and negative environmental impacts could occur. Some land may go out of production, allowing a rise in semi-natural habitat. However, farmers in regions where beef production declines would expand their use of other fertilisers to compensate for reduced fertilisation by cattle. With relatively strong regulation, the potentially adverse environmental effects are not expected to be large.

The overall impact on greenhouse gas emissions is expected to be neutral, except for the adverse effect of increased international transport and a small increase in overall production.

3. Sustainability impacts in the EU

Economic

Real income

The CETM model indicates a total static welfare gain of 0.1% GDP in both the EU15 and the EU10 for full liberalisation, of which about a third would come from goods liberalisation (agriculture and manufacturing combined). The impact is positive, as expected from conventional trade theory, but not significant in terms of normal growth rates. The principal long term welfare impact would come from the dynamic effects of switching resources to more competitive sectors of the economy, with a decline in the agriculture sector.

Increased imports from the Mercosur region will compete with domestic products, reducing prices to EU producers and processors. This impact is likely to be felt most at the lower, commodity, end of the market. It is important to appreciate that in many parts of the EU there are important cultural associations between food and drink and geographical identity, with consumer demand placing a premium on products from particular production systems and locations, often favouring traditional products from their own territories. While the strength of these associations has been declining at the undifferentiated commodity end of the market, it is growing at the top of the market. This suggests that increased imports from the Mercosur region would reduce EU prices for commodity products but this would be partly offset by increasing consumption of value added products, differentiated by their EU provenance and production systems.

In products most likely to be imported in volume from the Mercosur region, competition is likely to be felt most keenly for sugar and chicken, with EU producers having greater potential for securing differentiated markets for domestically produced beef and fruit. While EU chicken producers would benefit from lower wheat prices arising from greater imports, this is unlikely to offset the competitive advantage (particularly lower labour costs) of chicken producers in the Mercosur region. A decline in

⁶ GEB, 2004

EU chicken production would therefore reduce demand for grain production, particularly wheat, resulting in lower domestic prices.

The market for apples and pears is already segmented by the different seasons of production (southern and northern hemisphere) but improving storage techniques is prolonging the seasons, increasing competition.

The one product for which competitive displacement of EU agricultural products is not likely to occur is for increased ethanol and biodiesel imports, derived from sugar cane and oilseeds grown in the Mercosur region. The EU Biofuels Strategy⁷ seeks to increase consumption of transport fuels produced from renewable feed stocks, reducing consumption of fossil fuels. While the EU targets for biofuels present an opportunity for EU producers, it is widely anticipated that a significant component of these targets will be met, at least initially, by imports from overseas feed stocks.

The modelling results are broadly in line with these expectations. They indicate that Mercosur agricultural products will tend to replace EU products, particularly for processed foods including meats, and ethanol from Mercosur cane sugar. EU grain output is also projected to decline. The estimated decline is not large (up to 5% for full liberalisation and less for a more realistic agreement), but could be significant in local areas where production of the affected goods is high and competitiveness is low.

Although the overall effect for EU agricultural production is adverse, liberalisation of the Mercosur market would be beneficial for some EU products such as wine, olive oil and spirits. All these products are likely to enter at the top of the consumer market. If this is associated with stronger protection of geographical indications, European wine producers are expected to gain further market share in Mercosur.

Employment

EU employment in the farm and agricultural processing sectors will follow the output changes, and again may be significant in local areas. Employment in primary commodity production in the sugar, wheat, chicken, beef and fruit sectors is likely to fall, particularly in the areas of economically marginal production such as the uplands and mountainous regions where production is least competitive. These agriculturally marginal areas are those most likely to receive rural development support from the CAP for economic adaptation and the maintenance of high nature value areas which will tend to reduce the impact of trade competition. Sugar beet presents something of a special case since its production is highly concentrated in regions that are relatively agriculturally productive, usually in regions with strong economies. While these areas are less likely to receive favoured status for rural development support, it is likely that declining agricultural employment will be absorbed by other economic sectors.

It is likely that opportunities for re-employment would be lower in the EU-10 compared to the EU-15. The CETM model results suggest that the EU-15 will be somewhat more affected than the EU-10, but qualitative considerations suggest that some of the new member states are more vulnerable for some of the affected products. In Europe as a whole, domestic markets are likely to react to provide increased opportunities for employment in the food processing sectors producing higher value products sold with strong geographical indications. This will present opportunities for increased employment in food and drink processing and distribution.

The overall effect on agricultural employment in the EU-15 is expected to be a small addition to the long term trend towards lower agricultural employment. For the new member states the employment

⁷ February 2006, implementing the EU Biofuels Directive of May 2003.

opportunities associated with accession will be somewhat reduced by greater competition from Mercosur.

Fixed capital formation

The reduced competitiveness of EU agriculture is expected to reduce land prices, and hence a fall in its capital value. Some processing facilities for products such as beef and sugar may suffer from closures and a decrease in capital stock. Investments that have been made by the EU sugar industry in Mercosur are unlikely to be affected by the agreement. A reduction of the agricultural capital stock in the EU itself would be partially compensated by investment in products benefiting from greater exports (wine, olive oil and spirits), but the overall effect of the trade agreement is expected to be a transfer of investment out of European agriculture into more competitive economic sectors. The overall effect for the EU economy as a whole is expected to be beneficial.

Social

Poverty

The economic impacts on employment will have corresponding social effects, with a possibility of short term adverse effects on poverty in localised areas. Areas depending strongly on meat, cereal and sugar are the most likely to be affected, particularly in the agriculturally marginal areas and in the EU-10. For beef production, France, Spain and Ireland are expected to be among the most affected. In the new member states, and to some extent in the EU-15, existing problems of unemployment and poverty could increase in the short term, depending on social policies at national level. The additional difficulties could be significant in accession countries where social policies have been dismantled and new systems are not yet fully in place.

Health and education

Imports from Mercosur will continue to comply with EU sanitary and phytosanitary standards (SPS), and no adverse health impact is expected from increased imports. Concerns that have been raised regarding plant diseases and animal welfare are discussed below in relation to environmental quality.

No significant impacts on education are expected in the EU.

Equity

The adverse employment effects are likely to be felt by the least competitive farmers and processing facilities. Some rural areas will be negatively affected, and small farms may be more affected than large ones. As already noted, producers involved in undifferentiated commodity production and in agriculturally marginal areas will be most affected, increasing geographic disequilibrium. More competitive and entrepreneurial farmers will be in a stronger position to decrease their production costs, while less competitive ones will experience greater difficulties. Income inequalities among EU farmers could therefore increase in the short term. Rural development support to maintain traditional agricultural systems, where this is needed to maintain cultural landscapes and nature value, and to encourage diversification into new non-agricultural activities would reduce negative impacts. The longer term impact on income distribution is not expected to be significant.

No significant gender impacts are anticipated.

Environmental

Natural resource stocks

Impacts on the stocks of water and soil will depend on the changes to agricultural production systems. Reductions in the intensity of production or complete agricultural abandonment, which is likely to occur in the agriculturally marginal areas (for instance uplands and mountainous regions) and in value adding production systems (such as organic), will decrease pressure on natural resources. In these areas water supplies and quality could be ameliorated and soil erosion decline. On the other hand, the increased competition from Mercosur imports may stimulate higher intensity of production, which could place greater demand on ground and river water and on soils. The EU Water Framework Directive and the EU Action Plan for Soils will both result in policy measures to address threats to water and soils.

The overall impact of the trade agreement is expected to be a less agricultural production in the EU, and decreased pressure on water supply, with a beneficial effect in those areas where the resource is scarce. Loss of competitiveness may encourage greater intensity of production in order to increase yield, but the overall effect on soil and water resources is expected to be small and beneficial.

Environmental quality

The factors outlined above on natural resource stock also apply to environmental quality. Policy interventions through Pillar II of the CAP (particularly the agri-environment programmes) will seek to address any threats to environmental quality. The quality of water may improve in some areas through reduced use of agrochemicals, although in others there may be adverse pollution impacts associated with a decline in livestock farming and an increase in use of chemical fertilisers. The overall effect is not expected to be significant.

Concerns have been expressed that increased imports of Mercosur produce may increase the likelihood of plant diseases being introduced, particularly for citrus fruits⁸. EU phytosanitary standards have been designed to prevent impacts of this nature. The EC maintains regular surveillance of exporting countries' compliance with these standards, and so it is not anticipated that the EU-Mercosur trade agreement would entail a significant increase in risk.

Concerns have also been expressed in respect of animal welfare, in that standards which relate to methods of production rather than to the characteristics of a product are not permissible under normal WTO requirements. Imports from Mercosur countries would be produced under their own standards rather than EU standards. It has been suggested that EU producers could become uncompetitive, through the higher costs of producing to high standards⁹, or that there would be an economic incentive for the EU to relax its animal welfare standards¹⁰. During the WTO negotiations the EU has proposed that compensation should be permissible for the additional costs of meeting legal standards¹¹. Any such arrangement in the EU-Mercosur agreement would be a matter for negotiation, and would need to be WTO-compliant.

For the potential impact on climate change, the case study for ethanol concludes that increased imports of sugarcane ethanol from Mercosur will have a significantly beneficial impact on greenhouse gas emissions. For beef production, the case study indicates that the combined impact in EU and Mercosur on greenhouse gas emissions will be neutral, except for the adverse effect of increased international transport and a small increase in overall production. For other agricultural products the impact of higher production in Mercosur and lower production in the EU is also expected to be neutral.

⁸ EUCOFEL (2007)

⁹ van Horne and Bondt (2003)

¹⁰ CIWF (2000), EAW (2000)

¹¹ CEC (2003)

The modelling results support this. For full liberalisation of all goods and services they indicate that the production changes would reduce CO₂ emissions in the EU and Mercosur combined (including Venezuela) by less than 0.1%. This does not include emissions of methane, ammonia and nitrogen oxides, which are significant for cattle raising and other agricultural activities. Here too it is expected that an increase in Mercosur will be approximately cancelled by a corresponding decrease in the EU.

An additional factor not allowed for is the effect of forest clearance on carbon sequestration. However, a greater impact on climate change is expected to come from the increase in carbon emissions arising from increased international transport (as discussed in the overall SIA).

Biodiversity

Increased competitive pressure on EU agriculture, particularly on beef, chicken and cereal production, will tend to increase the specialisation of production systems, reducing diversity of habitats. Agriculture specialization is expected to increase, with a concentration of production in some sectors, and a possible small decline in agricultural biodiversity.

Agricultural abandonment could also reduce biodiversity of 'semi-natural' habitats such as hay meadows, but will provide opportunities for recolonisation of 'climax' vegetation. On the other hand a move to less intensive production systems (such as organic) could increase biodiversity. Once again, policy interventions such as the CAP agri-environment schemes will be available to reduce negative impacts.

The overall fall in EU agricultural output is expected to result in an overall impact on biodiversity in the EU that is small but beneficial.

4. Sustainability impacts in Mercosur

Economic

Real income

The CETM model indicates a static welfare gain from full liberalisation of agriculture and manufacturing combined of about 0.3% GDP in Argentina, 0.9% in Brazil, 1.2% in Uruguay and 6% in Paraguay. The estimated effect in Paraguay is particularly significant, with a large contribution from agricultural liberalisation. The static welfare gains in the other Mercosur countries are small in comparison with normal growth rates. The principal long term welfare impact is likely to come from the dynamic effects of the trade agreement.

Output is expected to rise significantly for the agricultural sector as a whole, with little adverse impact from reduced barriers to EU imports. Mercosur production is particularly competitive for meat, cereals, sugar, ethanol and fruits, for which exports to the EU are expected to increase. Production in Mercosur is expected to expand in these sectors, allowing the development of agriculture and of the food industry. Exports of soya products to the EU may fall in response to a fall in EU beef and chicken production.

It is important to consider the impacts that increased exports could have on domestic supply of basic food commodities in Mercosur. Recent experience in Argentina indicates that an increase in beef exports led to severe restrictions in domestic supply and rising prices, followed by political agreement to restrict exports. More generally, rising Mercosur exports have been accompanied by rising production, without which they could become politically unsustainable.

The model projections for full liberalisation indicate a rise in output for grains of the order of 10% for all the Mercosur countries. For animal products, which include cattle rearing, the projected increase is

significant in Argentina and Uruguay at around 4%, and considerably higher in Brazil and Paraguay at over 30%. Similar but larger increases in production are projected for meat and other processed foods, of nearly 50% in Brazil and over 70% in Paraguay. These modelling estimates are for full liberalisation rather than the more limited agreement likely to be reached, and are strongly dependent on the assumptions made in the model. As reported in Section III above, agricultural output in Mercosur has been growing rapidly in recent years, with increasing exports to the EU and other countries. The sector is already highly competitive and is in the process of responding to market opportunities that already exist. The CGE model inherently assumes that the economy is currently in equilibrium, which it clearly is not. It is possible that production would not be able to respond to a further increase in incentives any more rapidly than it is responding to existing ones. Nonetheless, the model results give an indication of the possible magnitude of the effects that could occur over the ten year period in which an EU-Mercosur trade agreement would come into effect.

Employment

Employment in agriculture is expected to rise approximately in proportion to the output changes, as indicated by the modelling results. The model assumes fixed total employment, with the increase in agriculture coming from a decline in other sectors. In practice most of the increase is expected to come from the rural informal sector and the rural unemployed. This will apply for most of the extra employment in agricultural production and for some processing industry (sugar or ethanol for instance), with a smaller increase in urban areas for other processing and transport (including harbour services for the increased exports).

In Brazil and Paraguay, where the percentage increase in output is greatest, the recorded level of rural unemployment is below the national average¹², reflecting the existing trend of rising production and its demand for extra labour. The additional output due to EU-Mercosur liberalisation will encourage a further decrease in unemployment. In Argentina and Uruguay rural unemployment is considerably higher than the national average. The additional demand for agricultural labour in these countries will help to address this problem.

As noted in the case study for ethanol, these effects may change in the longer term through increased incentives for mechanisation, resulting in higher skill levels and lower agricultural employment. The effect of the EU-Mercosur agreement would be an incremental addition to existing pressures in this direction.

Fixed capital formation

The expected increase in agricultural output will stimulate additional investment in the sector. This is expected to include new infrastructure and machinery as well as the acquisition of land. Total agricultural fixed capital should increase.

Social

Poverty

To the extent that the increased employment in the sector comes from the pool of unemployed, it will have a beneficial impact on rural poverty, which is particularly high in Paraguay and Brazil¹³. There may however be an adverse effect associated with the need for additional land. Land tenure is weak in many areas, particularly in Paraguay, where the overwhelming majority of peasants have no formal land titles. Informal farmers are likely to be displaced by the expansion of commercial farming. Depending on the labour productivity of the new commercial activities, the number of employment

¹² IARC (2006)

¹³ IARC (2006)

opportunities may not be sufficient for the number of people displaced, and the standard of living provided by formal employment may be lower than in informal farming. In Brazil in particular, some of the extra land is expected come from forest clearance, with loss of livelihoods for indigenous people.

For expanding production of sugar cane and ethanol, some of these potentially adverse impacts may be countered by the introduction of a certification scheme for ethanol imports into the EU.

The case study for beef has identified a potentially serious concern. A small part of the employment in cattle raising is forced labour. The Brazilian government is endeavouring to combat the problem, but the trade agreement would exacerbate it. Without effective mitigation the number of forced labourers would increase, without any improvement in wages or working conditions above those of the existing workforce, and a significant decrease for the people affected. The case study also identifies a potential increase in disputes over land tenure, with further adverse impacts on poverty for small scale farmers who lose their land.

It is therefore concluded that liberalisation offers potential for a reduction in rural poverty throughout the region, but that there could instead be significant adverse effects in some areas in the absence of strengthened regulation.

Health and education

The impact on poverty, positive or negative, can be expected to have a corresponding beneficial or adverse effect on health. Improved export performance should in principle help to strengthen Mercosur economies overall, which would help enable increased public finance and higher health expenditure. This is particularly the case in Paraguay, where the modelling results indicate a significant increase in overall welfare. In the other Mercosur countries the static welfare gains are too small to be significant in this respect. Dynamic effects offer greater potential in all the countries, but depend strongly on other aspects of government policy that interact with trade liberalisation.

Similar considerations apply to education, with potential for both positive and negative effects.

Equity

Expansion of production will lead to an increase of total farm income, but not necessarily to a reduction of income inequalities in the farm sector. Increased incentives for mechanisation may in the long term lead to higher skill levels in the sector and hence to reduced inequalities for those in employment. This would however be associated with a decline in agricultural employment. The overall impact would depend on increasing quantity and quality of employment in other sectors. In the absence of structural changes leading to higher skill levels overall, a decrease in inequality typically requires redistributive public policies.

The effects on poverty discussed above may, in the absence of effective mitigation, have significant adverse impacts on equity. Competition between farmers for new arable lands is expected to increase land prices, and also land conflicts in areas where land tenure is weak. Small scale farmers could be the losers of that process, including women. Adverse gender impacts may arise through the loss of traditional livelihoods and limited opportunities for women in the formal sector. Working conditions have to be watched with scrutiny. Forced labour in Brazil is already a problem in the bovine sector. Although the government is working to combat it, liberalisation could amplify this problem.

The problems for sugar cane production are smaller, but could be significant. Both sugar and ethanol are expected to develop in new regions where land is available, but where workers are not organised in trade-unions and may have difficulty in obtaining good working conditions. A certification scheme for EU ethanol imports, with appropriate social as well as environmental criteria, could help to address this.

More generally, agricultural export development on its own is not expected to reduce structural income inequalities in Mercosur.

Environmental

Natural resource stocks

Agricultural production is expected to rise significantly in all the Mercosur countries, placing pressure on both land and water. The modelling results indicate a significant rise in grain production in all the countries, with a large increase in meat production in Brazil and Paraguay. The animal products sector also rises significantly in Argentina and Uruguay. As discussed in the case studies for ethanol and beef, there are potentially significant adverse effects from both intensification and extensification.

In Argentina the projected increase in beef production is relatively small. Production is likely to be intensified, with less available land than in Brazil. Significant adverse impacts on water resources are expected to be restricted mainly to the semi-arid central area where water is scarce.

In Brazil the expansion of beef production is expected to have a direct impact on deforestation, while the expansion of sugarcane would have an indirect spillover effect by taking land from products which would move into forested areas. For sugarcane, certification of EU ethanol imports could help to address the problem. For beef and other products the expansion would add to existing long term pressures on forests which need to be addressed by a stronger regulatory regime.

Other potential impacts which may occur from increased production unless adequately regulated may include flooding, especially on the plains such as the Pampas (arising from disruption of soil hydrology), and soil erosion from cultivation of steep slopes.

Environmental quality

In many of the areas where agricultural production would increase, such as the Cerrado, conversion of these lands to arable cropping or intensive grassland management would require application of agrochemicals, artificial fertiliser and irrigation, both of which would have impacts on soil and water quality. Some adverse pollution impacts may occur in this and other areas where production rises, which may be locally significant in the absence of effective regulation. The use of agrochemicals potentially affects both water and soil pollution. An increase in poultry meat production could also have an impact on water contamination, depending on production methods. Effective regulation will be required in order to avoid locally significant impacts of this nature.

As discussed in the ethanol case study, the increased production of sugar cane for ethanol exports to the EU would have an overall beneficial impact on GHG emissions, if sugarcane expansion does not lead to deforestation.

Biodiversity

Large areas of the Mercosur region are of global environmental significance, particularly the Amazon and Cerrado. Global attention is, understandably, focussed on the threats to the Amazon rainforest, the majority of which lies within the Mercosur region. Although timber logging has been the major driver for deforestation in the Amazon, subsequent conversion of land to soya bean production has ongoing impacts on biodiversity and enforces more permanent changes to soils and hydrology.

The Brazilian Cerrado is South America's largest, and one of the world's most biologically rich, areas of savannah. Conversion to monoculture crop production (particularly soya beans) and intensification of beef production is reducing the area of natural and semi-natural habitat, but there remain large areas

of relatively undisturbed cerrado where conversion to soya bean production or cattle ranching would significantly reduce biodiversity.

The region includes extensive areas of wetland at the Deltas of the Orinoco, Parana and Tigre rivers. Conversion to plantation forestry is the main threat to biodiversity.

In other areas such as the Pampas of Argentina, Uruguay and southern Brazil and the Brazilian sertão, centuries of extensive agriculture, particularly cattle ranching, have already replaced the climax natural vegetation with more open grassland. Conversion of grassland to soya bean and cereal production, particularly on the fertile soils of the Pampas has an impact, particularly on areas of pampas that retain diverse semi-natural vegetation.

The last ten years have seen the conversion of the majority of soya bean production to Genetically Modified (GM) varieties. Fears have been expressed about the impact that the transfer of novel genes from GM crops could have to natural organisms and systems. Perhaps because the soya bean is not closely related to any South American plants these fears have not yet been realised.

Any conversion of pristine habitats and natural resources to agricultural production, whether it be cattle ranching, sugar cane plantations or arable cropping, would have significant negative impacts. The increased intensification of the most agriculturally areas, such as the Parana plain and the Pampas, is likely to have fewer negative impacts but, in common with any such intensification of land use, issues of pollution, both diffuse and point source, and reductions in soil quality, would need to be addressed.

As discussed above in relation to natural resource stocks, the projected expansion of beef production and sugarcane are both expected to have adverse impacts on deforestation in the Brazilian Amazon unless countered by effective mitigation. This will also have adverse impacts on biodiversity. In the case of sugarcane, a certification system for EU ethanol imports could be an important mitigating measure.

There is the potential for environmental benefits arising from production of biofuels (principally from sugar cane and oilseeds) provided the systems of production and processing avoid the significant negative impacts outlined above.

The beef case study also identifies a potential adverse impact on biodiversity through production development in the Cerrado, where intensification is expected to lead to the cultivation of more natural pasture in seeded grasslands. Stronger measures of public control will be necessary in both regions to avoid potentially significant adverse impacts. There is still room for manoeuvre for intensification on current seeded grasslands, and thus to avoid the destruction of natural ecosystems.

5. Summary of sustainability impacts

The impacts discussed above are summarised in the following tables.

Table 6.5. Sustainable development impacts of agricultural liberalisation in the EU

Impact	Countries / sectors affected	Causal factors	Factors affecting significance	Potential significance	
				short term	long term
Economic					
<u>Real income</u>	All	Lower consumer prices for meat	Long term gain depends on growth of	↑	↑?

			other sectors		
<u>Employment</u>	Areas of economically marginal production. Sugar, wheat, chicken, beef, fruit.	Competition from Mercosur imports	Rural development support	↓	↓
<u>Fixed capital formation</u>	All	Fall in land value and closure of facilities	Long term gain depends on growth of other sectors	↓	↑?
Social					
<u>Poverty</u>	Areas of economically marginal production. Accession countries most vulnerable.	Fall in employment	Social policies	↓	-
<u>Health and education</u>				-	-
<u>Equity</u>	Less competitive small farms	Fall in employment	Rural development support	↓	-
Environmental					
<u>Natural resources</u>	Water and soils	Reduced production	Water Framework Directive and Action Plan for Soils	↑	↑
<u>Environmental quality</u>					
Water and air pollution	Mixed effects	Reduced production, higher intensity	Regulatory framework	-	-
Plant diseases and animal welfare		Lower Mercosur standards	Border monitoring of EU standards and surveillance	-	-
Greenhouse Gas emissions	Global	Benefit from Mercosur ethanol. Smaller adverse transport and other effects	Certification of biofuel production	↑	↑
<u>Biodiversity</u>	All, mixed effects, beneficial overall	Specialisation, abandonment.	Policy interventions in CAP reforms	↑	↑

Legend: ↑ beneficial greater significant impact, ↓ adverse greater significant impact, ↑ beneficial lesser significant impact, ↓ adverse lesser significant impact, ↑↓ beneficial and adverse impacts likely to be experienced according to context (may be lesser or greater as above), - non-significant impact compared with the base situation.

Table 9.1. Sustainable development impacts of agricultural liberalisation in Mercosur

Impact	Countries / sectors affected	Causal factors	Factors affecting significance	Potential significance	
				short term	long term
Economic					
<u>Real income</u>	Paraguay, less significant in others	Export development, lower consumer prices	Long term gain depends on growth of other sectors	↑(↑)	↑?
<u>Employment</u>	Greatest in Brazil and Paraguay. Meat, grains, ethanol production.	Export development	Long term effect depends on overall structure of economy	↑	-
<u>Fixed capital formation</u>	Land acquisition, machinery, infrastructure	Export development	Long term gain depends on overall growth of economy	↑	↑?

Social					
<u>Poverty</u>	Greatest in Brazil and Paraguay.	Demand for agricultural labour	Land tenure, forced labour	↑↓	-
<u>Health and education</u>	Paraguay beneficial, others mixed.	Poverty, government expenditure	Long term effect depends on overall growth of economy	↑↓	-
<u>Equity</u>	Mixed effects, potentially adverse for women	Land conflicts, mechanisation	Employment in other sectors, redistributive policies	↑↓	-
Environmental					
<u>Natural resources</u>	Greatest in Brazil and Paraguay for land. Argentina for water	Increased agricultural production	Regulatory regimes, ethanol certification	↓	↓
<u>Environmental quality</u>					
<u>Water and air pollution</u>	All	Increased production, agrochemicals	Production methods, regulatory framework	↓	↓
<u>Greenhouse Gas emissions</u>	Global. See impacts for EU			↑	↑
<u>Biodiversity</u>	Greatest in Brazil, Amazon and Cerrado	Deforestation and monocultures for increased production	Regulatory regimes, ethanol certification	↓	↓

Legend: ↑ beneficial greater significant impact, ↓ adverse greater significant impact, ↑ beneficial lesser significant impact, ↓ adverse lesser significant impact, ↑↓ beneficial and adverse impacts likely to be experienced according to context (may be lesser or greater as above), - non-significant impact compared with the base situation.

Greater and lesser significance are defined by the SIA methodology as:

- *lesser significant impact* – marginally significant to the negotiation decision, and if negative, a potential candidate for mitigation
- *greater significant impact* – significant to the negotiation decision, and if negative, merits serious consideration for mitigation.

VII. THE CONSULTATION PROCESS

The Inception report of the Agriculture SIA was presented in July, during a Civil trade Society Dialogue in Brussels. Since these meeting, several written comments were received, from Civil Society Organisations (CSOs), private and public sector¹⁴. Seven reactions are from EU organisations: 2 from CSOs (one on development issues, one on animal welfare) and 5 from private sector (meat, sugar, ethanol, food and drink industry). Only one Mercosur reaction was received, coming from Brazilian representatives to the European Communities.

Those reactions are geographically unbalanced. It seems important to enhance Mercosur participation, particularly from private sector and CSOs in the rest of the process.

Consultation process will be continued by two ways: (i) meetings with CSOs, private sector, experts and searchers on the potential impacts of the association agreement, and (ii) electronic discussion. This discussion will regroup CSOs, private sector and researchers, both from Mercosur and EU sides. The objective of this e-consultation is to validate the main results and to propose flanking measures. Opportunities of next meetings will also be used to discuss with stakeholders about the SIA process.

¹⁴ European producers: European livestock and meat trading union, European Committee of Sugar Manufacturers, European Union of Ethanol Producers, Peat Industry Ireland, CIAA (European Food and Drink Industries)

European NGOs: CORDAID, Eurogroup for Animal Welfare

Mercosur: Mission of Brazil to the European Communities

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ANNEX 1. CASE STUDY: ETHANOL

1. Introduction

Biofuels are fuels made of biologic products. Two main kinds of raw material can be processed to produce biofuels: carbohydrate (starchy products or sugar), and oilseeds to produce vegetable oil, used in natura or esterified.

Ethanol is made from starchy products or from carbohydrates. It is used in gasoline engine blend or pure, depending on the engine technology. Ethanol production in Brazil is mainly driven by sugar manufacturers. For those firms, processing ethanol is adding value to sugarcane. In the EU ethanol is mainly produced by processing cereals (mainly wheat).

Biodiesel and in natura vegetable oil are extracted from oilseeds. In the EU, this kind of biofuel is mainly produced by crushing rapeseed or sunflower seed. In Brazil, this production is rather new, and soybeans and Jatropha fruits are used as raw material. Vegetable oils can be used in most engines, blended with diesel. As vegetable oil's viscosity is higher than gasoline's one, minor adjustments have to be done to engines, to allow them to accept up to 100% vegetable oils. Vegetable oils, once esterified, form Biodiesel, whose viscosity is similar to gasoline.

In this case study, we will identify the impacts of trade liberalisation of ethanol on sustainable development. As ethanol production and trade are strongly linked with the sugar industry, we will assess these value chains as a whole. We will first present sugar and ethanol production, in the EU and Mercosur. Then, we will assess the sugar and ethanol world market, and identify the EU and Mercosur positioning. Last we will identify impacts of trade liberalization on economy, environment (especially on Greenhouse Gases and biodiversity) and on social issues. As available land to produce biofuels is limited, ethanol environmental performance will be compared with that of other biofuels.

2. Sugar and ethanol production in the EU and Mercosur

2.1. Sugar and ethanol, different products from a same industry

Sugar (C₁₂H₂₂O₁₁.) is pure saccharose. It can be obtained both from sugar cane and sugar beet. Ethanol (C₂H₅OH) is the ethyl alcohol resulting from the fermentation of several plants: cereals (wheat for instance), sugar cane, sugar beet, potatoes, tubers...

In Mercosur, both sugar and ethanol are exclusively extracted from sugar cane. The production is mainly based in Brazil (which represents 95% of Mercosur production according to Faostat), that will be our reference country for all the data treated in the Mercosur area. In Brazil, ethanol production uses almost 50% of sugar cane (UNICA).

In the European Union, sugar can be extracted from sugar beets, and ethanol from sugar beets and cereals.

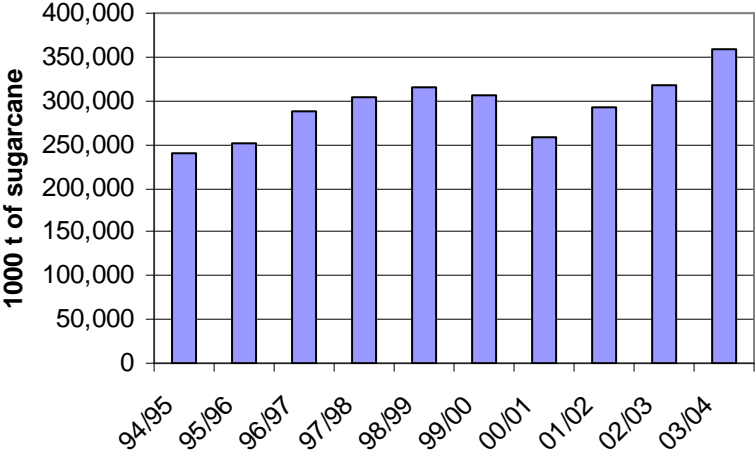
Ethanol is first fermented from sugar and it contains water. This hydrous ethanol is corrosive for most gasoline engines. In Brazil, most of the new cars are flex fuel and their engine accepts hydrous ethanol. After dehydration, anhydrous ethanol is obtained. When blended it can be used easily in gasoline engines.

2.2. Sugar cane in Brazil

Due to heat and water needs, sugar cane can only grow in tropical and subtropical regions. The same plants can be harvested over 5 years in average, varietal researches are carried out to extend this production cycle and to increase the yield.

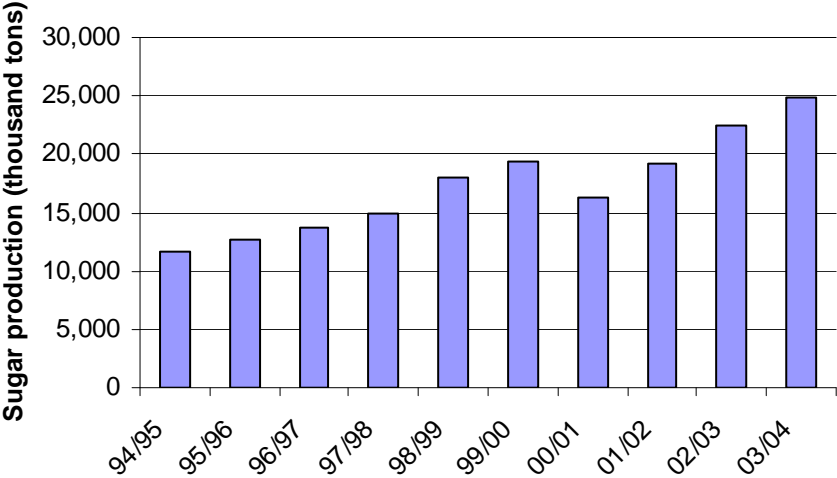
Since 1994 Brazilian production of sugar cane has increased (graph 1). Sugar and ethanol both benefited from that growth (graphs 2 and 3). In the 90s, more than 70% of sugarcane was used to produce ethanol. Currently sugarcane is almost equally transformed into sugar and ethanol. (UNICA)

Graph 1: Brazilian sugar cane production in tons, from 1990 to 2004



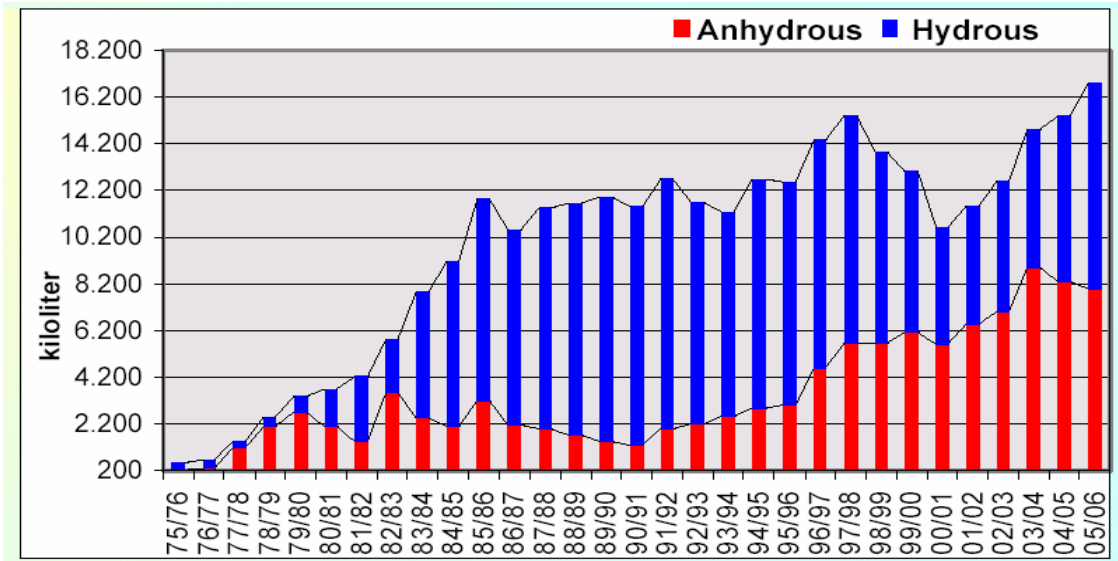
Source: UNICA

Graph 2: Brazilian sugar production from 1994 to 2004 (thousand tons)



Source: UNICA

Graph 3: Ethanol production



Source: UNICA

The total surface area of Brazil is 845 millions of ha, of which 66 millions of ha were arable land in 2002, but with a potential estimated at 549 millions (FAO). 6 millions hectares of sugarcane have been planted, which represents around 10% of cultivated arable land (FAO 2002).

Production is concentrated in two regions: more than half of the total area is in the South East, mainly in Sao Paulo State. Almost 20% of the area is located in the North-East. Nevertheless, the area is quickly increasing in the North, where almost 80% of the sugarcane is processed into ethanol (chart 1 and table 1).

Chart 1: Sugarcane surfaces in Brazil in 2005 and evolution

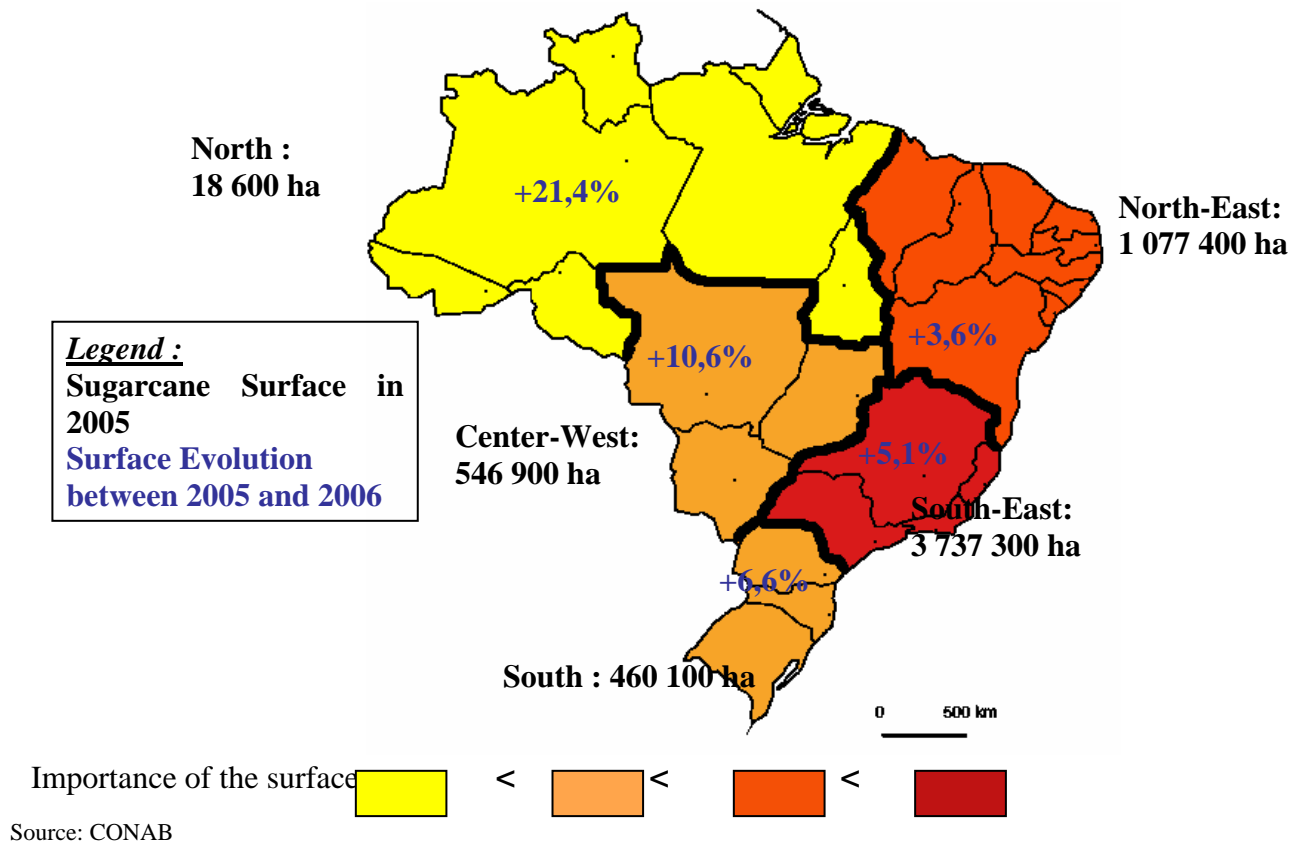


Table 1: Part of sugarcane for ethanol production in Brazil, 2005

	Part of sugarcane surface for ethanol production (%)	Sugarcane surface (ha)	Surface for ethanol production (ha)	Part of the total surface for ethanol production (%)
North	79.6	18,600	14,806	1
North-East	25.5	1,077,400	274,737	12
Center-West	52.8	546,900	288,763	13
South-East	38.8	3,737,300	1,450,072	64
South	48.6	460,100	223,609	10
Brazil	38.5	5,840,300	2,251,987	100

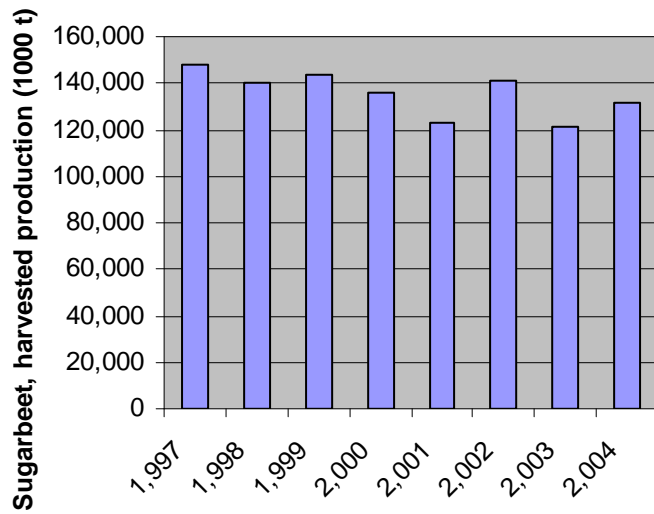
Source: CONAB

2.3. Sugar beets and wheat in the EU

Sugar beets are produced in the EU, as this crop needs a more moderate climate. Wheat is produced in the EU as well as in the Mercosur countries. Both crops are annual.

In 2004, the EU25 produced 131 millions tons of sugar beet and 18.7 millions tons of sugar, and in 2005 2.5 billions liters of ethanol (FO-Licht). Since 1997 Sugar beet production is slightly decreasing, influenced by CAP reform (fig. 4). Germany and France each account for 20% of the EU25 sugar production, followed by Poland (10%), Italy and the United Kingdom (Eurostat).

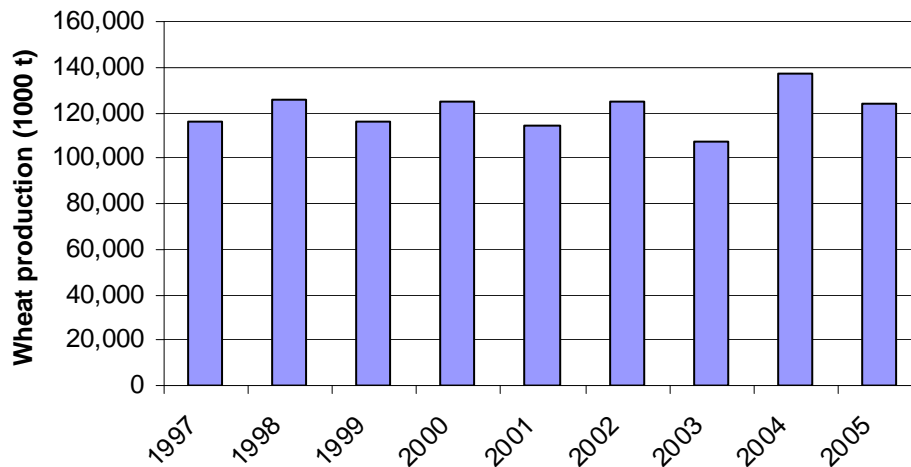
Graph 4: EU 25 sugarbeet production in thousand tons from 1997 to 2004



Source: Eurostat

Wheat production fluctuates around 120 to 140 millions tons (fig. 5). This fluctuation is explained by climate effects like drought in France in 2003, and variation in the surface area depending on the wheat price.

Graph 5: EU 25 wheat production in thousand tons from 1997 to 2005



Source: Eurostat

As shown in the table below, in the EU 25, wheat production occupies 23 million ha in the EU 25, which represents almost 25% of arable land. France alone produces a bit less than a quarter of the total, and the four main producer countries (France, Germany, Poland and Italy) represent half of the production.

Table 2: EU 25 wheat production, average 1997 to 2005

	Wheat surface (1000 ha)	Yields (100 kg/ha)
EU 25	22,987	53
France	5,120	71

Germany	2,917	74
Poland	2,476	36
Italy	2,317	32
Spain	2,225	26
United Kingdom	1,927	77
Hungary	1,102	40

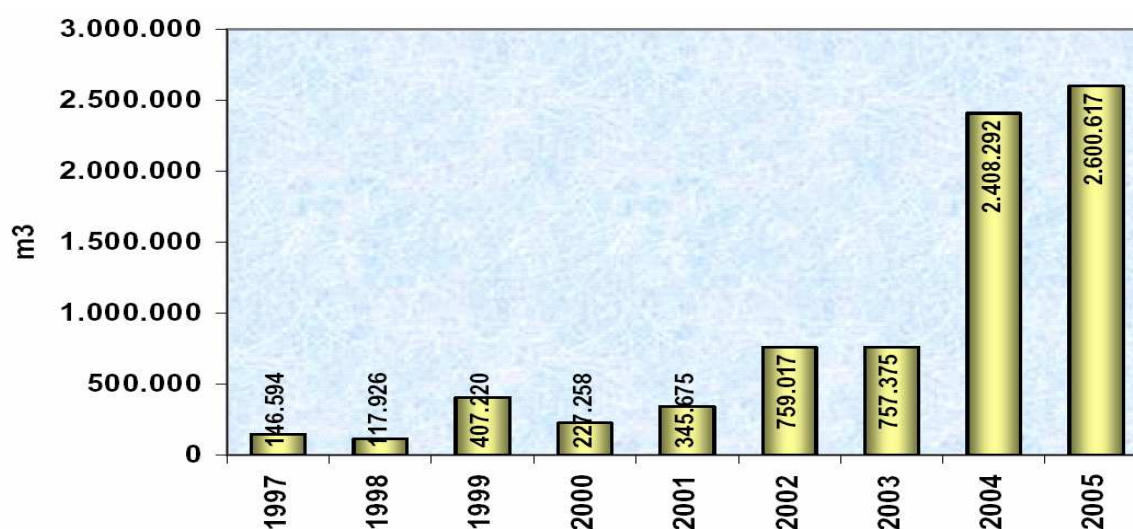
Source: Eurostat

Main ethanol producers are Spain, followed by France, Poland and Sweden (Von Lampe, 2006).

2.4. A strategic sector for Brazil

In 2005, the sugar and ethanol production represents 0.03% of the EU GDP (European Commission, 2006), while it accounts for 2.35% of Brazil GDP and 1.41% of the Mercosur GDP. Since 1997 ethanol exports have boomed (Graph 6).

Figure 6: Brazilian ethanol exports from 1997 to 2005



Source: Canaplan

2.5. Sugar and ethanol: a social stake in Brazil and in the EU

Brazil's sugar and ethanol agribusiness represents 1 million direct employments and covers 60,000 growers who supply sugar cane. The entire sugar/ethanol chain employs around 3.5 million people. This activity has a strong presence in the economies of over 960 municipalities, which represent around 17 percent of Brazil's municipalities in a whole. Due to the need to process sugar cane soon after the harvest, sugar manufactories are established in rural areas, with a positive impact on rural employment. Mechanisation of harvesting could decrease the number of jobs in plantations, because one combine harvester replaces 80 workers (UNICA). On average, farms account for around 300 ha, but most of the industries have their own plantations, and individual suppliers represent the minority of industries' needs.

Working conditions in sugar cane fields are reported to be one of the most difficult of the country. Various commentators refer to mills that withhold basic food supplies for workers who cut an average of less than 10 tons of sugar a day. Workers must execute, on the average, 9,700 machete strokes to attain the 10-ton daily quota. This causes an overall debilitation of the system, due to the heavy workload, as well as leading to cramps and physical damages that sometimes result in heart attacks. (Human rights in Brazil 2005, Social Network for Justice and Human Rights).

Brazilian sugarcane is mainly grown by large scale farmers. Nevertheless the Brazilian government’s biofuels policy could make this situation change: factories sourcing their feedstocks from small farmers will get tax exemptions. (Brazilian Ministry of Agriculture, 2006). Thus small scale production could develop.

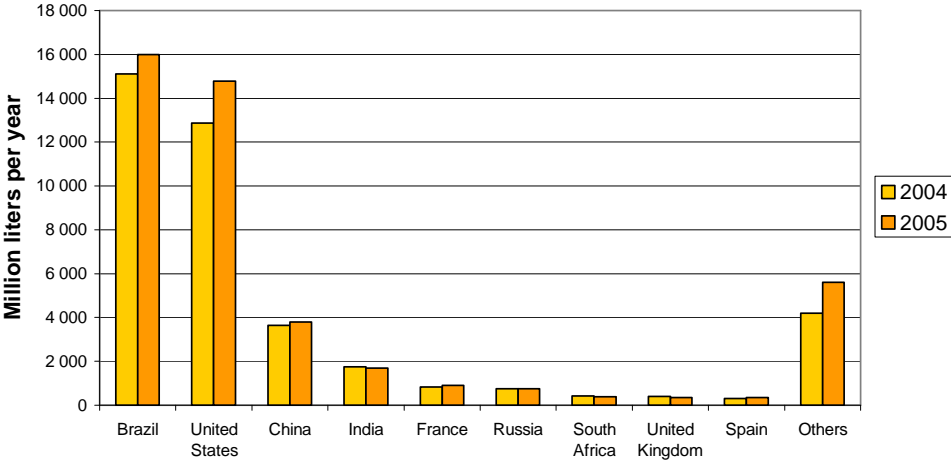
In the EU-15, the increased productivity in sugar beet production and processing has led to rationalisation and job reduction in the sugar sector during recent years. From 1995 to 2005 for instance, the number of people working in the processing industry during the processing period have fallen from 52,000 to 32,000, while sugar processing industry permanent employment decreased, from 32,000 in 1995 to 16,000 in 2005. The number of growers also decreased: from 264,000 in 2000 to 220,000 in 2005. (Eurostat)

Sugar beet production is also a social issue in new member states. In EU-10, almost 10,000 people work permanently in the sugar beet processing industry, of whom 90% are in Poland, and sugar beet production accounts for 83,000 growers (94% in Poland) (CESF). Sugar beet growers represent almost 10% of the Polish agricultural labour force (Eurostat).

3. Ethanol world market

Brazil and the United States lead the world ethanol market. With production over 15 billion litres each, they became the two major suppliers of this market. China and India are also important players with a production somewhat less than 4 billion litres. In Europe, France, Spain and Germany are the main producers of Ethanol. In 2005 the EU produced 2.5 billion litres of biofuel (FO Licht 2005), of which almost 1 billion litres was ethanol (IFP). This is less than Chinese production but greater than Indian.

Graph 7: World production of ethanol



Source: F.O. Licht, 2005

Brazil is both the largest world producer and consumer of ethanol, as a result of 35 years of bio-energy promotion.

EU ethanol imports have been multiplied by more than four since 2001, coming mainly from Brazil since 2001 (table 3). Before, Pakistan was the main EU supplier of ethanol. (Comext). In 2005, Brazil exported to the EU 416,000 tons of Ethanol, thus 527 millions litres¹⁵.

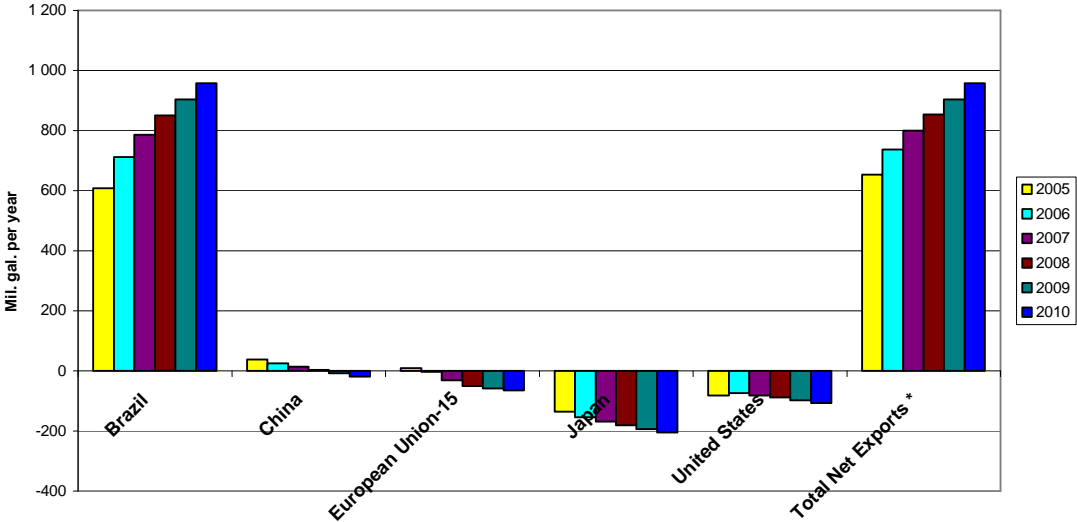
Table.3: EU imports of Undenatured ethyl alcohol, of actual alcoholic strength of >= 80% (HS 2207 10), in tons

Years	2001	2002	2003	2004	2005
Total imports extra-EU25	95,890	142,257	217,229	266,349	416,992
Brazil	895	24,264	29,965	69,708	134,916

Source: COMEXT

According to FAPRI (graph 8), Brazil is expected to become the major world exporting country in the next decade. The United States, despite its large production, will not be able to produce a sufficient volume to cover its needs and will have to import more and more ethanol. The Brazilian trade balance is expected to increase over the years mostly because of the large reserve of land where sugar cane production is possible. The EU trade balance is likely to deteriorate, but less than in Japan or the US.

Graph 8: Ethanol trade balance forecast (2005 – 2010)



Source : FAPRI

4. Brazilian competitiveness in the sugar and ethanol sectors

4.1. Brazilian advantages for sugarcane production

This country has significant advantages in this market, with low production costs, tropical weather, fertile soil, high technology, and exploitation of the by-product for energy generation.

Sugar cane is an extremely versatile raw material. Absolutely everything from the cane is used: bagasse, syrups, cake and waste from the harvest. From it, sugar and various types of alcohol can be made; beverages can be manufactured and electricity can be generated from the bagasse (material obtained by crushing the cane to extract the sweet juice). The bagasse will feed the boilers, where it is

¹⁵ Ethanol density=0,789

burned and the energy produced turns water into steam. The steam is used to produce both the heat and the electricity needed in the sugar and alcohol manufacturing process.

Sugar cane accounts for the most important share of the cost of production of sugar. It represents around 65% of the cost of sugar production, with the remaining 35% in processing (UNICA). For a farm situated in the Centre-South area, the planting cost accounts for 1,000€ per hectare every 5 to 8 years. Manual harvesting costs 3.3€ per ton and a person collects 9 tons per day. Mechanical harvesting is by harvest convoy, for a unit price of 500,000€. Each harvest convoy collects 700 tons per day (UNICA).

4.2. Brazil ethanol competitiveness

The competitiveness of Mercosur ethanol does not only rely on cheap raw material. The Proalcool incentive programme was the main trigger of the Brazil ethanol sector in the 1980s. Proalcool aimed to develop ethanol production after the oil shock of 1973. The ethanol price was fixed by Petrobras (government firm) and subsidised by government to lower its price. As the oil price decreased in the 1980s, Proalcool expenditures increased dramatically. In that period this programme finally ended and the ethanol sector was disorganised. At the end of the 1990s the ethanol price was liberalised and Petrobras lost its monopoly. Since then, Brazilian policy focuses on competitiveness (research) and demand (tax reduction on cars using ethanol). Currently the maximum percentage of anhydrous ethanol in blended gasoline is fixed by the Ministry of Agriculture at almost 25%.

Ethanol productivity has increased significantly over the last two decades, from 4,200 litres of ethanol per hectare sugar cane in the early 1980s, to 6,800 litres/ha in 2003 (UNICOPA, 2004; Peres de Lima, 2006).

Brazilian ethanol factories are of three main types. The first is exclusive to ethanol production and has no other purpose than to produce alcohol. The second has the ability to switch easily between the production of sugar and ethanol following changes in relative prices (Tokgoz et al., 2006). A new generation of these flexible factories can switch between one product to another in a few minutes. They are now implemented at a large scale in São Paulo State. This provides to Brazil a huge advantage, making it able to adapt instantly to both sugar and ethanol markets and probably lead them.

Finally, the development of capacity mainly depends on available areas for ethanol crops. In this case, Brazil has an important advantage. To produce 10% of national consumption for domestic transport, the country would need only 3% of its agricultural area, whereas European Union 15 would need 72% of its crop area. Thus, Brazilian competitiveness is linked to its ability to develop its production capacity rapidly and at a large scale. (Von Lampe, 2006). European Commission

Costs of production remain very low compare to USA or Europe. As a result, Brazilian ethanol is the cheapest in the world (table 4).

Table 4: Production costs of ethanol according to country and crop, US\$/Liter

	Wheat	Corn	Sugar cane	Sugar beet
USA	0,545	0,289		
Canada	0,563	0,335		
EU 15	0,573	0,448		0,56
Poland	0,53	0,337		0,546
Brazil			0,219	

Source: Von Lampe, 2006

Ethanol made from sugar cane is more profitable than ethanol made from any other crop. Thus Brazilian ethanol is profitable against oil when the barrel price averages \$30, while European sugar beet ethanol is profitable when the oil price reaches \$90 (Von Lampe, 2006).

In 2003 the EU set a target to increase the renewable fuel percentage in fuel consumption up to 5.75% in 2010 (Directive 2003/30/EC). To achieve this goal, European States implement tax exemption and excise tax exemption on biofuels. Von Lampe has calculated that 31.5 million hectares would be needed for biofuels in order to achieve 10% of total transport fuel requirements, which corresponds to 18.1 million hectares for the 5.75% target. This is marginally higher than the estimate given in the European Commission's impact assessment of the Biofuels Strategy (CEC 2006). The EC estimates that 4.35 million hectares would be needed to achieve 25% of the target, corresponding to 17.4 million hectares for the full 5.75% target. The EC calculations show that the 17.4 million hectares required for the full target would approximate to 14% of EU-25 total arable land. The von Lampe calculations assess the transport energy requirements for the EU-15 only, for which the area required for meeting the full target would be about 41% of the EU-15 land area that is currently devoted to the appropriate crops (grains, oilseeds and sugar). The land required per unit energy produced is expected to reduce significantly in the future through technological and economic developments, but most analysts do not expect them before 2015 (EC, 2007). Due to the limited area available to produce biofuel crops and the relatively high cost of EU production, significant imports are expected to be necessary to achieve the objective of increasing the use of biofuels within the EU.

5. Biomass certification

The production of biofuels uses energy which itself generates greenhouse gas emissions, and the production process may also have other adverse environmental and social impacts. In order to ensure that the replacement of fossil fuels by biofuels makes a positive contribution to reducing climate change and does not have other impacts that are unacceptable, several countries have been developing standards for biofuels or have taken initiatives to develop certification systems¹⁶. The European Commission has played an important role through the development of a Biomass Action Plan¹⁷ and an EU Strategy for Biofuels¹⁸. It is planned to introduce a form of European certification to ensure that biofuels will count towards renewable energy targets only if their cultivation complies with minimum sustainability standards.

The EU Biofuel Strategy states that assistance will be given to suitable developing countries through EU development policy, to help them capture the economic benefits offered by biofuels, and to support the development of effective regulatory frameworks which would mitigate environmental risks and address sustainability concerns.

The United Nations Conference on Trade and Development (UNCTAD) launched a BioFuels Initiative in 2005, to facilitate biofuel initiatives among UN and non-UN bodies. The initiative aims to share experience and provide support to developing countries, and provide UNCTAD membership with access to sound economic and trade policy analysis, capacity building activities and consensus building tools. An UNCTAD study¹⁹ reports evidence that in Brazil sugar cane production can have favourable effects on other crops rather than competing with them. This synergy comes from (a) the additional income enabled through sugar cane agro-industrial activity, which improves general conditions for producing other crops, and (b) the high productivity of sugar cane per unit of land, which enables relatively small land occupation.

The UNCTAD study also examines the potential effects of biofuels on food prices and small scale farming. It suggests that, in the long term, the income effects from energy crop cultivation and removal of food price subsidies may offset short term adverse impacts on poor consumers in developing countries. The study also considers the possibility that economies of scale in the

¹⁶ van Dam et al (2006)

¹⁷ EC (2005)

¹⁸ EC (2006)

¹⁹ UNCTAD (2006)

cultivation and processing of many energy crops may disadvantage small and local producers. Large-scale export production might generate income but provide fewer livelihoods. It is suggested that organizational support may be needed in order to facilitate the involvement of small farmers, including the promotion of contract farming arrangements or cooperatives. Ideally, small producers would be involved at the local level, while large companies take care of the international trading of feedstocks.

The UNCTAD report expects labelling and certification to be important factors in addressing these concerns, and argues that they need to contribute to environmental objectives without creating unnecessary barriers to international trade, especially to exports from developing countries.

The bioenergy task programme of the International Energy Agency (IEA) has summarised proposed sustainability criteria that may be used in certification schemes, as developed in a range of national and other initiatives²⁰:

1. GHG balance: net emission reduction compared with fossil fuel reference by at least 30% in 2007 and 50% in 2011;
2. Alternative uses: criteria for competition with food, local energy supply, medicines and building materials;
3. Biodiversity: no deterioration of protected areas or valuable ecosystems;
4. Economic prosperity: insight into possible negative effects on the regional and national economy and active contribution to the increase of prosperity.
5. Well-being: criteria for working conditions, human rights, property rights, rights of use and social conditions,
6. Environment: criteria for waste management, use of agro-chemicals, soil erosion and fertility, quality and quantity of surface and groundwater, air emissions

The IEA notes several difficulties which need to be overcome in the development of an effective certification system:

- Lack of adequate criteria and indicators
- Requirement of effective control and monitoring system
- Open market limits effectiveness of certification system
- Small stakeholders' limitations to implement requirements
- Stakeholder involvement required for a legitimate and reliable system
- Limitations related to (inter-) national legislation and international trade
- Cost levels of biomass certification
- Issues related to inequalities in development and trade

A certification scheme which covers imports as well as domestic production would need to address these difficulties, and be sufficiently rigorous to be effective in addressing sustainability issues, while complying with WTO rules and not unduly constraining infant biofuel industries or acting as a surreptitious trade barrier. The experience of forest certification attained by organisations such as the Forest Stewardship Council is expected to be of particular value in addressing these concerns²¹.

6. Impact of trade liberalisation of ethanol

6.1. Economic impacts

Currently an additional duty (102 €/m³) is applied on denatured ethanol imports at the EU border (source Export Helpdesk, European Commission). As ethanol density is 0.789, this additional tax will

²⁰ van Dam et al (2006)

²¹ WWI (2006)

represent 129 €/ton. In 2005, the FOB price of ethanol (HS 2207 20) imports to the EU was 320 €/ton, thus the buying price was 449 €/ton (0.562 €/L) and was similar to the EU cost of production.

The price for ethanol in the EU is mainly determined by the world market price plus the EU import tariff plus transport costs. The world market price itself is determined by factors which include fossil fuel prices and world supply and demand, including Brazil's supply and demand. Although future world prices will depend on changes in both supply and demand, ethanol liberalization by the EU would increase Brazil's export profitability by the amount of the tax that is removed. On the hypothesis of 1 Million tons this would represent a total of 102 Millions Euros of extra-profitability for ethanol exporters. Thus the investment potential of this sector will increase. According to stakeholders, this amount would permit investment in a factory of a capacity of 2 millions tons of sugar cane per annum.

If liberalization were total, Brazilian ethanol being cheaper, it could replace European production. Depending on the prices, this sector could become unprofitable for European production.

6.2. Environmental impacts

GHG emissions and energy balance of biofuels from Mercosur and the EU

The economic analysis indicates that a reduction of EU import tariffs would result in a significant increase in imports of ethanol from Mercosur. Much of the increase would be to satisfy increased EU demand, but the lower import price may also lead to a significant fall in EU biofuel production. European and Brazilian biofuels have different energy balances and produce different greenhouse gas (GHG) emissions. Europe produces mainly biofuels based on vegetable oils (biodiesel and *in natura* vegetable oil). We decided to compare those biofuels, in order to determine the impact on global GHG emissions. *In natura* vegetable oils are produced for farms' own consumption or for the close neighbourhood. Due to the limited land area available in the EU, it would not be realistic to obtain all EU fuel consumption from vegetable oil. Sugar beet ethanol has a worse energy balance and GHG emissions than wheat ethanol²². We therefore chose to assess wheat ethanol.

The energy balance is the ratio between obtained energy and consumed energy. To evaluate this, two main studies have been used: an assessment realised in 2002 by PricewaterhouseCoopers for the French Agency for energy, ADEME, provided raw data for European ethanol. Brazilian data have been provided by Carvalho Macedo in March 2004, for the Government of the State of Sao Paulo, Sao Paulo (Brazil). In our calculation we have reduced the 2002 figure for energy consumption in processing facilities by 20%, to take into account advances in energy efficiency that have been made since 2002.

A common methodology has been established. Consumed energy has been calculated from cultivation to distribution. In the case of sugar cane ethanol, transport has been valued conventionally (assuming 250 km by river transport, 250 km by road, and 10 000 km by sea transport). The consumed energy for these different kinds of transport is extracted from the ADEME assessment.

Consumed energy is attributed to the production of both ethanol and by-products. By products are used to replace another product, feedstuff for instance. We decided to assign to the by product the amount of energy necessary to produce and deliver the product it replaces. This systemic method explains the main differences with the ADEME results. The ADEME assessment assigned consumed energy proportionally to the mass of biofuel and by products.

²² As sugar beets are not harvested during the whole year, they have to be processed in juice that has to be concentrated in syrup, consuming energy. It is not the case for sugar cane ethanol.

The Brazilian assessment took into account energy amortization for buildings and machinery. We decided to do the same, assigning 0.05 MJ/kg for Brazilian production and 0.2 MJ/kg for Ethanol and Biodiesel European production. This amount is four times greater than for Brazilian production because European production uses machinery such as molecular sieves for the production of ethanol and methanol (used to produce biodiesel). This estimate is approximate only, but it only marginally affects the final result. Because *in natura* rapeseed vegetable oil is produced for own-farm consumption (or the close neighbourhood) we assumed that this biofuel is not transported. Imports of oilseeds or vegetable oils for European production of biodiesel would entail higher energy consumption and a worse energy balance than the figures given in Tables 5 and 6 for biodiesel from domestic feedstocks.

Table 5: Energy consumption used to calculate energy balance (in MJ/kg)

Biofuel	Cultivation	Transport	Process	Total
Sugar cane Ethanol	2.31	0.62	0.72	3.65
Wheat Ethanol	7.4	0.20	16.90	24.51
<i>In natura</i> Rapeseed vegetable oil	18	0 ²³	1.80	19.80
Biodiesel (Methyl ester of rapeseed)	13.1	0.7 MJ/kg	8.43 (3.24 for methanol)	22.23

GHG emissions have been calculated per MJ of fuel produced. The gases taken in account are Carbon Dioxide, Methane and Nitrous Oxide with a global warming potential of respectively 1, 23 and 296. A value of 60 g eq Carbon Dioxide/MJ has been decided for fossil energy consumption (against 77 in the Brazilian assessment). Methane is not very important in European biofuel production, but it is for Brazilian production as 80% of the harvest is manual, and slash and burn of the leaves is practised, producing methane. Nitrous oxide has been taken into account as follows: 1 to 2% of the fertilizer needs for the crop, and 0.28 g eq Carbon Dioxide per unit of Nitrogen. Nitrous oxide produced by bagasse combustion in Brazilian plants has not been valued. Those figures are valid if by-products are completely used as feedstuff. In that case the Nitrous oxide production can be assigned to by-products.

Table 6: Energy balance and GH emissions

Biofuel	Energy balance	GHG emissions
Europe		
Wheat ethanol	1.41	45 g eq CO ₂ /MJ
Rapeseed <i>in natura</i> vegetable oil	3.80	4 to 10.6 g eq CO ₂ /MJ
Rapeseed biodiesel	2.29	24.8 g eq CO ₂ /MJ
Brazil		
Sugarcane ethanol	5.82	20.6 to 24.1 g eq CO ₂ /MJ

Sugarcane ethanol has the best energy balance of the four biofuels (table above). Even when transported from Brazil to Rotterdam, the invested energy is multiplied by almost six, while it is multiplied by less than four for *in natura* vegetable oils, the best EU biofuels. Furthermore, Brazilian ethanol produces less GHG than European ethanol by almost a factor of two.

Brazil has been producing ethanol for 35 years. As EU production is more recent its environmental performance may improve in the future. The production process is the most energy-consuming step (16,9 MJ/kg). Straw could replace natural gas as the source of energy, which would improve the energy balance and GHG emissions. But, according to INRA²⁴, almost 50% of the straw that is normally buried for fertilisation purposes would be used to fulfil the energy needs of ethanol production, so that soil fertilisation could be adversely affected. Moreover, using straw as the energy

²³ As Rapeseed *in natura* vegetable oil is produced and consumed at the farm level, transport cost is supposed to be immaterial.

²⁴ INRA, 2006

source would increase the ethanol price by € 64 per hectolitre. Nevertheless, as fossil energy will become more expensive, using straw as the energy source will become more competitive in the future.

Environmental performance of next generation of biofuels will probably be more efficient, but this technology is not yet available for commercial purposes. The Biofuels Research Advisory Council expects the availability of this technology in 2010-2015²⁵. New biofuels should be more expensive than first generation ones, even if their price is supposed to decline by 2020²⁶.

It may therefore be concluded that the reduction of EU import barriers to Mercosur ethanol would have a significant beneficial impact on both the energy balance of the fuel and the GHG emissions from non-energy aspects of production.

Pollution from cultivation and plants

Other potential pollution impacts associated with the production changes include pesticides and pollutants such as liquid waste and smoke from burning fields. An adverse impact may occur in those areas in Mercosur where production rises, which may be locally significant in the absence of effective regulation. Adverse pollution impacts from increased sugar processing may be countered to some extent by new investment in more modern plants using newer and cleaner technology. A certification scheme such as discussed above, along with EU support for strengthening regulation and the development of new technologies, would help to mitigate the potentially adverse effects.

If EU ethanol production falls as a result of price competition, the pollution impact in the EU arising from ethanol production would be reduced. The industry is however relatively well regulated, so the impact of the trade agreement is not expected to be significant.

Biodiversity impacts

According to CONAB, the sugar cane land area increased between 2005 and 2006, mainly in the North (by 21,4%) and Centre West (10,6%). The most sensitive ecoregions, Amazon and Cerrados, are situated in those areas. Traditional sugar cane producing areas expanded their areas more slowly (by 3 to 6%) but as their sugar cane area is already important, a small increase will have a larger impact.

The climate of the Amazonian forest is too rainy for growing sugar cane. However, the expansion of sugar cane production elsewhere in the region may displace the production of other crops, some of which can be grown in Amazon, such as cotton, soybeans or livestock. An expansion of sugar cane production may therefore have a spillover effect on deforestation in the Amazon. The introduction of an effective certification system addressing biodiversity issues may therefore be an important mitigating action.

Biodiversity impacts in Europe are not expected to be significant.

6.3. Social impacts

As noted above, Brazilian sugarcane is mainly grown by large scale farmers, with particularly poor working conditions for farm labourers. The initial impact of an increase in ethanol production would be a rise in employment, with some improvement in wages or working conditions in order to attract workers. An increase in labour costs may increase incentives for mechanisation, resulting in higher skill levels in the longer term, and lower employment. In view of the much higher productivity levels

²⁵ Biofuels Research Advisory Council, march 2006

²⁶ EC, 2007

available from mechanisation, the long term effect may be a fall in employment, despite higher production, with higher wages and better conditions.

The increase in land area required for increased production is likely to come from small farms producing other crops, with a loss of livelihoods for small scale farmers. The Brazilian government policy of giving tax exemptions to small farmers supplying biofuel feedstocks could be an important mitigation measure. The introduction of a certification system which includes criteria for social issues may add further impetus to such measures. Without effective mitigating measures of this nature, the long term impacts of increased sugarcane production in large scale commercial farms could include greater rural poverty and an increase in migration to the cities.

In Europe, ethanol production may fall significantly as a result of price competition, despite increasing demand. Farmers growing raw materials would therefore have to develop new products. Adverse social impacts are not expected to be large, but could be significant in sugar beet growing areas during the transitional period.

ANNEX 2. CASE STUDY: BEEF MEAT

The Mercosur countries have comparative advantages in beef production which are expected to expose EU producers to greater competition when trade barriers are reduced. In order to assess potential sustainability impacts of an EU-Mercosur trade agreement the case study examines the economic, social and environmental factors associated with beef production in both Mercosur in the EU and trends in their evolution.

1. European Beef Market

1.1. Production

In 2005 the EU25 bovine livestock amounted to 86 millions heads. The three main producers, France, Germany and the United Kingdom, represent almost half of the total. A second group of countries is formed by Poland, Spain, Ireland and Italy which have 5 to 6 millions heads each. A third group is formed by countries accounting for 1 to 5 millions heads (Belgium, Czech Republic, Denmark, The Netherlands, Austria, Portugal and Sweden). Last, 8 of the 10 countries who joined the EU in 2004 have less than 1 million heads (Latvia, Lithuania, Malta, Hungary, Cyprus, Estonia, Slovakia, Slovenia), as do Finland, Greece and Luxemburg.

EU-25 cattle have decreased since 2001 by 16%, from 90 to 86 million heads in 2005. Even if the number of heads is declining, meat production has decreased less quickly since 1996, and remains stable at around 7.3 millions tons in the EU15. This decline of number of heads is more acute in the ten new Member-States. Slovakia, Czech Republic, Estonia, Poland, Lithuania, Latvia and Hungary have lost more than 20% of their cattle from 1996 to 2005 (table 1). In the EU-15, the decline is stronger in countries specialised in dairy production (Denmark, Finland, the Netherlands, for instance) than in countries having both dairy and suckler cows (France, Ireland). In the same period, number of heads increased in three countries (Spain, Portugal and Greece).

Table 1: Evolution of cattle in the EU 25 (,000 of heads and percentage, 1996-2005)

	1996	nin	1998	1999	2000	2001	2002	2003	2004	2005	Evolution 1996-2005 (%)
EU-25	97 624	96 229	94 642	93 842	90 704	90 339	88 759	87 489	86 412	85 804	-12
EU-15)	84 536	83 498	82 779	82 585	80 032	79 965	78 527	77 479	76 637	75 864	-10
Slovakia	892	803	705	665	646	625	608	593	540	528	-41
Czech R.	1 866	1 701	1 657	1 574	1 582	1 520	1 462	1 427	1 368	1 352	-28
Estonia	343	326	308	267	253	261	254	257	250	252	-26
Poland	6 958	7 029	6 455	6 093	5 723	5 499	5 421	5 277	5 200	5 385	-23
Denmark	2 052	2 026	1 968	1 976	1 891	1 840	1 740	1 681	1 616	1 572	-23
Lithuania	1 054	1 016	923	898	748	752	779	812	792	800	-24
Latvia	509	477	434	378	367	385	388	379	371	385	-24
Hungary	909	871	873	857	805	783	770	739	723	708	-22
Germany	15 760	15 227	14 942	14 658	14 568	14 227	13 732	13 386	13 031	12 919	-18
Finland	1 150	1 125	1 101	1 068	1 035	1 019	1 012	977	952	945	-18
Cyprus	70	62	56	54	54	53	58	59	60	58	-18
Belgium	3 071	2 978	2 984	2 970	3 001	2 908	2 758	2 684	2 657	2 604	-15
Netherlands	4 366	4 287	4 184	4 097	3 890	3 842	3 780	3 735	3 759	3 746	-14
Italy	7 390	7 328	7 316	7 361	6 232	6 933	6 695	6 727	6 515	6 460	-13
Luxemburg	209	205	202	203	200	198	190	185	184	182	-13
Sweden	1 747	1 708	1 712	1 680	1 618	1 617	1 576	1 553	1 552	1 533	-12
UK	11 430	11 347	11 237	11 281	10 878	10 161	10 381	10 519	10 425	10 160	-11
Austria	2 272	2 198	2 172	2 153	2 156	2 118	2 067	2 052	2 051	2 011	-11
France	20 541	20 334	20 055	20 216	20 089	20 320	19 777	19 168	18 948	18 930	-8
Ireland	6 661	6 882	6 952	6 558	6 330	6 408	6 333	6 223	6 212	6 192	-7
Slovenia	486	446	453	471	494	477	473	450	451	453	-7
Portugal	1 389	1 386	1 409	1 421	1 414	1 404	1 395	1 389	1 443	1 441	4
Spain	5 905	5 869	5 966	6 291	6 164	6 411	6 478	6 548	6 653	6 464	9
Greece	593	597	579	652	568	559	613	651	640	707	19
Malta	na:	na	na:	na:	na:	19	19	18	19	20	Na

Source: Eurostat

In 2005 EU15 beef production was 7.2 million tons carcass weight equivalent. This production is as large as in 2001, but it should be noted that 2001 was the worst year of the second BSE incident, when consumption dropped by 15%. The cattle number includes both dairy and beef cattle.

Table 2 : Bovine meat production, EU 15 (thousands of tons carcass weight equivalent)

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Evolution 1996-2005 (%)
EU-15	7 954	7 889	7 651	7 691	7 416	7 265	7 466	7 361	7 446	7 279	-8

Source : Eurostat

EU livestock is constituted by two kinds of animals: dairy livestock and suckling livestock. Dairy cows are reared for their milk, and suckling livestock for their meat. Beef meat comes from both categories. Young bulls coming from dairy livestock are grown for meat production purposes, and dairy cows, when unfit for dairy production, are slaughtered to supply meat. In this case, meat is a by-product of dairy farming, but some farms are specialised in growing and fattening young bulls from dairy cattle. Animals born from suckler cows are grown only for meat production. Suckling breeds are

selected for their meat quality and productivity, while dairy breeds are selected for milk productivity. Meat quality differs from one category of cattle to another. Lowest quality comes usually from dairy cows, and the best from 3-year old suckling cattle. However, the production method has an important impact on meat quality, linked to growth speed and breeds.

Dairy cows represent almost one quarter of the total bovine livestock in the EU (which includes calves, young bulls, bullocks, dairy cows and other cows). In many of the new member states the cattle herd is more strongly oriented towards dairy. Some countries are mainly specialised in suckling livestock: Ireland, Greece, Spain, France, while others are specialised in dairy production (Estonia, Cyprus, Latvia, Lithuania, Poland, Hungary, Netherlands and Denmark).

Table 3: Dairy cows in percentage of the total livestock

	2001	2002	2003	2004	2005		2001	2002	2003	2004	2005
EU 25	28	28	27	27	27	Germany	31	32	32	33	32
EU 15	25	25	25	25	24	Italy	30	29	28	28	29
Lithuania	59	57	55	55	52	Austria	28	28	27	26	27
Poland	53	54	53	53	51	Slovenia	28	30	29	30	27
Latvia	54	53	49	50	48	Sweden	26	26	26	26	25
Estonia	49	46	45	47	45	Luxemburg	22	22	22	22	22
Cyprus	46	45	45	43	43	Portugal	24	24	24	23	22
Hungary	44	44	42	42	40	UK	22	21	21	21	20
Malta	43	43	42	40	40	Belgium	21	21	21	21	21
Netherlands	40	41	42	40	40	Greece	31	25	23	23	21
Slovakia	37	38	36	37	38	France	21	21	21	21	21
Denmark	34	35	35	35	35	Ireland	18	18	18	18	18
Finland	35	34	34	33	33	Spain	18	18	17	16	16
Czech R.	33	32	31	31	32						

Source: Eurostat

Small scale farms are dominant in EU cattle production. Half of them have less than 10 heads. In the EU 15, small scale farmers are less important than in the 10 Eastern and Central European Countries. Those kinds of farms are socially important, especially in the new Member States (Czech Republic, Estonia, Latvia, Lithuania, Poland, Slovenia and Slovakia) and also in Portugal where they represent more than 70% of the cattle farms. Nevertheless, small scale farms represent only 4.6 millions heads out of a total of 88 millions in 2003.

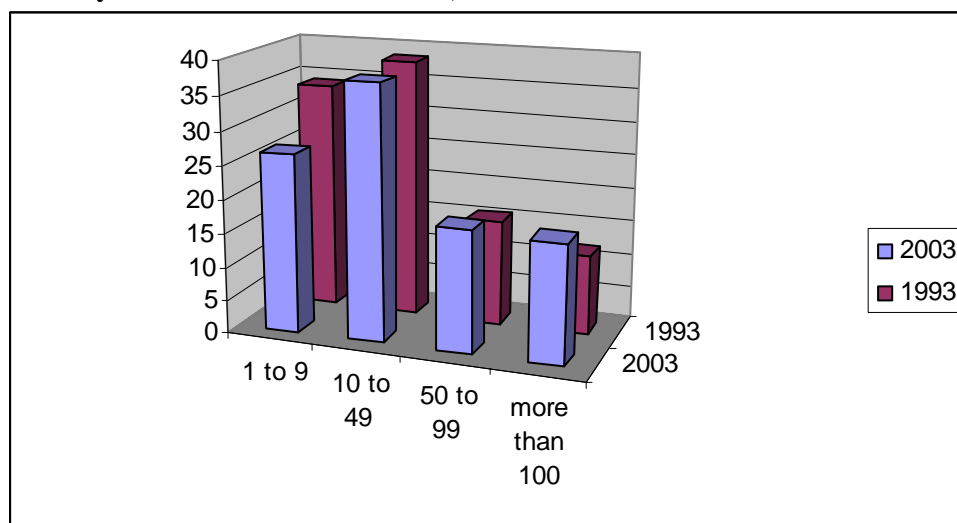
Table 4 : Structure of production in 2003 (number of farms by number of heads classes)

		Total	1 to 9 heads	10 to 49 heads	50 to 99 heads
EU 25	<i>Number of farms</i>	2,610,684	1,423,602	690,734	251,735
	<i>% of the total</i>	100	54	26	9
EU 15	<i>Number of farms</i>	1,349,157	358,783	508,329	243,868
	<i>% of the total</i>	100	26	37	18

Source : Eurostat

In the EU 15, 83% of the farms have less than 100 heads. However, more than half of the production comes from farms with 100 heads or more. Production is very concentrated in Estonia, Hungary and Cyprus, where farms of more than 300 heads account for more than 50% of the national cattle. Nevertheless, in the main producing countries like France, Germany, large scale farms (>300 heads) represent only (respectively) 9 and 19% of the total cattle.

Graph 1: Evolution of the production structure from 1993 to 2003 in the EU 15 (percentage of farms by classes of number of heads)



Source: Eurostat

In the EU 15 in the past ten years, livestock has been concentrating: small scale farms are decreasing while medium and large scale farms are increasing.

1.2. Trade balance

The EU is the second largest beef meat consumer in the world, after the USA, with 8.2 millions of tons carcass weight equivalent in 2006. This consumption has more than recovered from the BSE crisis in 2001 and represents 16% of world beef consumption, which is almost 50 millions of tons (source USDA).

Since 1996, EU exports have decreased, while imports have increased. Usable production has decreased slightly, and domestic consumption has increased. In 2002, EU 15 consumption could be covered by domestic production, and the trade balance was equal. In 2003 the trade balance for bovine meat turned negative for the first time in 20 years (Institut de l'Élevage, 2005).

Table 5 : EU 15 imports, exports, production and consumption of bovine meat

	1996	1997	1998	1999	2000	2001	2002
Total imports from third countries (1000 t)	371	372	364	384	494	552	728
Total exports to third countries (1000 t)	971	1,024	735	900	718	622	716
Usable production (1000 t)	7,940	7,875	7,643	7,661	7,422	7,356	7,459
Total domestic uses (1000 t)	6,970	7,085	7,316	7,496	7,217	6,781	7,519

Source: Eurostat

1.3. Impact of the CAP reform

Since the Luxembourg Agreement (2003), the EU has decided to decouple direct payments to farmers. Furthermore, the bovine meat Common Market organization was deeply reformed: there is no more market intervention since 2002, when it was replaced by a safety net. Nevertheless the Member States have the option to retain a certain element of coupled support in the future, for some products like beef. For instance 60% of direct payment for beef in France remains coupled with production.

This reform aims to encourage farmers to respond to market signals. Nevertheless, most of the cattle breeders are located in regions where crop cultivation is not profitable (such as Ireland or the Massif

Central in France), and it will be difficult for them to shift to other production. Furthermore, any change of production requires time, and production patterns are not expected to evolve rapidly, particularly in specialised regions. Prices will be the main driver for production evolution, and they will depend more on the market and its openness than on agricultural policy. (Lherm, 2003).

Milk sector reform has also an influence on beef production. Under the proposals discussed at the Honk Kong WTO meeting, export subsidies would be removed. As a consequence of CAP reform, the intervention prices for skimmed milk powder and butter have decreased, and thus the income of breeders. This income loss is compensated by direct payment (Faucheux, 2006). If further price decreases occurred from the Hong Kong proposals, some breeders may choose to end their production and sell their cattle. This would have a short term impact on the meat price.

According to EC estimates²⁷, EU 25 beef meat production should fall from 8 millions t cew in 2002 to 7.5 millions in 2011. In the same period EU 25 consumption should increase from 7.9 millions t cew in 2002 to 8.1 millions t cew in 2011.

2. Brazilian beef meat sector

2.1. Production

Beef livestock amounted to 173.8 Million heads in 2006 with 1.8 Million farms and 6.9 Million workers. Dairy livestock accounted for only 34 Million heads. Previously situated mainly in the South - South East, production is increasing more and more and growing in the Central West, the region of Sao Paulo, North (GEB, 2004).

Table 6: Brazilian bovine production, exportation and consumption

	2000	2001	2002	2003	2004	2005	2006 (*)
Livestock (millions head)	146.3	150.4	156.3	161.5	165.5	169.6	173.8
Production (milliers tec)	6,570	6,900	7,240	7,630	8,500	8,300	8,100
Exportation (thousand tec)	554	748	881	1175	1628	1900	2050
Domestic consumption thousand tec)	6,150	6,225	6,400	6,475	6,900	6,500	6,100

(*) prevision

Source: GEB, 2006

Brazilian production is 80% from the Zebu breed and crosses with European breeds (Bradford, Canchim, Limousin), and 20% from other Brazilian breeds (Gir, Cangaïam, Brahman). Zebu meat is low quality (sourness, hardly any marbling, lack of carcass uniformity), but with high rusticity and high reproduction performances. Crosses give better results, with better quality of meat and leather.

Large scale (more than 1.000 ha, more than 800 bovines) and extensive production dominates in the country with the “fazendas” that have three quarters of the cattle. Those farms are specialised. Farm owners often live in town and engage a manager. Medium scale farms (100 to 1 000 ha; 50 to 800 bovines) are family owned. Those farms are less specialised and have fewer employees. Breeders with family small holdings are still present, and are more diversified with a lower productivity and technological level. 75 % of beef is produced in specialised farms, half of them with more than 500 heads.

Farmers can specialize in birth, growth or fattening. Slaughterhouses and processors are well established but not well coordinated. Finally, the distribution is very diverse. Associations, syndicates, and research institutes also exist to help and advise farmers with breeding and other agricultural improvements (Institut de l’Elevage, 2004).

²⁷ <http://ec.europa.eu/agriculture/publi/caprep/prospects2006/tabmeat.pdf>

Brazil has the lowest production costs of the world market with 0.86\$/kg (Brazilian Ministry of Agriculture). In 2004, there was a fall in consumption of beef meat: 35kg/year/inhabitant, mainly due to price and low incomes.

Table 7: Cost of production of bovine meat in different countries

Country	Brazil	New Zealand	Argentina	Australia	United States	Ireland
Cost of production (\$/kg)	0.86	1.12	1.18	1.64	1.72	2.72

Source: Brazilian Ministry of Agriculture

In 2005, export of beef meat amounted to 1.5 billion euros (800 000 tec), representing 6% of total agricultural exports (CHELEM database). Ten years ago, this trade represented only 200 millions \$ (GEB, 2004).

2.2. Social issues

6.9 million people work in the sector (GEB, 2004), out of a total population of 186 millions (World Bank, 2005). Market demands and public investment have resulted in increasing human activity in the Brazilian Amazon. This has fuelled disputes over land tenure and forest degradation. Conflicts arise because enforcement of land tenure regulation is weak and land titling is a long process (Barreto, 2006).

In its 2005 report on forced labour, the ILO reports that “since early 2003, the Government of President Lula da Silva has adopted yet stronger measures to combat forced labour and impunity in Brazil.” In 2003, almost 5000 slave workers have been freed by governmental interventions. The ILO defines slave labour as “degrading work conditions and the impossibility of leaving the employer owing to fraudulent debts and the presence of armed guards”.

According to the ILO, 25,000 workers are victims of slave labour, mostly in the Amazonian states of Pará and Mato Grosso. 80% of them work in cattle raising. Many of these workers, mostly men, are trafficked by intermediaries who recruit workers in urban centres in north-eastern Brazil. On that topic, Brazilian action to solve this problem is held out as an example for the Latin-American continent (ILO, 2005).

2.3. Impacts of beef production on ecosystems

Breeding development in Brazil is strongly linked with pasture cultivation, which has permitted a significant increase in productivity per ha. Nevertheless, pasture degradation is currently an issue. Pasture degradation is a consequence of overgrazing. (Balbino, 2002)

This phenomenon affects each bovine production region: natural pastures decrease to the benefit of seeded grasslands. For instance in the South East seeded grasslands have grown by 3 million ha during the 1990s, while natural pastures decreased by 1 million. In that region natural pastures occupied 10 million ha in 2002, and seeded grasslands 29 millions. (GEB, 2004) Low prices of land and poverty are the main causes of deforestation. Halting the cycle of soil degradation and abandonment is an important issue. Sustainable production methods exist, such as the integrated silvopastoral approach, but are insufficiently implemented. The Livestock, Environment and Development LEAD Initiative targets the protection and enhancement of natural resources as affected by livestock production while alleviating poverty²⁸.

²⁸ The LEAD (Livestock, Environment And Development) Initiative is an inter-institutional project with the secretariat in FAO. This initiative is supported by the World Bank, the European Union (EU), the Ministère des Affaires Etrangères (France), German Federal Ministry for Economic Cooperation and Development via GTZ (Germany), the

Two main ecoregions are affected by bovine production development: the Amazon and the Cerrado.

Amazon

Production increase is slowly eating into the Amazon forest: from 1970 to 2003, 16% of the native forest has been transformed in agricultural land. In a report for World Resources Institute and the Amazon Institute of People and Environment, Barreto estimates that in 2002, 47% of the Brazilian Amazon is under some type of human pressure, either as areas under pressure from human settlement (19%) or areas subjected to incipient human pressure (28%). The states of Rondonia, Mato Grosso and Para are particularly affected by both kinds of pressure (Barreto, 2006). Cattle ranching is the predominant use in deforested areas throughout the region. Around 40% of the pasture in use has a low stocking rate of less than 0.5. Areas deforested for cattle ranching occupied about 70 per cent of the total deforested area by 1995 and pasture area continues to grow. (Schneider et al., 2002).

Between 1990 and 2003, the cattle herd in the Legal Brazilian Amazon increased from 26.6 million to 64 million heads (IBGE 2005). Lower land prices and slightly higher productivity make mid and large-scale pastures more lucrative than in other regions in Brazil. Moreover, low density ranching offers a lower financial risk than crop production such soybean. Nevertheless crops are developing in regions formerly used as pastures. As a consequence, cattle breeding is moving from the margin to the core of Amazon (Barreto, 2006). This displacement can be explained by the fact that profitability per ha is higher for soybean than for cattle breeding. Furthermore pastures are exploited in an unsustainable way, leading to pasture degradation. Growing soya beans is a way to restore pasture soils (GEB, 2004).

Nevertheless, according to a World Bank assessment, the economic potential of ranching relies on climate and particularly on precipitation: it is significant in the Dry Amazon (17% of lands, less than 1800 mm per year), an area situated in the south of the legal Amazon, while it is not in the rest of the Amazon. This is mainly due to the fact that the dry season restricts the multiplication of endemic diseases and their vectors (Schneider, 2000). Deforestation has a variety of environmental consequences: loss of biodiversity²⁹, soil erosion, nutrient depletion, loss of watershed regulation functions and emission of greenhouse gases (Barreto, 2006).

Brazilian law requires that landowners protect riparian forests and conserve 80 percent of forest cover on their properties as legal reserves. Nevertheless enforcement is a challenge: law violation is estimated from 60 to 70 %. The federal government aims to expand the protected areas system by 2010. There is currently enough area without human pressure to do it, but due to fast growth of activity in the Amazon, this protected area expansion must be done quickly. (Barreto, 2006)

Cerrado

The Cerrado is the second largest ecoregion in Brazil (206 millions ha), after the Amazon basin. Most of the Cerrado ecoregion is located in the Brazilian Highland Plateau (UNESCO). The Brazilian Cerrado welcomes 10,000 different plant species, 4,400 being endemic³⁰, and 1,268 vertebrate species (117 endemic). (Myers, 2000) Despite its biodiversity, much of the Cerrado has been converted to agriculture and cattle ranching. Since the 1970s, seeded grassland surface has developed, from 10 millions to 49.5 ha in 1999. (Balbino, 2002) That is the reason why the Cerrado is a biodiversity

Department for International Development (United Kingdom), the US Agency for International Development (USA), the International Development Agency (Denmark), the Swiss Agency for Development and Cooperation (Switzerland), and the Food and Agriculture Organization of the United Nations (FAO). (<http://www.virtualcentre.org/en/frame.htm>)

²⁹ An estimated 10 to 20% of all known species live in Brazil

³⁰ A species that is *endemic* is unique to a defined place or region (in other words *only* found in that place or region) and not naturally found anywhere else.

hotspot for conservation priority (Myers, 2000). As in the Amazon, each Cerrado farm has to conserve 20% of its surface as natural area (Balbino, 2002) but the implementation of this obligation is not complete (Barreto, 2006).

3. Beef meat production in Argentina: High quality product / Low costs

In Argentina, beef livestock accounted for 48 millions heads in 2002 (GEB, 2004). In the 1970s, it accounted 80 millions heads and has since decreased. Beef production has high importance in Argentina. It accounts for 2.5% of GDP, 58% of the gross production value of breeding activities. It includes, in 2005, 850,000 jobs in primary production. (INTA, Instituto Nacional de Tecnología Agropecuaria).

Moreover, beef production has a high importance for Argentine consumption: it is the country with the biggest consumption in the world with 62.8 kg/capita per year in 2005 (ONCCA, INDEC, SENASA) representing 2.3 millions tons in total. As well as a high internal consumption, exports are important too (record level in 2001: 0.6 millions tons) with a value of 1.39 billions US\$ in 2005 (Agriculture Ministry of Argentina, SENASA³¹). The main Argentina importers are Russia and the EU (especially Germany).

Livestock is dispersed all over the country but a concentration can be noted in the Pampa, particularly in the provinces of Buenos Aires (37% of the total production), Córdoba and Santa Fe (12% each). (Instituto Nacional de Tecnología Agropecuaria). In the past 10 years, this sector has not developed, while soybean production has increased, representing more than the half of the cultivated crop area of the country. This trend is particularly strong in the Pampa, where profitability for cattle breeding is half that for soybean cultivation. Even if the volume of production remains stable, production areas are changing.

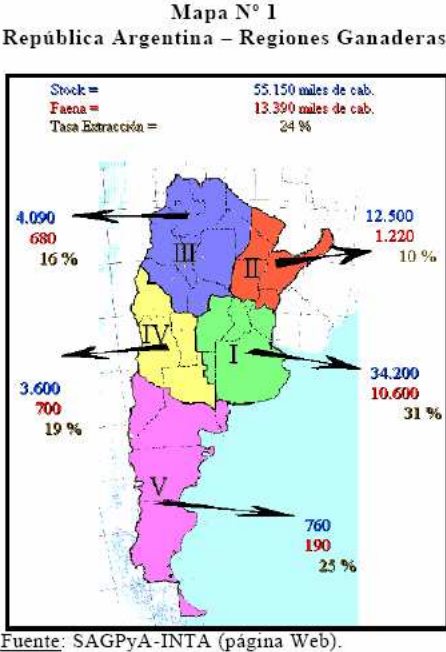
In the Pampa area total production has decreased by 7% in 7 years, while cattle breeding has concentrated in areas with bad cultivation conditions (flooding pampa grasslands). In the North East area where climate is humid tropical, almost 25% of bovine production is located. In this region production is slightly decreasing and almost 50% of the pastures are damaged by overgrazing.

In the North West region, breeding is mainly practiced in the Chaco, in fragile ecosystems. The only region where production can still expand is the semi-arid central area, constituted by two ecoregions: calden forests (shrublands) and Monte. Nevertheless this potential development will be limited by water availability and lack of transport infrastructure (GEB, 2004 and FAO³²).

³¹ Servicio Nacional de Sanidad y Calidad Agroalimentaria
³²

<http://www.fao.org/ag/AGP/AGPC/doc/Counprof/Argentina/argentina.htm#3.%20CLIMATE%20AND%20AGRO%20ECOLOGICAL>

Chart 1: Map of Argentinean ecoregion:



- I: Pampa
- II: North-East area
- III: North-West area
- IV: Semi-arid central area
- V: Patagonia

4. Impact of trade liberalisation on the beef meat sector

4.1. Economic impact

The reduction of EU import tariffs is expected to lead to higher exports of beef meat from Mercosur to the EU, and hence to an increase in beef production and cattle rearing in Mercosur. Within the CETM model cattle are aggregated with other animals and raw milk in the animal products group. The results of the model give an indication of the possible order of magnitude of production changes for the group as a whole that might arise from full trade liberalisation. As expected, output of animal products is shown to increase in Mercosur and decrease in the EU, as shown in Table 8. The Mercosur expansion occurs mainly in Brazil and Paraguay, with a decrease in the EU. Although there may be significant variations between different products in the group, the figures are broadly indicative of the potential production changes for beef cattle if trade were fully liberalised. Cattle rearing is expected to contract more in EU15 than in EU10, due to the fact that the EU15 is more specialised in meat production than the EU10.

Expansion of beef cattle in Brazil and other Mercosur countries will be associated with effects on meat production and the meat processing value chain (slaughtering, processing). These are included along with other processed agricultural produce in the “processed foods” sector in the model. The processing sector as a whole is projected to expand in Mercosur and contract in the EU. Within this, the changes in production of beef meat are expected to be similar to those for cattle.

Table 8: Output changes in the animal products sector for full liberalisation. Results of the CETM (percentage change)

	Argentina	Brazil	Paraguay	Uruguay	EU15	EU10
Output	4.1	31.9	36.6	4.6	-3.5	-1.0
Employment	5.9	47.4	76.7	17.1	-5.2	-2.6

Source: CETM

4.2. Social impact

Employment in the beef sector is likely to increase in Mercosur countries. The model results for full liberalisation give an indication of the possible magnitude of the effect in each of the countries, varying up to a maximum of the figures given in the above table according to the degree of liberalisation achieved in the agreement.

Beef cattle for export are mainly grown in large farms, where most of the new employment is expected to occur. Effects will probably be modest on small and medium scale farms, and inequalities within beef cattle growers may increase.

The efforts of the Brazilian government to combat the use of forced labour in cattle raising will be a key factor in mitigating potentially serious adverse social effects of trade liberalisation. Without this, the number of forced labourers can be expected to increase, without any improvement in wages or working conditions above those of the existing workforce. Disputes over land tenure can also be expected to increase, with further adverse social impacts for small scale farmers who lose their land.

In the EU, employment is expected to contract more in the EU15 than in the EU10, due to the concentration of beef meat cattle in EU 15 Member States, such as France, Spain and Ireland. Impacts will be localised, but could be significant in some rural areas of these countries, with spillover negative effects on rural development.

4.3. Environmental impacts

Expansion of cattle implies a need for new pastures in Brazil. Overall crop production is not expected to reduce, and the new pastures are likely to be taken directly from available lands, in particular in Amazon and in the Cerrado.

In the Amazon, land has traditionally been made available by deforestation, and bovine production is integrated in a process that leads on to soybean production³³. In some areas public controls are not sufficient to regulate deforestation, and so it is probable that the development of bovine production will occur through an increase in land area. Public control will be a key factor in mitigating potentially significant adverse environmental consequences.

In the Cerrado, intensification is expected to lead to the cultivation of more natural pasture in seeded grasslands. Thus biodiversity will be adversely affected. The legally enforced conservation of natural areas will be a key mitigation measure.

In Argentina, the results of the CETM modelling are consistent with the qualitative considerations discussed above, in indicating that the production increase will be fairly small. Impacts on ecosystems are therefore likely to be less acute. Nevertheless, the only region with potential for development of beef production is the semi-arid central area, constituted by two ecoregions: Calden forests (shrublands) and Monte. In that region significant environmental impacts could occur. Water is scarce, and an increase in bovine production could cause problems. Furthermore, this region lacks infrastructure. Building roads and other infrastructure associated with export production could have negative consequences on the environment, depending on the effectiveness of regulatory controls.

³³ According to FAO, the deforestation process starts when roads are cut through the forest, opening it up for logging and mining. Once the forest along the road has been cleared, commercial or subsistence farmers move in and start growing crops. But forest soils are too nutrient-poor and fragile to sustain crops for long. After two or three years, the soil is depleted. Crop yields fall. The farmers let the grass grow and move on. And the ranchers move in. Little investment is needed to start raising cattle on cheap or abandoned land where grass is already growing. And the returns can be high, at least for a while. After just five to 10 years, overgrazing and nutrient loss turn the rainforest land that was once a storehouse of biological diversity into an eroded wasteland. (http://www.fao.org/ag/againfo/resources/documents/policies/03/EN/AGA04_EN_05.pdf). After this period, lands are sold or rented to farmers growing soybeans and grains (Barreto, 2006)

In the EU, liberalization will reinforce specialization of the regions. Beef production will tend to concentrate in regions where the costs of production are the lowest, while agriculture in other regions will tend to move to different products. Both positive and negative environmental impacts could occur. Some land may go out of production, allowing a rise in semi-natural habitat. However, cattle breeding plays an important role in land fertilization in crop cultivation regions. Farmers in regions where beef production declines would expand their use of other fertilisers with greater environmental impacts. With relatively strong regulation, the effects are not expected to be large.

Taking into account increased production in Mercosur and decreased production in the EU, the overall impact on greenhouse gas emissions is expected to be relatively neutral, except for the adverse effect of increased international transport and a small increase in overall production. The CETM results for overall carbon emissions support this. The production movements between different agricultural sectors with different emissions will be similar but in opposite directions in EU and Mercosur.