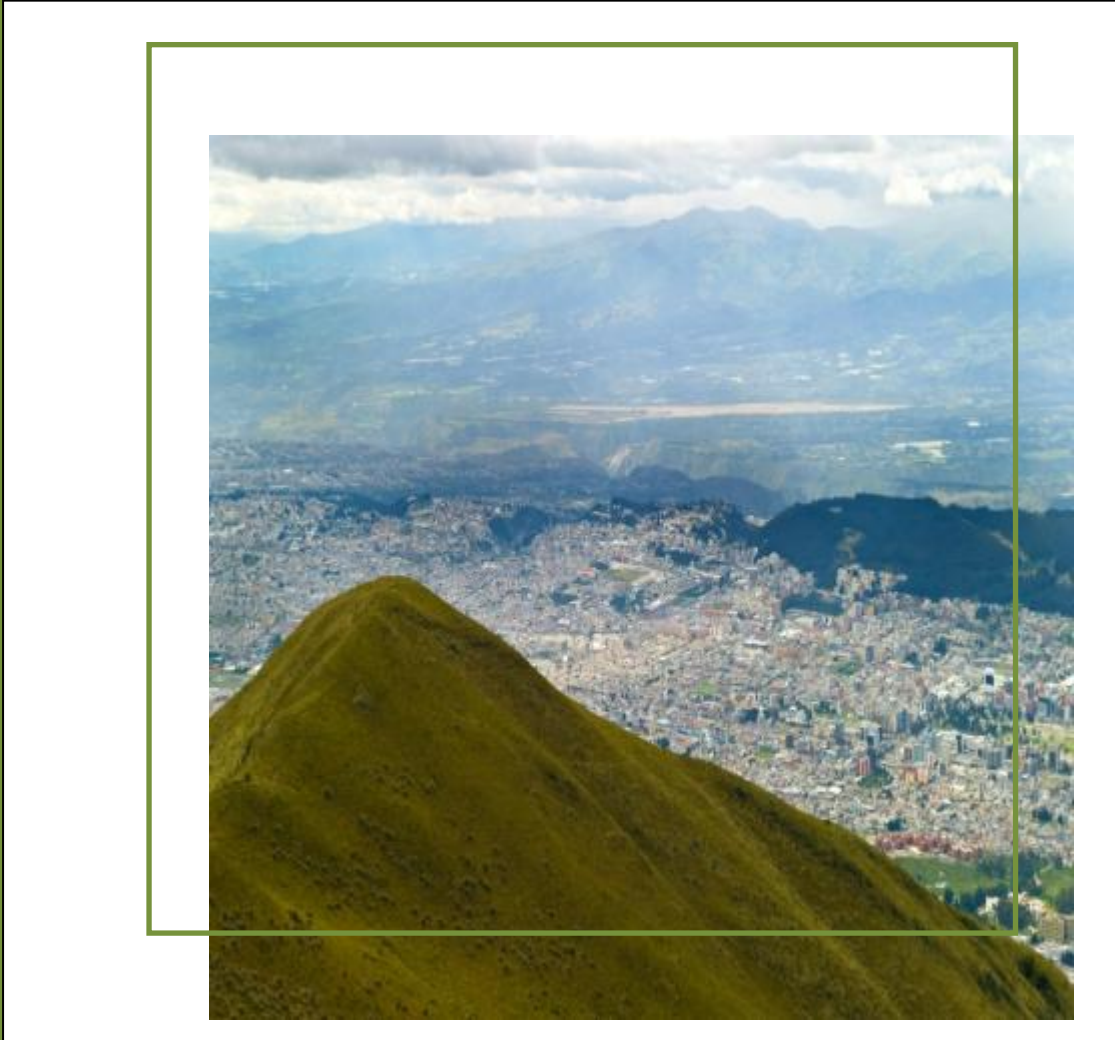




A project financed by:  
European Commission  
DG Trade

# EU-Andean Trade Sustainability Impact Assessment



**Draft Interim Technical  
Report**

May 2009





A project financed by:  
**European Commission**  
**DG Trade**

# EU-Andean Trade Sustainability Impact Assessment

## **DRAFT INTERIM TECHNICAL REPORT**

**MAY 2009**

Implemented by:



This report was commissioned and financed by the Commission of the European Communities. The views expressed herein are those of the Consultant, and do not represent any official view of the Commission.



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## EXECUTIVE SUMMARY

The objective of this Draft Interim Sustainability Impact Assessment report is to provide an initial assessment of the likely economic, environmental and social impacts of an EU-Andean trade agreement. The assessment covers the four Andean countries of Bolivia, Colombia, Ecuador and Peru. Although Bolivia is not an official party to the trade negotiations with the EU, Bolivia is included in the report for analysis.

The preliminary assessment findings presented in this report form the basis for further consultation with the project steering committee and members of civil society in the Andean countries and the European Union. The results will be combined with the findings of the investigations undertaken by local teams in the Andean countries to undertake deeper analysis in the final phase of the study and to provide the basis for the analysis of preventative, mitigation and enhancement measures.

There are **six** sections to this report. **Section one** of this report outlines the **background** to the EU-Andean trade SIA and provides an overview of the **study methodology**. The methodology is based on the *Handbook for Trade SIAs*.

The EU-Andean SIA uses a multi-region computable general equilibrium model to measure the static and long run dynamic effects of two potential liberalisation scenarios:

- Scenario 1:           **'Modest liberalisation'**  
90% reduction of tariffs, 50% liberalisation of services, 1% reduction of trade transaction costs.
  
- Scenario 2:           **'Ambitious liberalisation'**  
97% reduction of tariffs, 75% liberalisation of services, 3% reduction of trade transaction costs.

**Section two** analyses the **baseline conditions** in the Andean Countries. The baseline scenario serves to describe the likely economic, social and environmental effects in the absence of a bilateral trade agreement between the EU and its respective partners, and identifies the major economic and social implications (including poverty, gender impacts, potential changes in wage and unemployment, and adjustment costs) as well as environmental effects.

The baseline scenario takes into account existing WTO commitments of each country or region under consideration and to what extent these commitments have been implemented. Section two also describes the existing **regulatory framework** as it affects economic, environmental and social outcomes.

Building on the baseline and broad macroeconomic analysis results, **Section three** provides the interim sustainability assessment. This section examines the dynamic effects of trade liberalisation on four sectors of strategic importance using nine core indicators of economic, social and

environmental sustainability: Real income, fixed capital formation, employment, biodiversity, environmental quality, natural resource stocks, poverty, equity and health and education.

**Section four** of this report outlines project consultation activities with the network of SIA stakeholders from civil society, including past and future consultation workshops, email correspondence, the SIA website and newsletters.

**Section five** contains references used in the report and **section six** contains technical annexes.

Key findings of the Draft Interim Technical Report includes:

**Macro analysis** At the macro level, short run and long run analysis of both scenarios indicate that by 2018, **a trade liberalising agreement between the EU and Andean countries would result in a net increase in GDP of between 0.2 and 2.1 per cent across the four Andean countries** (Bolivia, Colombia, Ecuador and Peru). In contrast, there will be no measureable change in the EU.

**Agriculture and processed agricultural products** Agriculture and other primary products (excluding mineral fuels and oils) represent more than fifty per cent of exports from Andean countries to the European Union. Major products include bananas, coffee, nuts, copper, iron and steel. On average, agriculture contributes to 10 per cent of GDP in Andean countries and between 8 per cent (Ecuador) and 40 per cent (Bolivia) of employment.

The results of long-run ‘ambitious’ scenario modelling predicts mixed results across the agriculture and mining sub-sectors. Primary mining and horticulture (edible fruits, nuts and vegetables) are the two sub-sectors expected to increase production across *all four* Andean countries as a result of the proposed trade agreement.

While this may have positive social and economical impacts in terms of rural employment and incomes, increased mono-culture production, land clearing and chemical use pose environmental risks to Andean biodiversity. Output of grains, forestry, fisheries and processed food and beverages will see both declines and increases according to the individual Andean country.

**Industrial products** The industrial sector accounts for approximately one third of GDP in Andean countries and between 18.8 and 23.8 per cent of employment. Exports of industrial manufactured goods to the EU represent 10 per cent of total exports. Imports from EU-27 Member States are mainly high value machinery, vehicles, chemicals and pharmaceuticals.

The interim modelling indicates that by 2018, output of light-industrial goods (textiles, clothing, leather products) will generally increase among Andean countries as a result of trade liberalisation. In particular, output of textiles and leather goods in Bolivia is predicted to increase by 20 per cent and 7 per cent respectively.



Output of heavy-industrial goods (motor vehicles and transport equipment, machinery and electronics) will increase *on average* over all the Andean countries, with declines in certain sub-sectors in some countries (eg. motor vehicle output is predicted to fall by 24 per cent in Ecuador). This overall net increase in industrial production is predicted to raise both skilled and unskilled wages in the Andean countries by up to 1.3 per cent. Industrial air and water pollution will also increase correspondingly unless mitigated by regulation or technology.

**Services**

The services sector, including tourism, is the most economically important sector in the Andean countries, accounting for more than 50 per cent of the combined Andean GDP. Among individual countries, the sector employs between 42 and 72 per cent of the workforce.

As barriers to trade in services are difficult to quantify, modelling the potential impacts of trade liberalisation can be unreliable. Based on estimates of non-tariff barriers to the services trade of between 24 and 30 per cent in the Andean countries, an ambitious scenario would result in general decreases in the output of the financial, insurance, business and recreation services sub-sectors. Output in the utilities, construction, distribution and communication sub-sectors is predicted to increase in most Andean countries.

It is estimated that controlled opening up of the services sector to foreign competition under an EU- Andean trade agreement may lead to improved social welfare outcomes for the poor and greater resource use efficiency in the environment.

**Other trade areas under negotiation**

An **investment** agreement with the EU is expected to have a positive impact on inbound capital flow and long term employment trends for Andean countries, with associated flow on social benefits (tax revenue, training). While improved openness and transparency in **public procurement** in Andean countries is considered to bring positive economic benefits, there remains insufficient data to support this assertion. As Andean countries are shown to have some of the highest trade costs in the world, enhanced measures on **trade facilitation** are expected to improve business efficiency and facilitate growth and investment.



## 1. INTRODUCTION

### 1.1 EU Andean Trade SIA

Negotiations between the EU and the Andean Community for a region-to-region association agreement, including political dialogue, cooperation and trade, were launched in June 2007, but were suspended in June 2008 after disagreement between Andean countries on approaches to a number of key trade issues. New negotiations for a multiparty trade agreement were launched in January 2009 between the EU and Colombia, Ecuador and Peru. This trade agreement will provide for progressive and reciprocal liberalisation of goods and services by means of a free trade area compliant with the rules and obligations of the WTO, and establish common disciplines in all trade related areas.

The EU is committed to supporting regional integration in the Andean Community through its trade related technical assistance in the region, including institutional support to the Secretariat of the Community of Andean Nations (CAN) and capacity building for the development of common policies. The EC's current Regional Strategy Paper for the Andean Community, covering the period 2007-2013, identifies three focal sectors for cooperation activities at CAN sub-regional level: to assist the Andean Community to strengthen its economic integration, thereby giving it a stronger position in the world economy; to support initiatives to enhance social and economic cohesion within the Andean Community; and to assist the Andean countries in their difficult fight against illicit drugs, in line with the principle of shared responsibility that governs EU-Andean relations in this area.<sup>1</sup>

The European Commission has been engaged in conducting Trade SIAs as part of its trade policy-making process since 1999. The purpose of the Trade SIA programme is to inform trade negotiators and other interested parties on the potential economic, social and environmental impacts of the EU's trade negotiations, in both the EU and Europe's trading partners. The SIA programme is also intended to make proposals on preventing, enhancing and mitigation measures to maximise positive effects arising from a trade agreement and minimise negative ones.

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<sup>1</sup> EC, 2007

The European Commission has defined the objective of its SIA studies (European Commission, 2002) as a means of integrating sustainability into European trade policy:

- by analysing the issues of a trade negotiation with respect to sustainable development;
- by informing negotiators of the possible social, environmental, and economic consequences of a trade agreement; and
- by providing guidelines to help in the design of possible flanking measures, the sphere of activity of which can exceed the commercial field (internal policy, capacity building, international regulation), and which makes it possible to maximise the positive impact and to reduce the negative impact of the trade negotiations in question.

The Trade SIA programme applies a standard approach in conducting the assessment. This framework has two complementary elements:

- Trade sustainability impact assessment, comprising a balanced and integrated assessment of potential economic, social and environmental impacts.
- Consultation process, whereby consultation with, and dissemination of results to, partners and key stakeholders is an integral part of the assessment process. Consultation and transparency are essential processes for ensuring the credibility and legitimacy of the Trade SIA.

The objective of the EU-Andean SIA programme is to assess what impact a multi-party trade agreement could affect sustainable development in the EU and the Andean countries. The first stage of the project involved the preparation of the Inception Report, available on the project website, which outlined how the research and consultation of the Trade SIA will be carried out.

This Draft Interim Technical Report represents the mid-way point of the project's research and consultations. The qualitative impact research on the scenarios developed for the assessment, in preparation for civil society consultation in both the EU and Andean countries, reviews current environmental, social, economic and trade characteristics and trends. It also reviews the interim findings of the project consortium's research on the likely impacts of the proposed trade agreement. These findings will be reviewed at a local workshop in Lima, Peru on 26 May 2009 and at a second civil society meeting in Brussels. Feedback from these events, and comments received via the website, will be incorporated into the final report, which will propose measures for avoiding, preventing or mitigating adverse impacts and enhancing beneficial ones.

## 1.2 Methodology of the EU-Andean Trade SIA

Trade SIAs are based on the analysis of a causal chain which identifies the significant cause-effect link between a proposed change in trade policy and its economic, social (including gender and poverty), and environmental impacts. This analysis should as far as possible combine qualitative and quantitative approaches, use sustainability indicators and be based on the principle of proportionate analysis. Primarily, the analysis focuses on the core indicators identified in the EC Trade SIA Handbook<sup>2</sup>. In addition and where data are available, indicators used in the assessment covers aspects of quality in work and decent work and Millennium Development Goals (MDG) according to the various themes used in a Trade SIA study.

The models to be used build on the latest developments in trade modelling in areas of goods and services trade, and are able to analyse dynamic effects, short and long term implications; imperfect competition; heterogeneous households; and with social and environmental indicators inclusive where required. The modelling methodology builds on those used in previous Trade SIAs, and focuses on quantitative economic (and, where possible, social and environmental) factors and outputs. Where discrete data is not available, qualitative sources relating to, for example, labour conditions, impacts on quality of health, biodiversity, water quality impacts and other economic issues such as regulatory and non-tariff barriers will be used to derive indirect measures. Application of a multi-region computable general equilibrium (CGE) model is used to derive the core economic impacts of the proposed multi-party trade agreement. These scenarios have been developed in consultation with the EC.

Results from the quantitative equilibrium modelling identify the expected magnitude of the increase or decrease in production in each economic sector. In turn, this provides the basis for the environmental and social assessment of liberalisation of trade in agricultural, non-agricultural products, services and other trade related areas. The results obtained from the economic analysis will be used in conjunction with information on the regulatory regime. The latter is important since the impact of social and environmental regulation has a significant influence on how economic changes in turn affect social and environment issues.

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<sup>2</sup> [http://trade.ec.europa.eu/doclib/docs/2006/march/tradoc\\_127974.pdf](http://trade.ec.europa.eu/doclib/docs/2006/march/tradoc_127974.pdf)

**PROJECT WEBSITE AND FEEDBACK**

Feedback and comments on the Draft Interim Technical Report and on the project in general can be sent to [enquiries@euandean-sia.org](mailto:enquiries@euandean-sia.org)

Information regarding the project and access to project documents is available at [www.euandean-sia.org](http://www.euandean-sia.org).

## 2. BASELINE CONDITIONS

### 2.1 Introduction

Baseline conditions are used in the sustainability impact assessment to provide the 'business as usual' assessment scenario.

The nine core sustainability indicators are used in the analysis of the baseline conditions in Andean countries. Where necessary, the methodology allows for the use of additional second tier indicators, to provide a more detailed measurement of sustainability impacts. In addition to the core sustainability indicators, the methodology allows for the use of additional second tier indicators which can provide a more detailed measure of sustainability impact.

<b>Table 1 Core Sustainability Indicators</b>	
<b>Sustainability dimension</b>	<b>Core indicator</b>
Economic	Real income Fixed capital formation Employment
Environmental	Biodiversity Environmental quality Natural resource stocks
Social	Poverty Equity Health and education

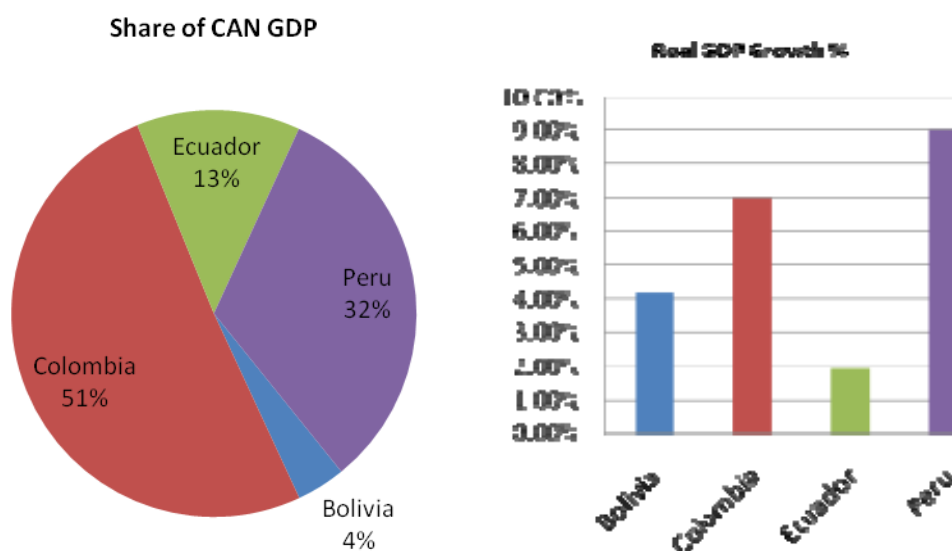
## 2.2 Baseline Economic Conditions

### 2.2.1 Real Income

After a period of economic crisis and decline beginning at the end of the 1990s, the economies of the Andean countries recovered in 2004, recording growth in GDP between 4.9% and 6.8%<sup>3</sup> and progress in practically all the principal economic indicators: investment, domestic savings, employment, trade balance, inflation and external debt.

In 2007 the Andean countries combined GDP totalled approximately €222 billion. Divergence between aggregate GDP levels between individual countries is much greater, with Colombia accounting for the majority of total output, as revealed in figure 1.

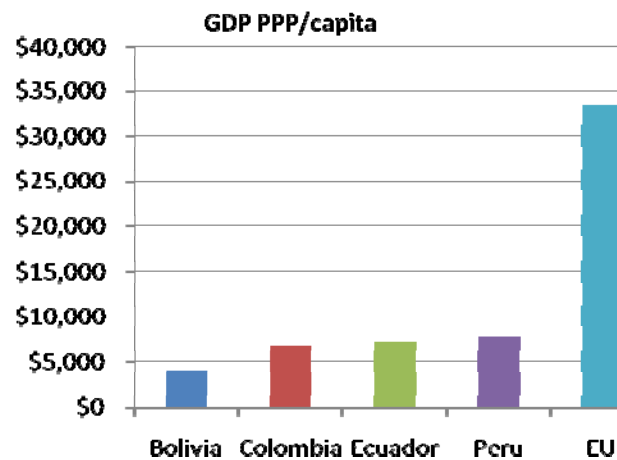
**Figure 1: 2007 Andean countries GDP Share and Real Growth Rate by Member**



Bolivia has the most marginal economic impact of the group, despite having a labour force roughly equal to that of Peru in size (4.38 million versus 4.51 million, 2007). Bolivia's position as the least developed of the group is contributed by its landlocked status.

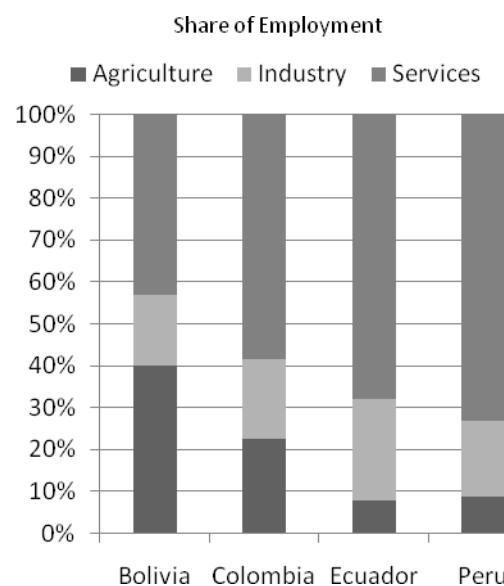
<sup>3</sup> EU Trade with the Andean Community, European Commission DG Trade, 1 August 2008



**Figure 2: Andean countries – Per Capita GDP (PPP, 2007)**

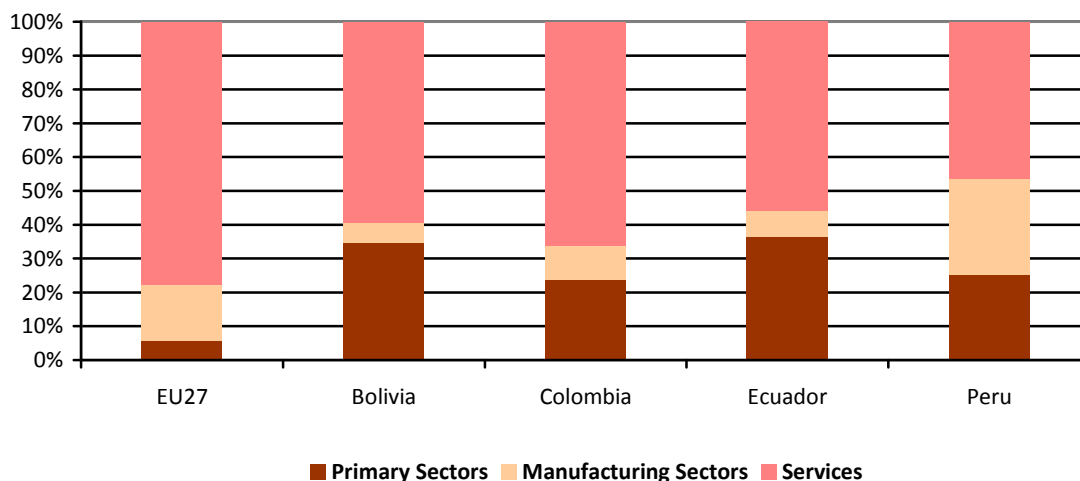
GDP per capita figures provide a further means of identifying characteristics of the regional economic picture. As revealed in figure 2, Peruvians enjoy the highest relative living standards, while Bolivians are the poorest, even when the purchasing power parity method is applied.

In terms of sector breakdown, matching its status as the poorest of the Andean member countries, Bolivia's economic dependence on agricultural is the highest, with 14% of output and 40% of employment from that sector (see figure 3). In the rest of the region, on average, agriculture contributes 10%, with the share of total employment in the sector, ranging from 8% to 22%. Peru has the largest level of employment in the services sector, possibly most influenced by its large tourism industry.

**Figure 3: Labour Employment by Economic Sector**

The aggregate production structure for the Andean countries and the EU is summarised in figure 4 below. As can be seen from the chart, roughly three quarters of the EU's value added is attributable to the service sectors and less than 20 percent to manufacturing. Production in the primary sectors accounts for about 5 per cent of total European production.

**Figure 4 - Share of production in the Andean countries and EU27 by sector (2004)**



Source: GTAP database, version 7.

For the Andean countries, a smaller share of production is attributable to services. Meanwhile, between one third and one fourth of overall production is attributable to the primary sectors.

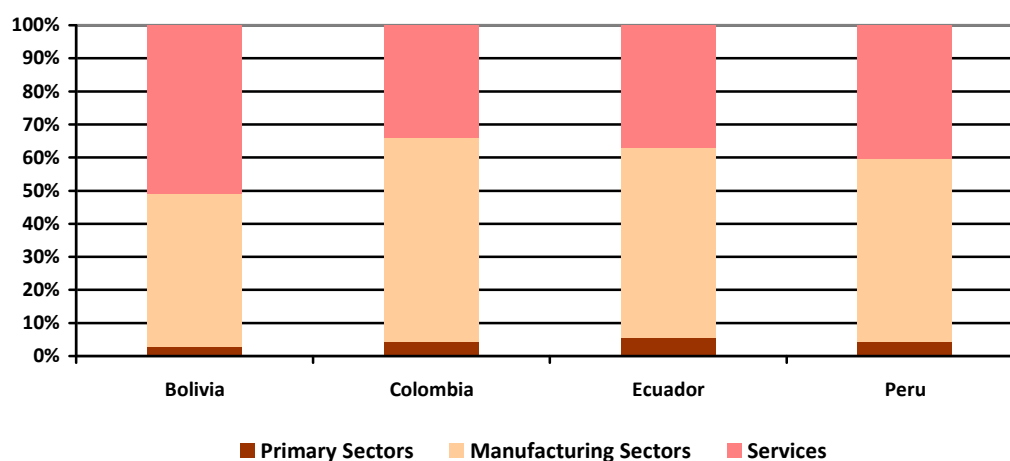
### 2.2.2 Trade

Patterns of trade between the EU and Andean countries reveal significant growth during the past decade - bilateral flows have increased from €9.1 billion in 2000 to €15.8 billion by 2007, at an average annual growth rate of 8.25%. The EU is the Andean countries' second most important trade partner behind the United States, accounting for 14.2 per cent of total trade in 2007. In contrast, Andean countries accounts for 0.6 per cent of EU total trade, or approximately €10 billion of Extra EU trade

Fifty per cent of total trade between the EU and the Andean countries is between the EU and Colombia trade. Peru accounts for 27 percent, Ecuador for 19 and the remaining 5 per cent is EU-Bolivia trade. The shares of trade closely follow each country's share of Andean GDP, which implies similar shares of European trade per GDP across the Andean countries.

A high share of bilateral trade consist of services. This is more an indication of the overall low levels of trade in goods taking place, rather than an implication of services trade being important in bilateral trade. For example, a large share of Andean exports of services contains tourism from the EU.

**Figure 5 - Share of EU exports to the Andean countries by sector (2004)**



Source: GTAP database, version 7

Andean goods and services imports from the EU is largely concentrated in four sectors: namely chemicals, rubber and plastic (17 per cent of imports), machinery (18 per cent), business services (11 per cent) and air transport (seven per cent).

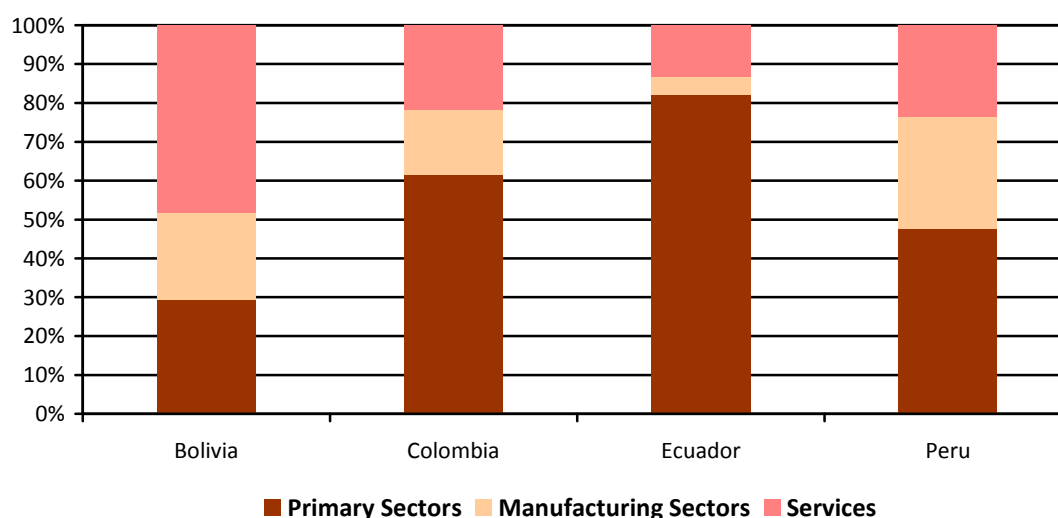
Table 2 shows the share and composition of EU exports to Andean countries. Manufactures dominate Europe's exports to Andean countries, accounting for three quarters of all exports.

<b>Table 2: EU goods exports to Andean countries 2003 - 2007</b>						
<b>STIC Rev.3</b>	<b>2003</b>	<b>%</b>	<b>2005</b>	<b>%</b>	<b>2007</b>	<b>%</b>
<b>TOTAL</b>	3,891	100	4,612	100	5,786	100
<b>Primary Products</b>	299	7.7	356	7.7	453	7.8
<i>of which:</i>						
Agricultural Prod.	246	6.3	263	5.7	299	5.2
Energy	9	0.2	12	0.3	42	0.7
<b>Manuf. Products</b>	3,453	88.7	4,079	88.4	4,347	75.1
<i>of which</i>						
Machinery	1,217	31.3	1,769	38.4	1,654	28.6
Transport equip.	505	13.0	339	7.4	425	7.3
<i>of which:</i>						
Automotive Prod.	162	4.2	239	5.2	320	5.5
Chemicals	845	21.7	906	19.6	990	17.1
Textiles and cloth.	80	2.1	79	1.7	92	1.6

European export sectors that have maintained or increased their market share are traditional high value added industrial goods, such as machinery, electrical machinery or high tech equipment. The EU's high value added chemicals sub-sector of pharmaceutical products has notably experienced growth in its export share while organic chemicals have declined, highlighting that increasing fuel costs, and thus the cost of shipping relatively heavy commodity liquids, has increased.

<b>Table 3: EU goods exports to Andean countries by commodity group, 2007</b>		
<b>Products (SITIC sections) by order of importance</b>	<b>Mio Euro</b>	<b>%</b>
<b>Total</b>	<b>5.786</b>	<b>100,0</b>
Machinery and transport equipment	2.091	36,1
Chemicals and related prod., n.e.s.	990	17,1
Manufactured goods	842	14,6
Miscellaneous manufactured articles	456	7,9
Food and live animals	166	2,9
Crude materials inedible, except fuels	105	1,8
Beverages and tobacco	92	1,6
Commodities and transactions n.e.c.	80	1,4
Mineral fuels, lubricants and rel. materials	42	0,7
Animal and vegetable oils, fats and waxes	15	0,3

**Figure 6 - Share of EU imports from Andean countries by sector (2004)**



Source: GTAP database, version 7.

EU imports of goods from the Andean countries is largely concentrated in goods originating in the primary sector. Across all countries, nineteen percent of imports consist of Vegetables, Fruits and Nuts. This sector accounts for close to fifty percent of imports from Ecuador. Mining accounts for 18 per cent of goods imported from Andean countries, with 25 per cent of imports from Colombia coming from this sector.

Table 4 shows the composition and share of EU imports from the Andean countries. Primary products account for 85 per cent of all imports.

<b>STIC Rev.3 Product Groups</b>	<b>2003</b>	<b>%</b>	<b>2005</b>	<b>%</b>	<b>2007</b>	<b>%</b>
<b>TOTAL</b>	6,094	100	7.41	100	10,255	100
<b>Primary Products</b>	4,452	73	6,643	89.6	8,783	85.6
<i>of which:</i>						
Agricultural Prod.	3,074	50.4	3,973	53.1	4,328	42.2
Energy	782	12.8	1.3	17.5	1,675	16.3
<b>Manuf. Products</b>	751	12.3	742	10.0	1,048	10.2
<i>of which:</i>						
Machinery	87	1.4	47	0.6	34	0.3
Transport equip.	92	1.5	17	0.2	5	0.1
<i>of which:</i>						
Automotive Prod.	1	0.0	1	0.0	1	0.0
Chemicals	89	1.5	94	1.3	155	1.5
Textiles and cloth.	133	2.2	155	2.1	165	1.6

Source: DG Trade website

<b>Products (SITIC Sections) by order of importance</b>	<b>Mio euro</b>	<b>%</b>
<b>TOTAL</b>	<b>10,255</b>	<b>100,0</b>
Food and live animals	4,017	39.2
Crude materials inedible, except fuels	1,764	17.2
Manufactured goods	1,747	17.0
Mineral Fuels, lubricants and related materials	1,675	16.3
Animal and vegetable oils, fats and waxes	226	2.2
Misc. manufactured articles	182	1.8
Chemicals and related prod., n.e.s.	155	1.5
Machinery and transport equipment	40	0.4
Beverages and tobacco	25	0.2
Commodities and transactions n.e.c.	15	0.1

Tables 3 and 5 reveal the product groupings that are most important to the EU and Andean countries trading relationship: natural resources including mineral fuels, ores, slag and ash and copper have maintained a strong proportion of Andean exports over this period, while other traditionally strong sectors, such as fruits, coffee and pearls and precious metals have seen their relative share of trade decline, in some cases significantly.

### 2.2.3 Fixed Capital Formation

With the exception of Bolivia, the share of fixed capital formation in GDP has risen since 2000 in the Andean countries (table 6). This increase in investment has allowed capital formation to make a stronger contribution to growth during the most recent growth period.

	2000	2005	2007
<b>Bolivia</b>	18	14	15
<b>Colombia</b>	16	22	24
<b>Ecuador</b>	20	24	24
<b>Peru</b>	20	18	23

There are significant differences in the total volume of foreign investment inflows to the Andean countries, in part reflecting the differences in GDP. Table 7 shows the annual inflows of FDI over the period 2005-07.

	2005	2006	2007
<b>Bolivia</b>	-288	281	204
<b>Colombia</b>	10,240	6,464	9,028
<b>Ecuador</b>	493	271	178
<b>Peru</b>	2579	3467	5343
<b>South America</b>	44,305	43,102	71,699

Source: UNCTAD, 2008

Table 8 shows similar cross country variation in the contribution that FDI makes to total gross fixed capital formation.

	2005	2006	2007
<b>Bolivia</b>	23.2	17.2	9.6
<b>Colombia</b>	41.8	21.5	22.9
<b>Ecuador</b>	6.0	3.0	1.8
<b>Peru</b>	17.7	19.4	22.8
<b>South America</b>	16.0	13.1	15.4

Source: UNCTAD 2008

The differences in the contribution and volume of FDI shown in tables 9 and 10 reflects in part, the differences in policy towards FDI in each of the Andean countries. After a decade of liberalisation and market opening for FDI in the 1990s, the present decade has seen divergent policies adopted towards FDI and integration with the global economy. These differences are particularly evident in the hydrocarbon sector.

In Ecuador, oil and natural gas exports are an important source of foreign exchange accounting for more than 40% of export earnings and approximately half of public sector proceeds.<sup>4</sup> A new hydrocarbons law of 2006 increased the share of revenue accruing to the Government from oil and gas projects, prompting a series of contract renegotiations and disputes.

In Bolivia, natural gas provided an average of 34% of current revenue during the past decade.<sup>5</sup> In contrast to the liberalisation era of the 1990s, Bolivia introduced new restrictions on foreign ownership in 2006. Discussions relating to ownership and fiscal arrangements in the oil and gas industry were resolved by the signing of new service contracts which substantially raised the Government's revenues from production and returned ownership of all reserves to the State oil company.<sup>6</sup>

In Peru, income taxes from the mining industry have increased dramatically in recent years in line with metal price increase. Between 2000 and 2006, the annual income tax revenue from mining companies rose from 10% to 42% of total government revenue. During the same period the annual income tax revenue from the oil and gas industry rose from \$35 million to \$296 million, corresponding to 5%-7% of total government revenue.<sup>7</sup> The mining industry employed over 100,000 people in 2006, accounting for less than 1% of the working population of the country.<sup>8</sup>

Colombia has substantial mineral reserves including one of the world's largest deposits of oil discovered in recent years (Cusiana fields), one of the world's largest open coal mines and significant deposits of emeralds, nickel and natural gas. In 2007, the extractive industries attracted more than half the total FDI inflows. Foreign investment in oil and gas increased by 90% , totalling \$3.4billion.<sup>9</sup> In contrast to other Andean countries, Colombia has legislated for greater foreign participation in the oil and gas industry, and in 2007 announced a plan to sell 20% of the shares on the State oil company, Ecopetrol.<sup>10</sup>

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<sup>4</sup> Stanley 2008

<sup>5</sup> Stanley, 2008

<sup>6</sup> UNCTAD 2007

<sup>7</sup> UNCTAD, 2007

<sup>8</sup> UNCTAD 2007

<sup>9</sup> UNCTAD 2008

<sup>10</sup> UNCTAD 2008



## 2.3 Baseline Social Conditions

### 2.3.1 Poverty

Although poverty and indigence rates have decreased in the Latin American region in the last decade<sup>11</sup> poverty indicators are still significantly high in Andean countries. As a result of the current world financial crisis, it is expected that poverty indicators will deteriorate further, as a result of the rise in food prices, increasing rates of urban unemployment<sup>12</sup> and weak (or lack of) social protection schemes in most low-income countries. It is predicted that the crisis will particularly affect poor households whose income and livelihood strategies are based on the informal sector.<sup>13</sup> It is also expected that women will be among the more vulnerable to the labour market downturn cycle.

Country a/	National	Urban	Rural
<b>Bolivia (2007)</b>	54.0	42.4	75.8
<b>Colombia (2005)</b>	46.8	45.4	50.5
<b>Ecuador (2007)</b>	42.6	38.8	50.0
<b>Peru (2006)</b>	44.5	31.2	69.3

a/ Years are between parentheses.

Source: Based on ECLAC (Statistics and Economic Projections Division, Social Statistics Unit, based on special tabulations of the respective country's household survey data).

Poverty is also a segmented phenomenon. Women and child poverty are recurrent problems across Andean countries. As shown in Figure 7, from the early 1990s, until the beginning of the current decade, child poverty increased more than 2 percent in Ecuador and Bolivia, whilst it decreased in Peru. Furthermore, in all countries over half of all children below the relative poverty line live in families which do not meet their basic needs. High income inequality and late demographic transition would be among the significant factors that explain this pattern.<sup>14</sup>

<sup>11</sup> ECLAC, 2008

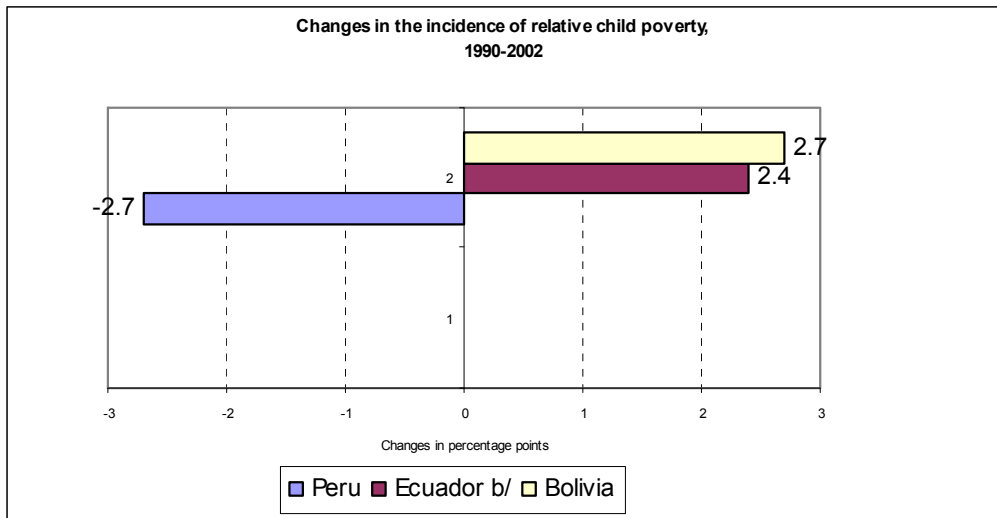
<sup>12</sup> See also

[www.eclac.cl/cgi-bin/getProd.asp?xml=/prensa/noticias/comunicados/7/34747/P34747.xml&xsl=/prensa/tpl/p6f.xsl&base=/tpl/top-bottom.xsl](http://www.eclac.cl/cgi-bin/getProd.asp?xml=/prensa/noticias/comunicados/7/34747/P34747.xml&xsl=/prensa/tpl/p6f.xsl&base=/tpl/top-bottom.xsl)

<sup>13</sup> ECLAC (2008)

<sup>14</sup> UNICEF, 2005. Reduction in relative child poverty did not imply absolute child poverty reduction.

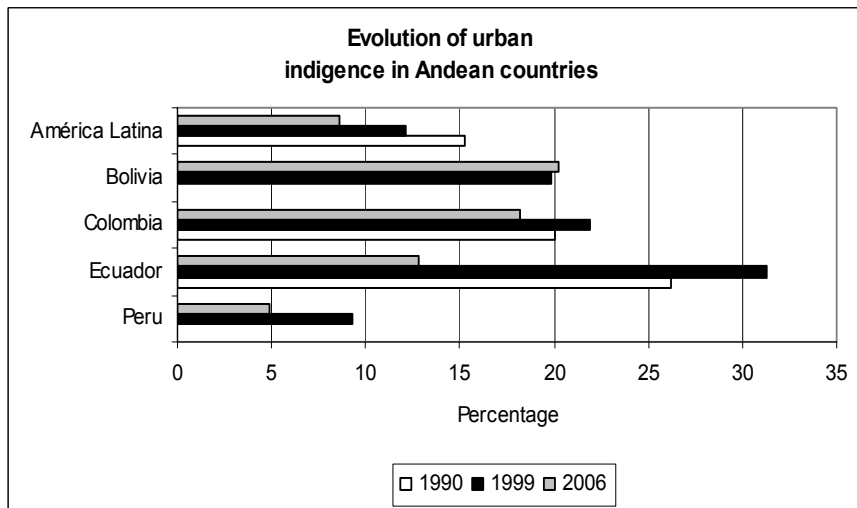
**Figure 7**



Based on UNICEF data. (No information available for Colombia).

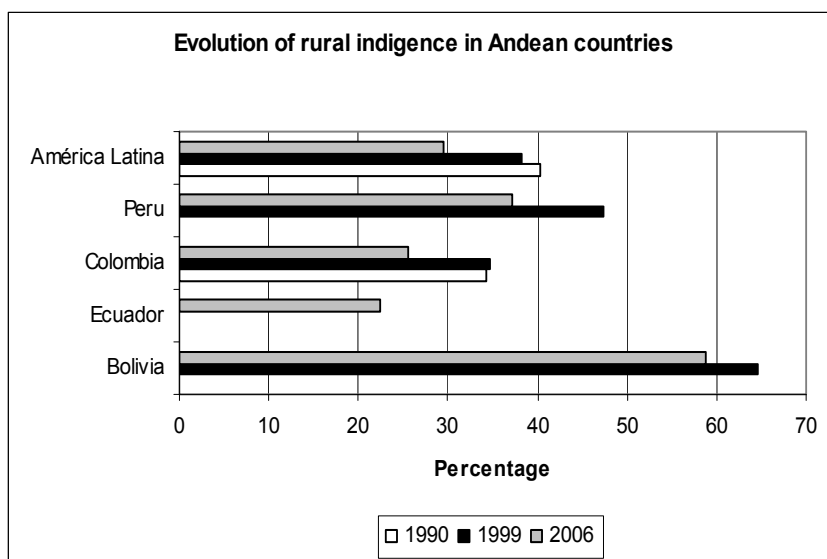
Extreme poverty tends to be concentrated in rural areas and indigenous groups. Indeed, as shown in Figures 8 and 9, the incidence of extreme poverty is significantly higher in rural areas, especially in areas with a concentration of indigenous groups.

**Figure 8**



Source: Based on ECLAC data.

Figure 9



Source: Based on ECLAC data.

It is also important to highlight that the increased mobility of poor populations across urban and rural spaces and the deployment of combined livelihood strategies<sup>15</sup>, combined with high rates of urbanisation, make it difficult to clearly identify *who* the *rural* and the *urban* poor are. This includes data on where they settle down, what their livelihood strategies are, and how they can be reached more efficiently with public policies and programmes.

The territorial dynamics that one can observe in Andean countries is notoriously uneven. There are some territories which show processes of growth, poverty reduction and social inclusion. However, next to successful cases there are situations in which every indicator of development is changing in the opposite direction, whereby the local economy is stagnant, people are leaving due to lack of opportunities, poverty is widespread, governability is weak and sustainability is seriously threatened. In between there are territories in which the dynamics of development show mixed outcomes.<sup>16</sup>

<sup>15</sup> See at this respect Hinojosa (2009), Escobal (2001), and Reardon and others (2001).

<sup>16</sup> Annex 2 provides detailed information on the territorial dynamics of poverty in the Andean Community countries.

### 2.3.2 Inequality

One of the striking features of Latin American countries is the widespread inequality observed in terms of income, poverty rates and most related social indicators (for instance, access to health and education services). Table 10 shows the disparities observed of income distribution.

Country	National	Urban	Rural
<b>Bolivia (2001)</b>	0.335	0.341	0.328
<b>Colombia (2005)</b>	0.584	0.587	0.495
<b>Ecuador (2007)</b>	0.531	0.513	0.469
<b>Peru (2005)</b>	0.430	n.d.	n.d.

Notes:

-Years of reference are between parentheses.

- n.d. means no data.

Source: Based on ECLAC (Statistics and Economic Projections Division, Social Statistics Unit, based on special tabulations of the respective country's household survey data), UDAPE (2006), Escobal and Ponce (2008).

A higher number represents a narrower distribution of income among the total population..

### 2.3.3 Health and Education

National health conditions indicators in Andean countries (shown in Table 11 and 12) suggest that health standards are relatively low when compared to higher income countries in Latin America and the developed world.

	Adult mortality rate a/	Incidence of tuberculosis (per 100000 population per year)	Life expectancy at birth (years)	Life expectancy at birth (years) female	Life expectancy at birth (years) male	Maternal mortality ratio (per 100 000 live births)	Prevalence of tuberculosis (per 100 000 population)
<b>Bolivia</b>	208	198	66	67	64	290	266
<b>Colombia</b>	131	45	74	78	71	130	59
<b>Ecuador</b>	166	128	73	76	70	210	195
<b>Peru</b>	136	162	73	75	71	240	187

Notes:

a/ probability of dying between 15 to 60 years per 1000 population

Source: World Health Organisation (WHOSYS)

**Table 12: Selected indicators on health conditions of children (2006 or latest available year)**

	Deaths among children under five years of age due to diarrhoeal diseases (%)	Infant mortality rate (per 1 000 live births) both sexes	Infant mortality rate (per 1 000 live births) female	Infant mortality rate (per 1 000 live births) male	Children under five years of age stunted for age (%)	Children under five years of age underweight for age (%)
<b>Bolivia</b>	14.3	50	47	52	32.5	5.9
<b>Colombia</b>	10.3	17	14	20	16.2	5.1
<b>Ecuador</b>	11.0	21	18	23	29.0	6.2
<b>Peru</b>	12.2	21	20	23	31.3	5.2

Source: World Health Organisation (WHOSYS)

Rural populations in Andean countries are affected by a number of infectious diseases, which in turn have impacts on poverty. The more recurrent are malaria, tuberculosis and dengue.

According to the WHO, the incidence of these illnesses is higher in Colombia and Bolivia, followed by Peru. Malaria affects on average at least 2 out of 1000 people in Colombia, Bolivia and Peru. Dengue affects rural population in a range of 20 to almost 80 people (per 100,000) and tuberculosis approximately 20 (per 100,000).

Access to social services is segmented by sex and geography. Education still privileges men, and rural areas continue to show lower standards of both education and health. Such a situation explains, at least in part, the high percentages of adolescent fertility rates (100% in Ecuador, 97% in Bolivia, 92% in Colombia and 59% in Peru) which, in combination with women's lower access to education, constrains the opportunities for women to integrate into labour markets. (See tables 13 and 14).

**Table 13: Births attended by skilled health personnel (%)**

	National average	Lowest wealth quintile	Rural	Urban
<b>Bolivia</b>	61	34.4	38.6	77.7
<b>Colombia</b>	96	72	76.8	97.1
<b>Ecuador</b>	80	n.d.	n.d.	n.d.
<b>Peru</b>	73	13	25.3	84.6

Source: World Health Organisation (WHOSYS)

On average, however, education levels in Andean countries are relatively high. Since the 1980s, access to primary education has improved significantly. The two main concerning issues relate to access to secondary and higher education, and the quality of education services. Whilst men from urban areas are among those who have more access to secondary education, in rural areas the situation is almost similar for men and women. In either case, the quality of public education in rural areas is notably low.

	<b>Adult literacy rate (%)</b>	<b>Net primary school enrolment ratio female (%)</b>	<b>Net primary school enrolment ratio male (%)</b>
<b>Bolivia</b>	86.7	95.0	94.0
<b>Colombia</b>	92.8	88.0	89.0
<b>Ecuador</b>	91.0	97.0	96.0
<b>Peru</b>	87.9	97.0	96.0

Note: Bolivia: 2001, Colombia: 2005, Ecuador: 2001, Peru: 2005.

Source: World Health Organisation (WHOSYS)

With regards to access to water distribution public services, as well as to sanitation infrastructure, the disparities between urban and rural areas can clearly be perceived (see table 15).

	<b>Water (Rural)</b>	<b>Water (Total)</b>	<b>Water (Urban)</b>	<b>Sanitation (rural)</b>	<b>Sanitation (total)</b>	<b>Sanitation (urban)</b>
<b>Bolivia</b>	69	86	96	22	43	54
<b>Colombia</b>	77	93	99	58	78	85
<b>Ecuador</b>	91	95	98	72	84	91
<b>Peru</b>	63	84	92	36	72	85

Source: World Health Organisation (WHOSYS)

### 2.3.4 Poverty, inequality and rural livelihood strategies

In many ways, the poor in rural areas are more disadvantaged than the poor from urban areas. Studies on rural livelihoods in Latin America show that individuals and households from rural areas develop diversified strategies that combine farm, non-farm and off-farm activities (among them: agriculture, cattle grazing, food processing, hand crafting, petty commerce, wage labour in agriculture, as well as in temporary or even permanent urban employment, and so on). However, insufficient productive and social infrastructure, limited access to public services and limited access to technology reduce the opportunities for the rural population to supplement farming incomes through salaried labour. It also makes it more difficult to develop small-scale non-farm and off-farm activities, and access to local and regional markets.<sup>17</sup>

More positively, the rural poor's diversified livelihoods have produced incentives for specialisation and more efficient use of available assets. As a consequence, positive processes of decreasing poverty and local growth have been observed.<sup>18</sup> The combination of livelihood strategies among rural and urban areas implies that the rural–urban divide becomes a narrow line in regions where, under certain conditions, both agriculture and non-agricultural activities are profitable.<sup>19</sup>

The relationship between livelihood strategies and economic performance, both at the level of households and of sub national regions, depends on two important factors: the characteristics of local/regional markets and the agrarian structure.

Market characteristics that influence a farmer's economic performance include size, direct and indirect commercialisation costs and ongoing transaction costs. In regards to the agrarian structure, a farmers' ability to be part of economic growth processes and exploit commercial opportunities is differentiated by their size, the type of crops and the degree of asset concentration. Table 16 shows main features of the agriculture sectors in each of the Andean countries. Taking in account such a structure, the chances of small farmers being included in trade integration-led growth processes based on specialisation seems to be low.<sup>20</sup>

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<sup>17</sup> See, Berdegue and others (2001); Bebbington (2004); Hinojosa (2006).

<sup>18</sup> For examples of dynamic processes of growth and poverty reduction in rural areas see

<sup>19</sup> For a characterisation of main factors for the success of some livelihood strategies see FIDA (2009) and Berdegue y otros (2008).

<sup>20</sup> See, for instance, Escobal and Ponce (2007), Aramburu (2008).

**Table 16: Agrarian Structure of selected Andean countries**

Country (a/)	Main features	Size of exploitation		
		Small agriculture	Medium scale	Large scale
<b>Bolivia</b>	Land tenure (Ha)	< 50	> 50	> 2000
	Percentage of farmers	53%	47%	13%
	Main location	High plateau and valleys	Valleys	Llanos (Orient)
	Main crops	Staple food	Commercial crops (diversified)	Soy, girasol, cattle, sugar cane, maize, poultry
<b>Ecuador</b>	Land tenure (Ha)	< 5	5 to 20	> 100
	Percentage of farmers	64%	36%	2%
	Main location	Highlands		Coast
	Main crops	Potato, sugar cane, maize	Maize, potato, mora	Banana, sugar cane, African palm
<b>Peru b/</b>	Land tenure (Ha)	< 10	> 30	
	Percentage of farmers	85%	5%	
	Main location	Highlands	Coast and rainforest	
	Main crops	Staple food	Cotton, rice, sugar cane, palm	

Notes:

a/ No information available for Colombia.

b/ 24% of the 85% of small agriculture has less than 1 Ha.

Source: Based on Inurritegui and others (2008).



### 2.3.5 Employment and Decent Work

Employment in the Andean countries increased on average at a rate close to 9 percent in the period 2000-2006. Except for Peru, a common feature to the other three Andean countries is the changing sectoral structure of the employed population, with a reducing contribution of the agriculture sector and increasing contribution of industry in Bolivia and Colombia, and the services sector in Ecuador (see table 17).

<b>Table 17: Change in the structure of the total employed population, by sector of economic activity a/ (Percentage of total employed population b/)</b>								
Sectors b/	Bolivia		Colombia c/		Ecuador		Peru	
	2000	2006	2000	2006	2000	2006	2000	2006
Agriculture	36.8	32.3	22.0	20.9	28.5	29.6	32.0	37.5
Industry	19.5	21.6	19.0	19.8	20.1	18.6	14.0	13.4
Services	43.7	46.0	59.0	59.4	51.4	51.8	54.0	49.1
Total	100.0	99.9	100.0	100.1	100.0	100.0	100.0	100.0

Notes:

a/ Refers to employed population aged 15 years and over.

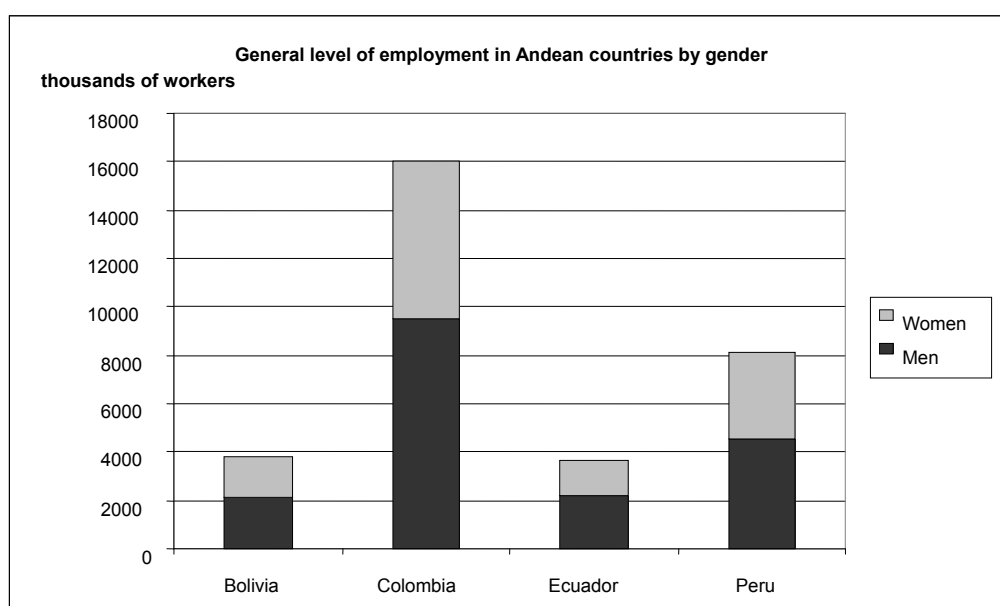
b/ In accordance with the International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 2. Data refers to the year nearest to the one heading the column.

c/ Municipality capitals for 2006.

Source: Based on ECLAC (Economic Development Division) data.

With regards to the distribution of employment by gender, access to employment has been more favourable to men than women, with differences of about 10% in access to labour markets. On average, during the period 2000 and 2007, the percentage of the male employed population in Andean countries which were men ranged between 55.7 % to 60.4 % (Figure 10).

Figure 10



Source: Based on ECLAC data.

Despite the relatively low rates of unemployment recorded in all Andean countries (see Table 18), underemployment is reported as widespread. Although the category of the informal sector is amorphous, the share of unemployment hidden in the informal parts of all economic sectors seems to be high<sup>21</sup>.

Table 18. Urban unemployment rate (ECLAC) (Average annual rate)								
Country		2000	2001	2002	2003	2004	2005	2006
Bolivia	/a	7.5	8.5	8.7	9.2	6.2	8.1	8
Colombia	/b,c	17.3	18.2	17.6	16.6	15.3	13.9	12.9
Ecuador	/a,b	9	10.4	8.6	9.8	9.7	8.5	8.1
Peru	/d	8.5	9.3	9.4	9.4	9.4	9.6	8.5

Source: Our elaboration based on ECLAC data.

Notes:

a/ Urban areas

b/ Includes hidden unemployment.

c/ Thirteen metropolitan areas.

d/ Metropolitan Lima.

<sup>21</sup> Maajid 2001

The high rates of informal employment observed for Andean countries leads to express concerns about labour standards. Particularly critical is the situation of young people and women, for whom unemployment and low labour standards are more adverse. According to ILO reports<sup>22</sup> the young population's unemployment is 'critical, dynamic and segmented.' Unemployment among young people is much higher than average unemployment overall (approximately twice of the overall unemployment rate and three times the rate for adults).

Additionally, young people account for about 50 percent of all unemployed workers in nearly every Andean country. The relationship between educational achievements and requirements in the work environment of new production patterns is changing rapidly. The ratio of young women to men in the economically-active population is changing and the reforms being made to increase labour flexibility are increasing the vulnerability of workers.

More highly-educated young people have a better employment outlook in terms of wage and working conditions. For example, while young professionals in the urban area are more often integrated into labour markets in favourable conditions, there is a large number of young people in urban and rural areas who hold insecure, low-level jobs. That segmentation is also observed by gender (with lower wages paid to women than men with the same level of education and skills).

Diversified livelihoods in the rural area also result in many economic units using low or unpaid labour from household members. Although compensation mechanisms follow family and community norms, this situation also opens space for unfair contracting practices and even exploitation. Small scale and artisanal mining in Bolivia, small agriculture in all countries, and petty commerce are the main sectors where these practices have been observed. This particularly critical situation affects women (popularly named 'palliris') who collect mine residuals in the Bolivian high plateau,<sup>23</sup> the situation of young miners in the Peruvian gold panning areas; and that of children in poor small-farm households.

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<sup>22</sup> See, for instance, Maajid 2001 and ILO 2006.

<sup>23</sup> CISEP (2005).

## 2.4 Baseline Environmental Conditions

### 2.4.1 Context

The geography of the Andean region is extremely varied. The Andes mountain range extends through seven countries, including Bolivia, Ecuador, Colombia and Peru. Produced by the subduction of the Nazca plate beneath the South American plate, the Andes form the longest mountain range in the world, and the highest outside Asia. The northern (Colombia and Ecuador) and central (Peruvian and Bolivian) Andes are wide and contain numerous plateaux and valleys. Bogotá, Quito and La Paz are all situated in these areas. The northern Andes are typically rainy and warm, and the central areas are drier. Climate within the Andean region varies according to location, altitude, and proximity to the sea. To the west of the Andes, the climate ranges from the extreme wet of the Colombian Chocó, to the extreme dry of the coastal desert strip. To the east of the Andes are extensive lowlands, typified by savanna and forest with seasonal and heavy rainfall respectively.

The varied geography and climate of the Andean region is reflected by a high level of environmental heterogeneity, with a wide range of ecosystems. These include forest systems, freshwater and coastal wetlands, grasslands, mountains and dry ecosystems.

The environment of the Andean region is under pressure from numerous factors driven by the economic development and modernisation of the Andean countries. Pressures include:

- Increasing urbanisation
- Population growth
- Intensification and expansion of agricultural production
- Industrial growth
- Climate change
- Resource extraction

These pressures have resulted in the following key environmental issues impacting on the Andean region:

- Depletion and degradation of water resources
- Air pollution
- Industrial pollution
- Deforestation
- Soil erosion and desertification
- Biodiversity loss

The environmental core indicators for the SIA are natural resource stocks, environmental quality and biodiversity.

### 2.4.2 Natural Resource Stocks

The Andean region is rich in water resources, but they are under increasing pressure. Urban expansion, population growth and rising agricultural and industrial demand have increased water resource depletion. Deforestation and urban expansion influence the water cycle, decreasing the permeability of receiving zones, preventing rainwater from seeping into aquifers, and accelerating run-off in periods of high precipitation.<sup>24</sup> In many coastal cities in the Andean region, local aquifers have been over-pumped, resulting in saltwater intrusion. Throughout the region, agriculture uses the majority of water resources, followed by domestic and industrial consumption.<sup>25</sup>

Average annual rainfall in the Andean countries is 1,991 mm.<sup>26</sup> While this is very high, the region exhibits marked differences in water availability throughout different geographic areas. Water extraction stress is not severe in the Andean region. It ranges from 0.4% in Bolivia and Colombia to 3.9% in Ecuador.<sup>27</sup>

Water quality reduction is a greater problem. It is caused by untreated sewage, excessive use of fertilisers and pesticides,<sup>28</sup> and industrial, mining and energy pollution.<sup>29</sup> In 2002 some 95% of Colombian municipalities did not treat raw sewage, instead depositing it into river systems.<sup>30</sup> Access to sewerage systems in the Andean states has improved<sup>31</sup> over the last 15 years,<sup>32</sup> although urban areas are still much more comprehensively serviced than rural areas.<sup>33</sup> However, much of this sewage is not treated, and the pollution problems are merely transferred to other geographic areas.

Access to clean piped water is not universal in the Andean region. For example, a 1995 study of Ecuador's largest city, Guayaquil, showed that 35% of the 1.6 million population did not have access to adequate piped water supplies,<sup>34</sup> instead relying on water merchants who charged hugely inflated prices. However, access to 'improved'<sup>35</sup> water sources increased markedly in the period

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<sup>24</sup> UNEP GEO-LAC (2003)

<sup>25</sup> Table 2 (UNEP data)

<sup>26</sup> UNEP GEO-LAC (2003)

<sup>27</sup> UNEP GEO-LAC (2003)

<sup>28</sup> Drug production (especially in Colombia) and the associated cultivation of opium poppy has also resulted in the spread of chemical herbicides through river systems.

<sup>29</sup> UNEP GEO-LAC (2003)

<sup>30</sup> *Interim Environmental Review US-Andean Free Trade Agreement* (2005)

<sup>31</sup> With the exception of the Bolivian rural population

<sup>32</sup> Table 3 (WHO/UNICEF data)

<sup>33</sup> Ibid

<sup>34</sup> Swyngedouw, E. (1995)

<sup>35</sup> 'Improved water sources include household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collections. Unimproved water sources are unprotected wells, unprotected springs, vendor-provided water, bottled

1970-2004,<sup>36</sup> although supply is still less widespread in rural than urban areas.<sup>37</sup>

### 2.4.3 Environmental Quality

#### Air

Air pollution from rapid and often unregulated urbanisation and industrialisation has caused a deterioration of air quality in the Andean region. Urbanisation has resulted in a high number of vehicles (typically with poor emissions controls), traffic congestion and increased industrial output. A lack of regulation concerning the placement of pollutant-emitting factories means that they are often situated near or within large cities, resulting in high levels of localised air pollution.

Households burning solid fuels also contribute to reduced air quality.<sup>38</sup> This is much more prevalent in rural than urban areas in the Andean region.<sup>39</sup> Therefore while external air pollution is worse in urban areas, indoor air quality is often worse in rural areas.

Air pollution differs city to city. The impact of air pollution is dependent on city site (surrounding topography) and weather conditions. For example, in Medellin and Cali (two of Colombia's largest cities) limited air circulation exacerbates the impact of air pollution.<sup>40</sup> Air pollution also varies within cities (concentrated in 'hot spots') and from season to season.

The effects of air pollution can be seen in high levels of chronic breathing problems amongst children, and chronic bronchitis amongst adults.<sup>41</sup> Three of the most relevant aerial pollutants are particulate matter, nitrogen oxide and sulphur dioxide.

Particulate matter is emitted as part of the hydrocarbon combustion process, particularly by diesel and two-stroke engines. Particles less than 3 microns in diameter cause breathing problems and irritation of the lung capillaries. This causes respiratory morbidity, deficiencies in pulmonary functions and lung cancer. Chronically reduced lung capacity (emphysema) among the urban population is a major risk.<sup>42</sup>

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water (unless water for other uses is available from an improved source) and tanker truck-provided water'

<http://www.worldwater.org/data.html>.

<sup>36</sup> Table 2 (<http://www.worldwater.org/data.html> data)

<sup>37</sup> Table 2 (UNEP data)

<sup>38</sup> WHO – 'The use of solid fuels in households is associated with increased mortality from pneumonia and other acute lower respiratory diseases among children as well as increased mortality from chronic obstructive pulmonary disease and lung cancer (where coal is used) among adults. It is also a Millennium Development Goal indicator.'

<sup>39</sup> Table 4 (WHO Data)

<sup>40</sup> Hardoy & Satterthwaite (2007)

<sup>41</sup> UNEP GEO-LAC 2003

<sup>42</sup> <http://www.unep.org/tnt-unep/toolkit/pollutants/facts.html>

Nitrogen oxides are released by motor traffic, power production, and the burning of wood and refuse. They result in respiratory irritation, headaches, pulmonary emphysema and oedema of the lungs. Nitrogen oxides also contribute to the formation of acid rain, which can cause extensive damage to vegetation, and terrestrial and aquatic ecosystems.<sup>43</sup>

Sulphur dioxide is produced by the combustion of fossil fuels that contain sulphur, including coal, oil and diesel. Health effects include the aggravation of asthma and chronic bronchitis. Sulphur dioxide also contributes to acid rain.<sup>44</sup> A 1999 study found that emissions from copper foundries in the Peruvian city of Ilo resulted in sulphur dioxide levels recorded at up to 30 times WHO guidelines.<sup>45</sup>

### **Urban environment and waste management**

While population growth in the Andean region has slowed<sup>46</sup> since 1990, urbanisation has increased.<sup>47</sup> Urbanisation has exerted pressure on the environment of the Andean region, and resulted in concentrations of people in 'megacities' such as Lima and Bogota.<sup>48</sup> Around a third of the Andean population live in cities of 750,000 people or more.<sup>49</sup> Unplanned urban growth in the Andean countries has occurred without the necessary expansion of infrastructure and services, and generally outside of a planning and regulatory context which would limit environmental costs and protect natural resources. Environmental protection and sanitation services have failed to keep up with the pace of urbanisation in the Andean region. Much land is occupied illegally - either squatted, or lived on without planning permission - meaning that facilities for piped water and waste collection are typically lacking.

Solid waste production has increased beyond collection capacity in many cities. In the Lima metropolitan area just 60% of solid waste was collected in 2003, and in Quito 85% was collected, compared to an average of 90% in the South America / Caribbean region.<sup>50</sup> In Bogota, however, 99% of solid waste was collected. Lack of collection often results in waste being deposited in the nearest open area, causing increased disease vectors and pests (rats etc). Uncollected waste often blocks drainage channels, with an ensuing impact on water facilities.

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<sup>43</sup> <http://www.unep.org/tnt-unep/toolkit/pollutants/Nitrogen.html>

<sup>44</sup> <http://www.unep.org/tnt-unep/toolkit/pollutants/Sulphurdioxide.html>

<sup>45</sup> Follegatti (1999)

<sup>46</sup> Table 5 (WHO data)

<sup>47</sup> Table 5 (WHO data)

<sup>48</sup> UNEP GEO-LAC (2003)

<sup>49</sup> Table 5 (UNEP data)

<sup>50</sup> UNEP GEO-LAC (2003)

Urban development does not just alter the area which is being urbanised – the impacts of productive activities responding to urban demands have a much greater reach, and pollution produced by urban areas spreads far beyond urban boundaries.

#### **2.4.4 Biodiversity**

The Andean region is considered one of the most ecologically diverse areas in the world. The specific location, elevation and geological youth of the Andes results in unique conditions of biodiversity.<sup>51</sup> The tropical Andes are one of 25 worldwide ‘endemism hot spots’, containing 20,000 endemic plants, 6.7% of the world’s total<sup>52</sup>. The area also contains the largest variety of amphibians in the world, with 664 distinct species, 450 of which are listed as threatened on the 2004 IUCN Red List.<sup>53</sup>

Colombia is one of the most biologically rich areas in the world, with 21 distinct bio-vegetational zones.<sup>54</sup> Some 46% of the country is covered in forest. Ecuador is considered the world’s most biodiverse country for its area<sup>55</sup> and Peru, along with Colombia, has been declared by Conservation International as one of 17 countries worldwide with ‘megadiversity’.<sup>56</sup>

A number of key ecosystems in the Andean region can be identified. The forest systems include the Amazon forests, the montane forests of the Andes, and the Chocó forest which stretches along the Pacific coasts of Colombia, Ecuador and north-west Peru. They can be considered some of the most important environmental areas in the Andean region, due to their valuable role as a carbon sink.

These areas are under threat from deforestation to clear land for agricultural use and livestock grazing, reflecting national and international market demands. This causes a marked reduction in the productive capacity of cleared land, due to processes such as erosion and acidification, the loss of organic material, soil compacting, the loss of nutritive elements, chemical pollution and salinisation. Deforestation causes sedimentation of water courses and deterioration of water resources. The change in land use also typically increases emissions of carbon dioxide (due to deforestation), methane (from increased livestock numbers) and nitrogen oxides (from fertilisers),<sup>57</sup> with a resulting impact on climate change. Peru had lost about 9.5 million hectares of its native forests by 2000, and it is estimated that about a third of Colombia’s vegetative cover has been lost in the 30 or 40 years

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<sup>51</sup> *Regional Biodiversity Strategy for the Tropical Andean Countries* (2005)

<sup>52</sup> UNEP GEO-LAC 2003 p.64

<sup>53</sup> [www.biodiversityhotspots.org](http://www.biodiversityhotspots.org)

<sup>54</sup> *Interim Environmental Review US-Andean Free Trade Agreement* Feb 2005

<sup>55</sup> *Interim Environmental Review US-Andean Free Trade Agreement* Feb 2005

<sup>56</sup> <http://www.conservation.org/documentaries/Pages/megadiversity.aspx>

<sup>57</sup> UNEP GEO-LAC (2003)



before 2000.<sup>58</sup>

Deforestation in the Andean region is also caused by urbanisation, road building, infrastructure assembly (electricity networks, dams etc), and resource extraction. Illegal logging is a well documented problem throughout the area. For example, it is thought that about 70% of the timber sold in Ecuador has been harvested illegally, and Ecuador's deforestation rate is higher than anywhere else in South America.<sup>59</sup> Increasing oil exploration and development has occurred on the eastern slopes of the Andes and the Amazonian lowlands of the Andean countries. Resource extraction is economically important (for example, half of the Ecuadorian economy is based on the extraction of oil and gas<sup>60</sup>), but exerts a strong environmental pressure.

The Andean region also has freshwater and coastal wetlands which are threatened by pollution, and the growing exploitation of water resources for human use.<sup>61</sup> The mangroves of Colombia and Ecuador, which play an important role in coast stabilisation, are threatened by felling and the development of aquaculture.<sup>62</sup> Between Colombia, Peru and Bolivia, there are grassland ecosystems which are used for cattle farming. These areas play a valuable role in the regulation of water resources, but are under threat from overgrazing. The Andean region also contains dry ecosystems, with desert extending from the south of Ecuador, and along the Peruvian coast. There are also dry areas in the inter-Andean valleys, and the Caribbean coast of Venezuela. These areas are all at risk from increasing desertification.

#### 2.4.5 Climate Change

In the Andean region, climate change is likely to have the most pronounced impact on coral systems, sea level rises, and glacier dynamics in mountainous areas.<sup>63</sup>

The coral reefs of the Colombian Caribbean were affected by the El Niño events of 1982/3 and 1997/8, resulting in widespread reef damage.<sup>64</sup> Coral bleaching is also a problem as sea temperatures increase. Sea level rises would impact low lying coastal areas of the Andean region. The Ecuadorian coast is thought to be particularly vulnerable, and the concentration of the Andean population in the coastal zones is a potential cause for concern.<sup>65</sup>

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<sup>58</sup> *Interim Environmental Review US-Andean Free Trade Agreement* Feb 2005

<sup>59</sup> *Interim Environmental Review US-Andean Free Trade Agreement* Feb 2005

<sup>60</sup> *Interim Environmental Review US-Andean Free Trade Agreement* Feb 2005

<sup>61</sup> *Regional Biodiversity Strategy for the Tropical Andean Countries* (2005)

<sup>62</sup> *Regional Biodiversity Strategy for the Tropical Andean Countries*(2005)

<sup>63</sup> Vergara (2007)

<sup>64</sup> *Regional Biodiversity Strategy for the Tropical Andean Countries*

<sup>65</sup> Vergara (2007)

Global circulation models project a disproportionately large temperature increase in the Andes compared to surrounding lowlands,<sup>66</sup> resulting in widespread glacier retreats. It is thought that many lower-altitude Andean glaciers could disappear within the next 10 to 20 years.<sup>67</sup> Tropical glaciers between Bolivia and Venezuela have retreated from over 2,940km<sup>2</sup> in 1970 to 2,490km<sup>2</sup> in 2002.<sup>68</sup> An IPCC report claims that 'Glaciers in the tropical Andes of Bolivia, Peru, Ecuador and Colombia have decreased in area by amounts similar to global changes since the end of the Little Ice Age.'<sup>69</sup> As glaciers retreat, their regulatory ability to contribute to runoffs during dry warm periods and store water during wet cold periods is reduced.<sup>70</sup> This has the potential to cause considerable impacts on the hydroelectric power sector, water supply for urban and agricultural areas, and ecosystem integrity. The Andean states are heavily dependent on hydroelectric power for electricity provision,<sup>71</sup> which ranges from contributing 42% of Bolivian electricity consumption to 74% of Peruvian electricity consumption.<sup>72</sup> Large-scale rainfall fluctuations due to El Niño and La Niña also have a large impact on the viability of hydroelectric power generation.<sup>73</sup>

High mountain wetland ecosystems are extremely sensitive to climate change. The páramos (Northern Andean wetlands) are thought to have already had their water vapour circulation patterns influenced.<sup>74</sup> Numerous large population areas, such as Bogotá and Quito depend on these ecosystems for their water supply.<sup>75</sup>

There is a risk that the function of the Amazon basin as an ecosystem could be seriously impacted by the effect of climate change on temperatures and precipitation cycles<sup>76</sup>. This could reduce the Amazon basin's capacity to store carbon, and result in a process of 'savannization' or desertification.<sup>77</sup> The Amazon basin plays an important role in the water cycle and water balance of the whole continent, so changes to its function would have far-reaching consequences.<sup>78</sup>

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<sup>66</sup> Ibid

<sup>67</sup> Bradley *et al* (2006)

<sup>68</sup> Vergara (2007)

<sup>69</sup> IPCC Technical Paper VI *Climate Change and Water* 2008 p.96

<sup>70</sup> Vergara (2007)

<sup>71</sup> Table 1 (EIA and CIA data)

<sup>72</sup> Table 1

<sup>73</sup> IPCC Technical Paper VI *Climate Change and Water* 2008

<sup>74</sup> Ruiz *et al* (2007)

<sup>75</sup> Vergara (2007)

<sup>76</sup> IPCC Special Report (1997)

<sup>77</sup> Vergara (2007)

<sup>78</sup> IPCC Technical Paper V *Climate Change and Biodiversity*

Precipitation increases have recently been observed in Bolivia, north-west Peru and Ecuador, and more frequent floods have occurred in the Mamore Basin of the Bolivian Amazon.<sup>79</sup> There was an increase of 2.4 times in the occurrence of climate-related disasters in South America between 1970-1999 and 2000-2005.<sup>80</sup> This clearly demonstrates the vulnerability of the Andean region to climate change.

## **2.5 Baseline Regulation Characteristics**

### **2.5.1 Introduction**

The magnitude and significance of the direct and indirect sustainability impacts that result from trade liberalisation will be affected by the status of the regulatory system and broader institutional governance structures through which these sustainability pressures are managed. This section of the baseline study therefore the regulatory policy and institutional framework in the Andean countries. It also provides an evaluation of the effectiveness and quality of the regulatory framework in each of the four countries.

The baseline regulatory conditions will provide part of the evidence base for later stages of the SIA analysis. First, the assessment of impacts will be informed by what is known about the effectiveness of the regulatory regime to prevent or mitigate potential negative (and enhance any positive effects) of market opening and trade rules changes. Second, evidence of the strengths and weaknesses of the regulatory framework will inform the recommendations for flanking measures, particularly in the area of institutional strengthening and capacity building.

### **2.5.2 Environmental Regulation**

#### **Andean countries**

The Andean countries have taken an active part in defining and developing legal, policy and institutional measures for environmental policy. New environmental regulations have been introduced and high level government bodies have been established to coordinate environmental policies at the international, regional and national levels.

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<sup>79</sup> IPCC Technical Paper VI *Climate Change and Water* 2008

<sup>80</sup> IPCC Technical Paper VI *Climate Change and Water* 2008

In the Andean sub-region, the Andean Community of Nations and its Andean Committee of Environmental Authorities have attempted to promote consensus and collaboration mechanisms in sustainable development areas. Recent achievements include the Carabobo Accord (June 2001) and the Guidelines for Environmental Management and Sustainable Development in the Andean countries. The guidelines analyse priority themes and commitments assumed by member countries in international fora.<sup>81</sup>

The first meeting of the Andean Community Council of Ministers of the Environment and Sustainable Development, in Paracas, Peru, in 2005 mandated the Andean Committee of Environmental Authorities (CAAM) with updating the Andean Environmental Agenda and reinforcing institutional capacities so that the targets established in the Andean Environmental Agenda could be met.

The Andean Environmental Agenda 2006- 2010 is a guiding document framed in a long term vision which proposes short and medium-term actions. Sub-regional actions are established in order to add value to national efforts and build capacity of the member countries on environmental and sustainable development matters.<sup>82</sup> The Andean Environmental Agenda has two sections. The first contains three Thematic Issues (biodiversity, climate change and water resources), and three Crosscutting Issues (capacity building for trade, environment and sustainable development; environmental education; and sustainable production and consumption). The second section contains issues proposed by one or more countries that will be the subject of analysis and debate before becoming part of the operating agenda.

### **Bolivia**

Economic growth and income earning opportunities for the majority of the population is strongly dependant on natural resources. This is why the Morales government assigned the sustainable exploitation of natural resources a central place in the new Constitution (approved in January 2009), reinforcing the role of state intervention in the sector.

The new constitution (CPE) is a very ambitious, complex and at times vague document that includes the recognition of 36 indigenous “nations”, a wide range of social, economic and political rights, state interventions in the economy (including the control over natural resources), and a reform of the judiciary (with direct election of Supreme Court judges and a parallel system for indigenous peoples). Particularly contentious is the creation of four levels of autonomy without a clear definition of the distribution of competences and resources. The most important and controversial aspects of the constitution (autonomies, decentralization, electoral system, judicial reform) have yet to be clarified and implemented through secondary legislation.

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<sup>81</sup> UNEP, 2007

<sup>82</sup> Comunidad Andina (2007)

The sound management of the revenues from finite natural resources is a key challenge for sustainability and good governance. The land reform process stands out as crucial for reduced inequality and poverty reduction, but involves a risk for accelerating the already high rate of deforestation. There is a strong need to strengthen the capacity of public institutions, including the land reform authorities, to integrate environmental considerations as a cross cutting issue as stipulated in the CPE.

The National Development Plan (NDP) outlines an ambitious plan for public investments, including support to micro- and small enterprises as well as large scale industrial projects with significant potential environmental effects involved. In this context it is of concern that Bolivia does not have a well working system for environmental assessments. It took the government more than a year to decide which ministry should be assigned the role of being the Competent Environmental Authority with the responsibility for environmental assessments. The central role assigned to the state in the management of natural resources is one of the most important features of the CPE and the NDP. However, the capacity of the public administration to play this central role has been weakened by the large replacement of experienced staff from earlier administrations as well as by the reduction in public sector salaries.

This weakening of public administrative capacity continues to be an obstacle to effective environmental management. A clear division of responsibilities between different government entities is crucial, not least due to the increasing involvement of the state in industries with vast environmental impacts. A key explanation behind the lack of progress in implementing laws and reforms for sustainable and equitable natural resources management is the conflicting interests around these issues in Bolivian society. Social and political conflicts related to access and control of key resources such as land, forests, water and gas are likely to continue as government reforms faces fierce opposition by powerful groups. Reforms aiming at strengthening the legal system, dispute settling mechanisms and democracy at large are thus important for addressing the pressing environmental problems facing Bolivia.

### **Ecuador**

Environmental protection is embodied in Ecuador's 2008 Constitution, which even states rights for nature (chapter seven). Although the Constitution guarantees environmental protection, Ecuador's environmental laws are recent – many dating only from 2000 or later – that implementation of a legal regime has been uneven.

Examples include the Environmental Management Law and Environmental Secondary Laws, which were designed, in part, to ensure coordination within a National Decentralized System of Environmental Management. The Environment Ministry has the lead role in coordinating all agency efforts. However, the number of agencies involved in environmental management, combined with

overlapping responsibilities, has produced inefficiency and conflict. Ecuador also has a series of national laws aimed at prevention and control of pollution, protection of forests, protecting and providing for clean water, controlling air emissions from fixed sources and other laws aimed specifically at protecting public health. A special law exists for the conservation and sustainable development of the ecologically sensitive Galapagos Islands.

All environmental laws in Ecuador are legally enforceable through administrative, civil and criminal procedures, and Ecuador's Environment Ministry has the ability to refer cases to the Ecuadorian Attorney General for criminal prosecution. However, enforcement in most areas of environmental law has been weak, and fines and penalties are rarely imposed. Controls on the environmental impacts of some key industries, most notably oil exploration and extraction, are weak, ineffective or absent. Regulatory issues affecting the oil industry are handled by the Ministry of Mines, not the Ministry of Environment. In addition, PetroEcuador, the state oil company, has a special legal status that has been used to avoid certain environmental responsibilities.

### **Colombia**

Colombia has some of the most comprehensive and up-to-date environmental regulations in Latin America, and its environmental laws have been used as a model by a number of developing countries. Nevertheless, civil war, inadequate budgets, recession and a weak tax base have slowed advances in implementing and enforcing environmental regulations. Additionally, because of distance and weak government political presence, environmental enforcement in rural and frontier zones has been weak. The enforcement situation is better in major urban areas, where the state is able to exercise more authority.

Colombia has had environmental programs and regulations in place for several decades. Between 1968 and 1993, the federal government's environmental responsibilities were carried out by the National Institute of Renewable Natural Resources (INDERENA). During this period Colombia also set up a regional governing network, the *Corporaciones Autonomas Regionales* (Regional Autonomous Corporation--CAR), whose responsibility included, but was not limited to, environmental matters. In 1974, Colombia implemented a National Renewable Resources and Environmental Protection Code, which was one of the world's first comprehensive environmental protection acts. Under that act, INDERENA shared environmental responsibilities with the ministries of Health, Public Works, Defence, Energy, the National Planning Department, government departments and municipal authorities. In 1993, Colombia passed a law that established the Ministry of Environment, and created 15 new *corporaciones autonomas regionales* that were dedicated solely to environmental matters.

The 1993 law also established a National Environmental Council to coordinate environmental programs among the various ministries that form the government. The Colombian Constitution was

approved in 1991 and contains 23 articles related to environmental protection. The Constitution also sets up a structure for regional and local participation in environmental management. Despite these advances in environmental legislation and administration, concerns have been raised that restructuring and changing priorities may weaken Colombia's environmental legal regime.

### **Peru**

The concept of environmental protection is embodied in Title III, Chapter II, ("Environment and Natural Resources") of Peru's 1993 Constitution. Article 200 outlines various government obligations to provide citizens with legal tools they can use to pursue legal remedies for environmental wrongs. Additionally, Chapter II of the Constitution reserves the right to develop all of Peru's natural resources to the national government, promotes the use of natural resources, obligates the government to promote conservation of biological diversity and protected natural areas and obligates the government to promote sustainable development of the Amazon Region through appropriate legislation. The Constitution is more recent than the 1990 Peruvian Environment and Natural Resources Code, which set responsibility for administration of environmental policies across several ministries. As a result, a Peruvian Congressional Commission is in the process of preparing a comprehensive update of Peru's Environment and Natural Resources Code in order to establish a new environmental framework law for the country.

Peru has recently created an environmental ministry (Ministerio del Ambiente)<sup>83</sup> which integrates all environmental programs dispersed before across several ministries and special cross-sectoral programs, and is called to coordinate with other ministries and regional and local governments on environmental matters. The Ministerio del Ambiente took over the National Council of the Environment (CONAM) which was the coordinating body between the government, the private sector and civil society. Due to its recent creation this ministry is still in process of administrative implementation and is carrying out a consultation process to define an environmental national policy.<sup>84</sup>

Throughout the 1990s, Peru took several legislative steps that were designed to broaden the scope of natural resource and environmental protection. The law creating the CONAM was implemented in 1994, about the same time that Peru implemented a framework law on private investment that contained some environmental components. A 1990 law established a System of Natural Areas Protected by the State. In the period 1997-2001, laws were passed to address the sustainable development of natural resources and biological diversity, protection of natural areas and water resources, solid waste disposal and national environmental impact assessment. The nation's Supreme Court also has issued decrees establishing strategic regulations on biodiversity and

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<sup>83</sup> Created by Legislative Decree No. 1013 on May 14<sup>th</sup> 2008.

<sup>84</sup> A document outlining the environmental policy for 2009-2021 was made available for discussion on March 2009. It can be found at [http://www.minam.gob.pe/index.php?option=com\\_content&view=article&id=123&Itemid=65](http://www.minam.gob.pe/index.php?option=com_content&view=article&id=123&Itemid=65).

regulations to implement the 1997 law establishing protected natural areas.

Peru has a highly decentralised form of environmental enforcement based on regulations that are specific to industries or industry or sectors of the economy. Several sectoral offices have their own individual sets of administrative sanctions. These include authorities for forestry, mining, hydrocarbons, electricity and manufacturing. With enforcement occurring over such a wide variety of government agencies, it has been difficult for the Peruvian government to coordinate institutions responsible for law enforcement, judicial and environmental program management. The national government is taking steps to improve coordination among these various institutions. Peru's 1990 Environment and Natural Resources Code gave Peruvian citizens some access to civil courts to address environmental issues. The 1990 Code gave citizens the right to file injunctions (*amparos*) in civil court that can result in legal actions to stop environmental law violations. However, the *amparos* do not address issues of compensation for damages or issues of environmental remediation. The 1990 Code also established discovery processes (*procesos de conocimiento*) that are somewhat similar to filing civil lawsuits addressing environmental concerns.

Article 200 of the new Peruvian Constitution gave citizens four new legal tools that include: a governmental obligation to provide legal remedies for infractions of environmental law; a similar governmental obligation to force government authorities to comply with relevant environmental laws; a governmental obligation to provide "popular action" to more generally correct violations of environmental law; and a guarantee that violations of the environmental provisions of the Constitution will be considered by Peru's Constitutional Court. In circumstances where there is no governing sectoral agency, the environment ministry can apply administrative sanctions. Ministry and other government officials with environmental powers can impose administrative fines, but the fines are generally very modest and do not act as a deterrent. Additionally, administrative judicial proceedings allow environmental offenders a large number of appeals.

### **2.5.3 The Effectiveness of Environmental Regulation and Policy**

Previously, it was widely believed that environmental quality would inevitably decline with economic growth in lower income economies as poorer countries lacked the institutional capacity and political commitment to implement effective environmental regulation. However, this conventional view – known as the Kuznets curve hypothesis – has been challenged by new evidence that suggests that environmental performance is positively related to the quality of environmental governance.<sup>85</sup>

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<sup>85</sup> The Kuznets curve disappears after controlling for the quality of environmental institutions and geographical vulnerability (climate and terrain factors). See, for example, Dasgupta et al 2006



The Environmental Performance Index (EPI) is a measure of performance in six policy areas: environmental health, air pollution, water resources, biodiversity and habitat, productive natural resources and climate change.<sup>86</sup> The EPI is specifically designed to assist policymakers assess the effectiveness of environmental policies against relevant performance goals and provides a baseline for cross country comparisons within relevant peer groups.

Table 19 shows the overall EPI results for each of the Andean countries. For comparison purposes, the table also provides the average score for the Latin American and Caribbean countries and for countries with similar level of per capita income.

	<b>EPI Score</b>	<b>Regional Group Average</b>	<b>Income Group Ave</b>
<b>Bolivia</b>	64.7	78.4	66.8
<b>Colombia</b>	88.3	78.4	75.9
<b>Ecuador</b>	84.4	78.4	75.8
<b>Peru</b>	78.1	78.4	75.9

The EPI scores indicate above average performance in Colombia, Ecuador and Peru, whereas in Bolivia environmental policy outcomes fall below the peer-group averages.

More detailed understanding on the current status of environmental policy in the Andean countries can be derived from careful analysis of the individual policy categories. Table 20 shows the scores for each of the six major sub-components of the EPI. The relative rankings of the four Andean countries are shown in brackets.

<sup>86</sup> The EPI score is calculated from 25 core indicators relating to the six policy areas. The results for the core indicators are used to calculate average scores for each of the six policy areas. The six scores are then combined to give an overall EPI score. All scores are scaled from 100 to 0. See Yale Center for Environmental Law and Policy, 2008

**Table 20: EPI Sub Component Scores, 2008**

	<b>Environmental Health</b>	<b>Air Pollution</b>	<b>Water Resources</b>	<b>Biodiversity</b>	<b>Productive Natural Resources</b>	<b>Climate Change</b>	<b>Overall Average Rank</b>
<b>Bolivia</b>	61.2 (1)	49.4 (1)	70.7 (1)	78.4 (3)	84.5 (3)	61.3 (1)	(1.6)
<b>Colombia</b>	91.4 (3)	98.3 (3)	98.3 (3)	75.0 (2)	94.8 (4)	87.1 (3)	(3)
<b>Ecuador</b>	91.7 (4)	98.9 (4)	98.9 (4)	79.6 (4)	61.8 (1)	80.1 (2)	(3.2)
<b>Peru</b>	78.3 (2)	96.9 (2)	96.9 (2)	58.1 (1)	80.6 (2)	87.1 (3)	(2)

The rankings shown in table 20 show variation in performance in different areas of environmental policy. In Ecuador, for example, performance in the management of productive natural resources is ranked below the other three countries, whereas its performance in the other five areas is superior to that of the other Andean countries. The average of the ranks across the six areas confirms that environmental policy is less effective in Bolivia than in the other three economies.

#### **2.5.4 Labour Regulation**

The four Andean countries have individually signed most of international agreements on labour standards referred to protection against child labour, forced labour and labour discrimination, and to protect free affiliation to unions, collective negotiation, labour inspection in many sectors and the rights of indigenous people. Additionally, in 2004, at the Andean Community level, the countries approved a legal system (the Andean Social Security Instrument) to adapt the Common Market objectives to the current structure of the social security systems of the countries<sup>87</sup>. They also approved Decision 584 "Andean Work Safety and Health Instrument" to promote and regulate the activities to be developed at work centres in Member Countries, to reduce or eliminate any and all damages to workers' health through the implementation of control measures and the development of activities required to prevent work related risks. Both decisions are now fully regulated.<sup>88</sup>

Notwithstanding the progress made in regulation, concerns have been raised about the weak mechanisms to ensuring compliance with the basic decent work standards in all the four countries.

A number of adult labour rights issues affect individual countries. To this end, Ecuador's poor track record of supporting worker's rights and preventing child labour was considered sufficiently

<sup>87</sup> Decision 583 adopted on May 2004.

<sup>88</sup> Details available at: <http://www.comunidadandina.org/normativa/res/R957sg.htm>

problematic and in 2005 US trade negotiators stated this as a reason for not concluding a trade agreement.<sup>89</sup> While workers do have the right of assembly, complex rules govern assembly and protest rights, making doing so difficult without breaking the law. These rules for example include a minimum size of 30 workers required for forming a union, a policy criticised by the ILO. Additionally, forming unions across companies even within the same occupation is not permitted.

In Bolivia meanwhile, freedom of association in the workplace is generally respected. The requirement to have at least 20 employees to form a union excludes approximately 70% of the country's workforce from union activities. However the new Constitution significantly extends labour rights.

Colombia has a poor history with the right to assembly, which unfortunately has persisted throughout its economic growth this decade. In the first 5 months of 2008, 26 trade union officials were killed, a 70% rise over the same period in 2007. Of a labour force of 20 million, only 1%, or 200,000 people, can exercise their legal right to strike, a result of tangible threats of violence.<sup>90</sup> The government has made labour rights an increasing priority, with funds to protect trade union officials growing from US\$ 1.7 million to US\$ 34 million in 2007.

Forced labour is also a persistent concern. In Bolivia, up to 7,000 indigenous Guaranis work as indentured servants in remote areas of Chuquisaca, and up to 30,000 indigenous people are in forced work on agricultural operations in the Beni and Santa Cruz Departments of the country.<sup>91</sup> Such patterns arise despite that the country's national minimum wage of 436 Bolivianos per month (2007) and maximum hours per week of 48, which are not effectively enforced.

Further, and driven largely by the endemic poverty levels, a large number of informal workers earn wages below minimum levels, in turn undermining efforts to protect legal workers' rights. In Bolivia's mining sector for example, workers earn an average of 21 Bolivianos per 12 hour days, with work safety conditions having improved little in the last decade.<sup>92</sup> In any case, in both Ecuador and Colombia, typical wages amount roughly to merely half the necessary amount for daily living expenses, capturing workers in a cycle of debt. Meanwhile, in agricultural areas injudicious pesticide use contributes to high levels of premature births, congenital malformations and miscarriages.<sup>93</sup> In

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<sup>89</sup> U.S.: Ecuador's Labor Abuses Violate Trade Act, Human Rights Watch, 19 September 2005

<sup>90</sup> Capdevila, Gustavo, COLOMBIA: ILO to Keep an Eye on Labour Rights, Inter Press Service, 13 June 2008

<sup>91</sup> Enganche y servidumbre por deuda en Bolivia, International Labor Organisation, Geneva, January 2005

<sup>92</sup> Bolivia, Country Report on Human Rights Practices, Bureau of Democracy, Human Rights, and Labor, US Dept of State, 11 March 2008

<sup>93</sup> Worker Justice and Basic Rights on Flower Plantations in Colombia and Ecuador, International Labor Rights Forum, 13 February 2007

Ecuador alone, 55% of female workers also state they have been victims of on the job sexual harassment.<sup>94</sup>

In addition, child labour is also a persistent yet not so widespread problem<sup>95</sup>. In cases where children manage to be removed from worksites, they in any case usually lack sufficient assistance to resume a normal lifestyle and end up returning to work. Among Peru's 14 child labour inspectors all lack appropriate training, logistical support and supplies, and even often lack a vehicle with which to reach inspection sites. Given that Peru is not the poorest member of the Andean countries, the situation in other member countries is not likely to be better. Child prostitution is also a problem, but specific data is difficult to obtain. The Bolivian government has a Defender of Children and Adolescents program, with a total of 260 offices in operation in 2007 to try to protect children from such circumstances.<sup>96</sup>

### 2.5.5 Regulatory Quality and Governance

It is important to distinguish between the regulatory policies that a country has and the capacity to implement these policies. A country's regulatory framework is embedded in a wider institutional and governance context and regulatory quality will include both the design and implementation of regulatory instruments, and the broader aspects of good governance. The World Bank's Governance Indicators provide country rankings in terms of government effectiveness (covering competence of the bureaucracy, quality of policymaking and quality of service delivery and rule of law (including predictability and effectiveness of judicial system, respect for law and order and enforcement of contracts)).<sup>97</sup> Tables 21 and 22 show the values for each indicator for the Andean countries, for 1998, 2003 and 2007.<sup>98</sup>

Table 21: Government Effectiveness Indicators			
	1998	2003	2007
Bolivia	-0.04	-0.36	-0.83
Colombia	-0.41	-0.20	+0.01
Ecuador	-0.49	-0.75	-1.04
Peru	+0.07	-0.44	-0.44

<sup>94</sup> Ibid

<sup>95</sup> See, for instance, IREWORC's (International Research on Working Children) reports on Andean countries ([http://www.childlabour.net/docs/Rural%20Child%20Labour%20in%20Andean%20Countries\\_summary%20bundle\\_final.pdf](http://www.childlabour.net/docs/Rural%20Child%20Labour%20in%20Andean%20Countries_summary%20bundle_final.pdf)).

<sup>96</sup> Bolivia, Country Report on Human Rights Practices, Bureau of Democracy, Human Rights, and Labor, US Dept of State, 11 March 2008

<sup>97</sup> Kaufmann et al 2008

<sup>98</sup> The scores rank from -2.5 to +2.5 with a higher score indicating a higher quality of governance.

<b>Table 22: Rule of Law Indicators</b>			
	<b>1998</b>	<b>2003</b>	<b>2007</b>
<b>Bolivia</b>	-0.30	-0.47	-0.96
<b>Colombia</b>	-0.75	-0.92	-0.57
<b>Ecuador</b>	-0.66	-0.67	-1.04
<b>Peru</b>	-0.67	-0.62	-0.71

Table 21 indicates that government effectiveness has declined over time in three of the four Andean countries. Table 22 suggests that there has been deterioration in the rule of law indicators in each of the Andean countries over the past decade.

### **2.5.6 Summary**

The review of quantitative evidence and available indicators relating to regulation baseline conditions suggests variations among the Andean countries in the effectiveness of environmental regulation and environmental policy outcomes, with some countries achieving results that exceed that of their income-group peers while others fail to keep up. Environmental outcomes are strongly correlated with the quality of overall governance, as measured in terms of government effectiveness and the rule of law. The lack of improvement in the quality of governance in the Andean countries over the past decade suggests that all countries will continue to be challenged in ensuring effective implementation and compliance with environmental regulatory measures.



## 3. SUSTAINABILITY IMPACT ASSESSMENT

### 3.1 Economic Modelling

#### 3.1.1 The CGE Model

Application of a multi-region computable general equilibrium (CGE) model<sup>99</sup> has been used to derive the core economic impacts of the proposed multi-party trade agreement. The CGE model incorporates standard Walrasian assumptions: optimising behaviour on the part of economic agents (consumers, producers and government); utility-maximising consumers acting subject to a budget constraint; producers maximising profits by minimising inputs; and primary factor costs for a set level of technology.

In general, it is further assumed that the regional economy comprises firms producing output through use of land, labour, capital and natural resources. This output, which itself may have utilised intermediate products, is purchased by consumers, government, the investment sector, as well as by other firms. Capital and labour move freely between production sectors. Land, labour and natural resources are restricted in their movement between regions.

Given their significance to trade-related studies, taxes are integrated in the model selectively and at several levels, including applied most-favoured national tariffs, antidumping duties, countervailing duties, price undertakings, export quotas and other trade restrictions. Trade barrier estimates for the services sector are slightly more complicated to arrive at owing to frictional trading costs, to account for which the model is appropriately augmented. The model provides output on the expected changes in a number of economic indicators: the percentage change in bilateral export, output, value added and employment will be estimated for example.

The study undertaken by the economic modelling team examines two potential liberalisation scenarios:

‘Modest liberalisation’ scenario: 90% reduction of tariffs, 50% liberalisation of services, 1% reduction of trade transaction costs (‘scenario 1’)

‘Ambitious liberalisation’ scenario: 97% reduction of tariffs, 75% liberalisation of services, 3% reduction of trade transaction costs (‘scenario 2’)

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<sup>99</sup> For more information on the model, please refer to the technical annex.

For each scenario, two sets of results are produced: 'short run' and 'long run'. In the 'short run' capital is fixed. In the 'long run' investment is allowed to occur resulting in a change in capital formation. In both cases, the results are projected to 2018.

In the following sections we use the following terms to describe the four sets of model results:

Scenario 1a

Short run modest liberalisation scenario

Scenario 1b

Long run modest liberalisation scenario

Scenario 2a

Short run ambitious liberalisation scenario

Scenario 2b

Long run ambitious liberalisation scenario



### 3.1.2 Macro Level Results

The model results indicate that all four Andean countries gain in terms of an increase in GDP by 2018. However, as Table 23 shows, the change expressed as a percentage of baseline GDP is small, ranging from 0.7% in Peru to 2.1% in Bolivia, under the 'ambitious' liberalisation scenario and allowing for an increase in fixed capital formation.

For the EU27 countries, there is no change in GDP resulting from the trade liberalisation scenarios.

Country	Scenario 1a	Scenario 1b	Scenario 2a	Scenario 2b
EU 27	0.0	0.0	0.0	0.0
BOLIVIA	0.5	1.0	1.1	2.1
COLOMBIA	0.2	0.6	0.5	1.3
ECUADOR	1.2	1.2	1.8	1.9
PERU	0.2	0.3	0.5	0.7

In absolute terms, the estimated real income effect is biggest for the EU, ranging from € 1000 billion in the static setting for the comprehensible trade agreement up to € 4 000 million in the dynamic setting for the very comprehensive trade agreement. Among the Andean countries, the increase in real income is expected to be biggest for Colombia, the largest economy being studied, and smallest for Bolivia. Looking at the relative changes in real income, real income effects as percent change in GDP, the effect for the EU is less than 0.1 percentage of GDP.

Country	Scenario 1a	Scenario 1b	Scenario 2a	Scenario 2b
EU 27	1043	2754	1571	4055
BOLIVIA	100	195	222	406
COLOMBIA	394	1229	1034	2761
ECUADOR	551	541	834	868
PERU	277	436	696	940

As can be seen from the table above, the relative income gain is expected to be biggest for Bolivia and Ecuador, where real income is expected to increase between 0.5 and 2 percent of GDP.

#### *Wage Effects*

Wage effects for unskilled and skilled labour are shown in Table 25 and 26. As can be seen from Table 25, there are no effects in wages for unskilled workers in the EU under all of the scenarios. For all Andean countries the effects are very small for the short term. The long term changes in unskilled wages are also very small with the effects being the highest for Bolivia with a 1.3% increase in

unskilled workers' wages under the ambitious long term trade agreement scenario.

Table 26 provides estimates of the adjustment process as the economy moves from the pre-liberalisation equilibrium to the new post-liberalisation equilibrium.

<b>Table 25: Effects on European and Andean wages, Unskilled workers, Percent change</b>				
Country	Scenario 1a	Scenario 1b	Scenario 2a	Scenario 2b
EU 27	0.0	0.0	0.0	0.0
BOLIVIA	0.2	0.6	0.5	1.3
COLOMBIA	-0.1	0.3	0.1	0.9
ECUADOR	-0.1	-0.2	0.0	0.0
PERU	0.2	0.3	0.5	0.7

Source: ICE Model Simulations.

Changes in wages for skilled workers are even smaller than changes for unskilled workers. Similarly to unskilled wages, no changes occur in the EU. Changes in wages for skilled workers in the Andean countries are all around or below 0.5%, indicating a very small change.

<b>Table 26: Effects on European and Andean wages, Skilled workers, Percent change</b>				
Country	Scenario 1a	Scenario 1b	Scenario 2a	Scenario 2b
EU 27	0.0	0.0	0.0	0.1
BOLIVIA	-0.2	0.3	-0.3	0.6
COLOMBIA	-0.5	-0.1	-0.5	0.3
ECUADOR	-0.3	-0.4	-0.5	-0.5
PERU	0.0	0.2	0.1	0.3

Source: ICE Model Simulations.

### *Employment Effects*

Table 27 provides estimates of the adjustment process as the economy moves from the pre-liberalisation equilibrium to the new post-liberalisation equilibrium. The table shows the scale of labour force shifts (in percentage terms) between sectors during the transition period.<sup>100</sup> The estimates indicate that close to 3% of the employed labour force in Bolivia and Ecuador would be involved in inter-sectoral shifts in employment, giving rise to accompanying adjustment costs.

<b>Table 27: Shifts in Total Employment (%)</b>								
Country	Scenario 1a		Scenario 1b		Scenario 2a		Scenario 2b	
	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled
<b>EU27</b>	0.03	0.01	0.03	0.01	0.04	0.02	0.04	0.02
<b>BOLIVIA</b>	1.03	1.45	0.99	1.40	2.11	3.02	2.05	2.93
<b>COLOMBIA</b>	1.3	0.9	0.9	1.3	2.0	1.8	2.0	1.8
<b>ECUADOR</b>	2.2	1.7	1.7	2.2	2.7	2.9	2.7	2.8
<b>PERU</b>	0.7	0.6	0.6	0.7	1.1	1.2	1.1	1.2

<sup>100</sup> The model assumes that the total level of employment remains unchanged.

Table 28: Effect on European and Andean Labour displacement for unskilled and skilled workers, percent								
Country	Scenario 1a		Scenario 1b		Scenario 2a		Scenario 2b	
	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled
EU27	0.03	0.01	0.03	0.01	0.04	0.02	0.04	0.02
BOLIVIA	1.03	1.45	0.99	1.40	2.11	3.02	2.05	2.93
COLOMBIA	1.3	0.9	0.9	1.3	2.0	1.8	2.0	1.8
ECUADOR	2.2	1.7	1.7	2.2	2.7	2.9	2.7	2.8
PERU	0.7	0.6	0.6	0.7	1.1	1.2	1.1	1.2

Source: ICE Model simulations

As can be seen from the above tables, there are limited changes occurring in the EU, with less than 0.5% of the labour force affected. Moreover, the changes in the Andean countries are also very small. The highest changes occur in Bolivia and are mostly for skilled workers.

#### *National Trade Effects*

Tables 29 and 30 below summarise the changes in the EU and Andean countries' global trade flows.

Table 29: Percent change in Value of National Exports				
Country	Scenario 1a	Scenario 1b	Scenario 2a	Scenario 2b
EU 27	0.0	0.1	0.1	0.1
BOLIVIA	2.7	3.5	4.9	6.5
COLOMBIA	5.8	6.2	9.0	9.9
ECUADOR	5.8	5.9	7.8	7.9
PERU	3.6	4.0	6.6	7.2

Source: ICE Model Simulations.

Table 30: Percent change in Value of National Imports				
Country	Scenario 1a	Scenario 1b	Scenario 2a	Scenario 2b
EU 27	0.0	0.1	0.1	0.1
BOLIVIA	3.5	3.7	6.4	6.8
COLOMBIA	6.0	6.3	9.5	10.2
ECUADOR	6.0	6.1	8.3	8.3
PERU	4.8	4.7	8.3	8.3

Source: ICE Model Simulations.

As can be seen from the tables, there are minimal effects on the EU's global trade flows. On the other hand, the Andean countries, being small countries, experience changes in both export and import flows. Colombia's trade is affected the most, with an approximately 6% increase in both exports and imports in the short run and around a 9-10% increase taking place in the long run. All other Andean countries experience important increases in both export and imports. Smaller changes

occurring on the short run and under the less comprehensive trade agreement scenarios. The increase in export and imports is around 7% for Bolivia in the long run, deep trade agreement scenario, and around 8% for Ecuador. For Peru under the same scenario, imports would increase by 8.3% while exports by 7.2%.

### *Global Effects*

A bilateral trade agreement between EU27 and Andean is expected to have repercussions on other economies as well, through both trade creation and trade diversion. Table 31 below contains a summary of the global effects of a potential trade agreement. This is based on the estimations of the Ambitious scenario. The effects of the other liberalisation scenarios, which are even smaller, are available in more detail in the appendix.

Region	National Income Effect (Millions of 2007 €)	Income Effect % Change in GDP	% Change in Value of Exports	National Income Effect (Millions of 2007 €)	Income Effect % Change in GDP	% Change in Value of Exports
Mercosur	-115.7	0.0	-0.1	-582.2	0.0	-0.2
USA	-269.4	0.0	-0.1	-756.3	0.0	-0.1
Other LDCs	6.4	0.0	0.0	55.0	0.0	0.0
Rest of the World	-449.5	0.0	0.0	-1972.3	0.0	0.0

Source: ICE Model Simulations. Note: All results are reported for a baseline including expected effects of a successful completion of the Doha-round, and a projection of baseline to 2018.

As can be seen from the table, the global effects of even the most ambitious scenario are very small. The national income effects for Mercosur, USA and the rest of the world are negative, positive for the LDCs, nevertheless these effects are small for both short and long run. This is also reflected in the second and fifth column of table 34, showing the percentage change in GDP for the short and the long run. None of these regions experience a change in their GDP after the implementation of the trade agreement. There are some very small changes occurring in both exports and imports of the two regions which are more economically linked to the Andean countries, with a minor drop in exports occurring under both the short and the long run. These changes are nevertheless close to zero.

### 3.1.3 Economic Modelling and Sustainability Assessment

Results from the quantitative equilibrium modelling identify the expected magnitude of the increase or decrease in production in each economic sector. In turn, this forms the starting point for the economic, environmental and social assessment of EU-Andean trade liberalisation.

In this Draft Interim Technical Report, the sustainability assessment is undertaken at the sectoral level and covers agricultural and processed agricultural goods, industrial products, services and other trade issues (investment, public procurement and trade facilitation).

Following the stakeholder consultations and the further work of the local teams, detailed economic, social and environmental assessment will be carried out at the subsector level for the sectors selected for deeper analysis.

**For ease of presentation, the long-run ambitious scenario (2b) has been selected for inclusion in the sectoral economic modelling data tables. A full dataset covering all scenarios is contained in the technical annex to this report. An ambitious liberalisation scenario is also assumed in the social and environmental assessment. However, where appropriate, a distinction is made between short term adjustment effects and long term equilibrium outcomes.**

## 3.2 Agricultural and Processed Agricultural Goods

### 3.2.1 Economic Impacts

#### *Real output*

Table 32(a) shows the estimated changes in output for grains, vegetables, fruit and nuts, other primary foods and other agriculture, for scenario 2b, (which assumes 97% reduction of tariffs in all sectors, including sensitive sectors such as bananas and sugar).<sup>101</sup>

<b>Table 32 (a) : Agriculture goods: Sectoral Changes (%)</b> (share in total value added brackets)					
	<b>EU27</b>	<b>Bolivia</b>	<b>Colombia</b>	<b>Ecuador</b>	<b>Peru</b>
<b>Grains</b>	0.198 (0.2)	1.244 (2.7)	-4.449 (0.8)	-2.581 (1.4)	0.181 (1.8)
<b>Vegetables, fruit and nuts</b>	-1.481 (0.5)	0.756 (5.4)	11.245 (2.9)	8.722 (6.7)	0.662 (2.1)
<b>Other primary foods</b>	0.104 (0.9)	0.491 (8.5)	-1.467 (3.9)	-1.899 (2.8)	0.486 (2.8)
<b>Other agriculture</b>	0.236 (0.6)	-0.498 (1.2)	-5.086 (1.8)	-9.764 (2.5)	0.257 (3.0)
<b>Totals</b>	-1.178 (2.2)	1.993 (17.8)	0.243 (9.4)	-5.522 (13.4)	1.586 (9.7)

<b>Table 32(b) : Primary products and processed agricultural goods: Sectoral Changes (%)</b> (share in total value added in brackets)					
	<b>EU 27</b>	<b>Bolivia</b>	<b>Colombia</b>	<b>Ecuador</b>	<b>Peru</b>
<b>Forestry</b>	0.012 (0.2)	0.574 (1.3)	-0.994 (0.3)	-0.619 ( 1.9)	0.019 (0.7)
<b>Primary fishing</b>	0.002 (0.2)	0.162 (0.6)	-0.045 (0.8)	-0.065 (3.4)	0.089 (2.7)
<b>Primary mining</b>	-0.022 (0.7)	0.262 (10.7)	0.419 (5.9)	0.195 (16.0)	0.452 (3.9)
<b>Processed foods, beverages and tobacco</b>	0.066 (2.9)	1.025 (2.9)	-0.836 (3.4)	-1.834 (4.2)	0.567 (7.4)
<b>Totals</b>	0.058 (4)	2.023 (15.5)	-1.456 (10.4)	-2.323 (25.5)	1.127 (14.7)

<sup>101</sup> ie long run ambitious scenario. The results for the other three scenarios give similar changes although the magnitude of the changes is smaller, reflecting the lower level of liberalisation and fixed stock of capital. For a complete list of products included in each subsector, refer to annex 2.

While there is some heterogeneity on the effects of the different scenarios on sectoral output in the Andean countries, for the EU27 the liberalisation of trade with the Andean countries has a negligible impact on primary products and processed foods sub-sectors. There are only very small changes in the agriculture and agricultural processed goods sector and a small decline in vegetables, fruit and nuts subsector, but this subsector accounts for less than half a percentage of total output in 2018. For the EU 27 countries the total decline in agricultural goods resulting from scenario 2b is 1.12%.

Andean countries experience more pronounced changes in the output of some of the sectors. Table 32(a) shows a significant decline in agriculture products in Ecuador and small increases in the other three Andean countries. The vegetables, fruit and nuts subsector is predicted to increase its output significantly in Colombia (11.2%) and Ecuador (8.7%). In both countries, this subsector accounts for a significant share of total national value added. This is almost entirely due to banana production<sup>102</sup>. At present the EU market is heavily protected with applied tariffs. Hence, the large reduction in tariffs that is assumed in the 'ambitious' scenario results in a large increase of banana exports to Europe from Colombia and Ecuador.

Both Bolivia and Peru experience small increases across all sectors, with the exception of a half percent decrease in Bolivia in output of 'other agriculture', which includes cotton and wool. Both countries have overall net increases in agriculture output, particularly Bolivia.

Table 32(b) shows the changes in primary sectors (forestry, fishing and mining) and processed foods, beverages and tobacco.<sup>103</sup> The EU 27 countries show a marginal decline in mining. The importance of the mining sector, particularly in Bolivia and Ecuador, results in a significant expansion in this sector under scenario 2b, in table 32(b). The growth in mining output is linked to the growth in capital stock through investment that is assumed to occur under scenario 2b. However, this growth assumes that the political conditions and negotiations with local population regarding mining expansion in the rural area are favourable to further large-scale mining development. The processed foods, beverages and tobacco subsectors account for between 7.2% (Colombia) and 10.2% (Peru) of total national output in the Andean countries. In two of the four countries, liberalisation scenario 2b is predicted to result in an increase in production and exports.

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<sup>103</sup> The figures are for scenario 2b and assume 97% liberalisation.

### 3.2.2 Social Impacts

#### *Poverty and Inequality*

As discussed in section 2, the baseline conditions for poverty (and inequality) in the Andean countries are below the levels prevailing in most other Latin American countries. Poverty is more pronounced in the rural sector, although there are considerable intra-rural differences in poverty levels, depending on the income-generating opportunities open to households in formal and informal employment.

Given that agriculture and extractive industries (mining and hydrocarbons) are in many cases competing activities in the rural area, the growth in output from the mining sector can be expected to have differential social impacts on different segments of the sector. In the large-scale formal mining sector, employment is expected to increase, however, the restrictions on workers' rights will restrain any significant increase in real wages or improvement in working conditions. As pointed out in the preceding discussion of baseline labour conditions, a number of adult labour rights issues affect individual countries.

Additional negative social impacts of further expansion of mining and hydrocarbons in rural territories of the four Andean countries might arise from the local and national conflicts that have emerged in the last five years. Although governments have been keen to set policies and promote institutional change aiming to attract new FDI in the extractive industries, in many cases the local population's reaction has opposed such an expansion. Factors that explain tensions and conflicts are related to competition over the resources involved (land and water), the negative effects of mineral development (enclave economies, social problems, environmental damage) and the increased awareness of desirable alternative strategies of development in rural – in particular indigenous – territories.<sup>104</sup> Given that European companies are involved in the mining and hydrocarbons sectors in Andean countries and in initiatives for promoting social corporate responsibility,<sup>105</sup> attention needs to be paid to the fragile political conditions in which a mineral-based growth strategy develops.

The expansion of output in the banana sector in Colombia and Ecuador might have a positive impact on household income through the increase in employment. However, long term growth in poor household incomes and reduction in poverty will be dependent upon significant local reinvestment on the part of the large foreign companies that dominate the agro-export industries.<sup>106</sup> In Ecuador,

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<sup>104</sup> Bebbington and others (2008).

<sup>105</sup> For example the ICMM's resource endowment initiative and DFID's transparency initiative.

<sup>106</sup> In past years, agro-export firms have benefited from pro-export subsidy policies and exchange-rate differentials without any clear impact on local economies (see the regional reports of the Red EU-CAN).



for instance, the banana sector has represented an average of 16% of agriculture GDP between 2000 and 2008, and generated approximately 383,000 jobs (in direct and indirect employment), which would have benefited nearly 12% of the country population.<sup>107</sup> However, in the last 15 years, in most of the provinces where the banana sector is concentrated (El Oro, Guayas y Los Ríos) improvements on income, poverty reduction and inequality have not happened.<sup>108</sup>

The increase in processed foods is also likely to have a positive social impact through the increased employment that it generates for previously unemployed labour from lower-income households. However, whilst the increase will benefit agriculture commodities such as Andean grains (quinoa, amaranth, bean), flowers, fruits, cacao and potentially biofuels feedstock, it may impact negatively on products such as sugar cane, potato and dairy (both milk and its derivatives).<sup>109</sup> Given that the promotion of the later products are an important component of the countries' programmes of poverty reduction,<sup>110</sup> increased competition of food imports of European origin may produce counter-productive effects.<sup>111</sup>

#### *Health and Education*

Improved economic performance, particularly in agricultural and mining exports, should in principle strengthen public finances and enable higher public expenditure on health and education. However, pro-poor fiscal policies have traditionally been given a low priority in the Andean countries and where social expenditure and social protection programmes have been adopted; implementation and targeting have been weak.<sup>112</sup> These programmes show a large impact on the poverty gap, but little impact on the poverty headcount. They also show a significant rise in school enrolments and attendance of boys and girls among beneficiary households (but impact on child labour are less clear cut), and large improvements in primary health care utilization.<sup>113</sup> For instance, in Peru a 2004 report by the *Controloria General de la Nacion* (CGN) noted that only about half of resources allocated under the *Vaso de Leche* (Glass of Milk programme) actually reached the targeted population of young children and expecting and nursing mothers.<sup>114</sup> It is not expected, therefore,

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<sup>107</sup>Servicio de información agropecuaria del Ministerio de Agricultura y Ganadería del Ecuador. Banano Informe 2. (<http://www.sica.gov.ec/cadenas/banano/docs/informe2.html>).

<sup>108</sup> See Larrea and others (2008).

<sup>109</sup> See Inurritegui and others (2008).

<sup>110</sup> Long standing work of the ministries of agriculture and the NGO sector (many with European support) in Ecuador, Peru and Bolivia has focused on technological improvement of those crops as part of a food security strategy as well as a way of improving entry opportunities for the rural into regional and national markets.

<sup>111</sup> Mendoza, 2008

(<http://www.cop-la.net/files/CIES-COPLA-ingles.pdf?q=en/system/files/var/www/copla/files/CIES-COPLA-ingles.pdf>)

<sup>112</sup> Barrientos and Hinojosa, 2009.

<sup>113</sup> Barrientos and Santibañez, forthcoming.

<sup>114</sup> IMF, 2007

that EU-Andean trade liberalisation will have a significant impact on the existing levels of health and education provision in the Andean countries.

There may be more specific health impacts associated with the expansion in agricultural and mining activities. In agricultural areas, injudicious pesticide use contributes to high levels of premature births, congenital malformations and miscarriages.<sup>115</sup> The mining sector is a key source of water pollution – acid water with high metal content -- which gives rise to health problems for local communities. In Bolivia, for example, cooperative and small scale mining, in which more than 70,000 families work, is particularly polluting.<sup>116</sup> In western Bolivia, the severe contamination of the Pilcomayo River as well as the Poopo and Uru Uru lakes are examples where mining activities have resulted in significant health problems.<sup>117</sup>

### **3.2.3 Environmental Impacts**

#### *Natural Resource Stocks and Environmental Quality*

The predicted growth in the agriculture and processed products sector is expected to place additional pressure on both land and water. Water pollution is a serious problem in each of the Andean countries. Key sources of pollution are discharges from mining activities and agricultural runoffs. One of the most obvious examples is the Pilcomayo river basin in Bolivia, where it has been estimated that the contamination of this river, mainly caused by mining, creates annual losses of millions of dollars to agriculture, cattle-breeding and fishery.<sup>118</sup> Due to uncontrolled use of pesticides agricultural run-offs often include organochlorinated compounds.

In the processed agricultural products subsector, few industries comply with industrial discharge standards. In Santa Cruz, Bolivia, for example, out of the 600 largest industries which include sugar refineries, tanneries and production of vegetable oil, only a few pre-treat their wastes.<sup>119</sup>

Deforestation is an additional potential area of environmental pressure. Increased market access for processed timber products can be expected to add to existing deforestation trends. Regulation of illegal logging is weak. In Ecuador, it is estimated that forest loss is faster than anywhere else in South America. Half the country's forests have been degraded or destroyed in the past three decades.

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<sup>115</sup> Worker Justice and Basic Rights on Flower Plantations in Colombia and Ecuador, International Labor Rights Forum, 13 February 2007

<sup>116</sup> World Bank, 2006

<sup>117</sup> World Bank, 2006

<sup>118</sup> European Commission, 2005

<sup>119</sup> Sludge and Jarden, 2007

Illegal logging is a significant contributor to this problem. Ecuador's Wood Industry Association estimates that 70 percent of all timber sold in the country is illegally harvested. Bolivia has about 10 percent of South America's tropical forests. This asset is being rapidly reduced due to widespread deforestation. Causes of the deforestation include the advance of the agriculture frontier, legal and illegal logging, and expansion of large scale agro-industry, including production of soya beans for export and cattle ranging. Deforestation is particularly acute in Peru and is exacerbated by illegal logging and subsistence agricultural practices. Peru's national government has established a number of protected forest areas, but these are threatened by weak regulation and illegal activity.<sup>120</sup> Lack of opportunities for alternative profitable agriculture for indigenous population whose livelihoods depend on protected forest areas induce them to practicing illegal logging in conjunction with outside loggers which, in addition to environmental effects, also weakens community organisations and their ability to develop alternative activities.<sup>121</sup>

### *Biodiversity*

The Andean region is considered one of the most ecologically diverse areas in the world and contains more perhaps 20 percent of the world's biodiversity. The adoption by the Community of the 'Regional Biodiversity Strategy' has provided a framework for joint and coordinated action to achieve the goals of the Strategy.<sup>122</sup>

The expansion of production and trade in agricultural and agricultural processed products that results from the proposed EU-Andean trade agreement will have potentially adverse biodiversity impacts. In particular, any additional pressure on the rate of deforestation represents an immediate threat to biodiversity. Similarly, the conversion of pristine habitats and natural resources to agricultural production and mining would also have significant negative implications for biodiversity.

If the expansion of commercial agriculture involves use of GMO and intensified use of scarce natural resources (land and water), the impact of the EU-Andean trade agreement is predicted to be potentially negative for the rich biodiversity of Andean country members.<sup>123</sup> Biodiversity is also threatened by rapid changes in land use,<sup>124</sup> which modifies not only land use but also water

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<sup>120</sup> OUSTR, 2005

<sup>121</sup> See, for instance, P. Oliart's presentation on the Amaraekeri reserve in Madre de Dios (Peru) at [www.manchester.ac.uk/sed/research/seminars](http://www.manchester.ac.uk/sed/research/seminars)

<sup>122</sup> Andean Community, 2005

<sup>123</sup> Inurritegui and others (2008, pp. 50).

<sup>124</sup> Office of the U.S. trade representative (2005).

allocation, which in turn has territorial implications.<sup>125</sup> A potential negative impact on biodiversity is not only important because of ecological considerations but also for the impact on vulnerable groups – often small farmers and indigenous groups whose food security and livelihoods depends on a diversified crop portfolio. However, as it has also been suggested, a trade agreement that facilitates the development of market niches for non-traditional agriculture<sup>126</sup> – together with accompanying measures to help small farmers to enter into selective European markets (of organic food, fair trade and the like) can produce positive impact on both biodiversity conservation and improvement of rural population’s livelihoods.

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<sup>125</sup> In many areas of the Peruvian and Ecuadorian Andes, competition for natural resources oppose intensive to extensive agriculture, as well as it does between mining and agriculture. The same can be said with regards to hydrocarbons and gathering/hunting activities in the rainforests of Peru, Ecuador and Bolivia.

<sup>126</sup> Inurritegui and others (2008), Camacho and others (2008).

### 3.3 Industrial Products

#### 3.3.1 Economic Impacts

##### *Real Output*

The industrial sector accounts for about one third of GDP in the Andean countries. The share of total employment ranges from 18% in Bolivia and Colombia to 24% in Peru. Industrial growth has been rapid in recent years in all four countries (table 33).

<b>Table 33: Industrial Sector in Andean countries</b>				
	<b>Bolivia</b>	<b>Colombia</b>	<b>Ecuador</b>	<b>Peru</b>
<b>Industrial Sector as % of GDP (2007)</b>	31.5	29.3	34.9	35.2
<b>Industrial Employment as % of Total Employment (2007)</b>	18.8	18.8	21.2	23.8
<b>Industrial Sector Growth (%)</b>	3.3	4.3	4.0	4.2

Source: World Bank, 2009

Similarly to the results in agriculture, there are no major changes occurring in the sectoral output in the EU. For most of the sectors output remains unchanged under the different scenarios.

For Bolivia the most pronounced change occurs in 'machinery and equipment'. Although the change is 31%, the sector's total value-added is only about 0.4%. Thus the 30% increase in the output in this sector will only have a small effect. The textiles sector also experiences a rather high increase in output, however, similarly to machinery and equipment, this sector is relatively minor, contributing to total value added of only 0.2%.

In the case of Colombia, similarly to Bolivia, there are some sectors with important changes under all the scenarios. In the case of Bolivia, these sectors are very small representing only a small fraction of total value added. This is the case, for example of the sectoral output changes in the 'motor vehicles and parts' in Colombia. The sector's output increases by 25% under the most comprehensive scenario, however, the sector's share in total value added is smaller than 0.5%.

For Ecuador, important changes in sectoral output occur only in sectors which are small and therefore these effects are only marginal.

There are no significant sectoral changes taking place in the manufacturing sectors in the Peruvian economy. The output of 'other machinery and equipment' sector contracts by 4-6% depending on the scenario while metal production expands by about 3-5%.

<b>Table 34: Manufactured goods: Sectoral changes in output (per cent), (share of value added in brackets)</b>					
<b>Sectors</b>	<b>EU 27</b>	<b>Bolivia</b>	<b>Colombia</b>	<b>Ecuador</b>	<b>Peru</b>
<b>Textiles</b>	-0.0236 (0.5)	20.7646 (0.2)	7.1795 (0.4)	-1.1642 (0.9)	3.2865 (2.6)
<b>Wearing apparel</b>	-0.0616 (.5)	4.0994 (0.7)	2.0969 (0.7)	-0.6445 (0.9)	3.4165 (1.4)
<b>Leather products</b>	-0.0614 (0.2)	7.6686 (0.4)	-1.975 (0.1)	1.0356 (0.3)	0.1128 (0.8)
<b>Wood products</b>	0.0248 (0.6)	1.267 (0.9)	-5.7884 (0.1)	-0.3782 (0.6)	-0.5102 (1.9)
<b>Paper products, publishing</b>	0.0658 (1.6)	-0.3188 (0.5)	0.3412 (1.1)	-0.3969 (0.6)	-3.9977 (1.9)
<b>Petroleum, coal products</b>	0.0495 (0.1)	1.9132 (0.4)	0.3107 (0.5)	1.0395 (1.1)	0.3998 (0.1)
<b>Chemical, rubber, plastic prods</b>	-0.0365 (2.6)	-5.2163 (0.5)	8.1577 (2.8)	0.9876 (0.8)	5.4777 (4.5)
<b>Mineral products nec</b>	0.0226 (0.9)	2.321 (1.2)	2.2029 (0.9)	-1.5245 (0.6)	0.0292 (1.3)
<b>Ferrous metals</b>	-0.0405 (0.5)	5.3528 (0.0)	5.9641 (0.8)	-1.0257 (0.0)	0.4116 (0.0)
<b>Metals nec</b>	-0.2066 (0.3)	6.9868 (0.0)	6.0387 (0.5)	3.4408 (0.0)	5.3078 (2.2)
<b>Metal products</b>	0.0123 (1.6)	3.0643 (0.1)	0.8076 (0.4)	-1.3064 (0.2)	-0.8471 (0.9)
<b>Motor vehicles and parts</b>	0.0161 (1.7)	0.9965 (0.0)	24.5056 (0.4)	-24.0723 (0.1)	-1.2096 (1.1)
<b>Transport equipment nec</b>	-0.0792 (0.5)	6.8707 (0.1)	6.3844 (0.2)	-0.6967 (0.1)	-0.4346 (0.5)
<b>Electronic equipment</b>	-0.0509 (0.8)	0.5865 (0.0)	6.1907 (0.1)	2.2619 (0.1)	-0.4993 (0.7)
<b>Machinery and equipment nec</b>	0.0346 (3.6)	31.1406 (0.4)	-1.4746 (0.8)	-4.2777 (0.3)	-5.5556 (2.4)
<b>Manufactures nec</b>	0.0753 (0.8)	3.9209 (0.7)	-2.6214 (0.5)	-3.2143 (0.6)	-1.1497 (3.0)

*Employment*

Table 35 shows the percentage changes in employment (skilled and unskilled) for the comprehensive long run scenario (scenario 2b). The employment changes mirror the changes in output shown in table 34. In Bolivia, employment increases in most manufacturing sectors, particularly in textiles and other manufactures, although these sectors are small in terms of share of national value added. Chemicals and rubber products show a decline in employment. Colombia shows a significant increase in motor vehicles and parts. In Ecuador, motor vehicles and parts record a decline of more than 20 percent. In Peru, there are small increases in employment in textiles, chemicals and other metal products.

<b>Table 35: Skilled labour employment effect per sector, % change</b>					
<b>Sectors</b>	<b>Skilled labour</b>				
	<b>EU 27</b>	<b>Bolivia</b>	<b>Colombia</b>	<b>Ecuador</b>	<b>Peru</b>
<b>Textiles</b>	-0.0385	18.5189	6.23	-0.8356	3.1489
<b>Wearing apparel</b>	-0.0739	3.7462	1.8487	-0.376	2.8049
<b>Leather products</b>	-0.0736	6.9322	-1.7128	1.1283	0.2772
<b>Wood products</b>	0.003	1.1884	-5.4199	-0.1338	-0.2819
<b>Paper products, publishing</b>	0.0417	-0.3491	-0.1638	-0.1493	-3.5351
<b>Petroleum, coal products</b>	0.0207	1.123	-0.2969	0.8459	0.3283
<b>Chemical, rubber, plastic prods</b>	-0.0504	-4.6262	6.1878	1.004	4.8484
<b>Mineral products nec</b>	0.0025	2.0474	1.4169	-1.1628	0.1328
<b>Ferrous metals</b>	-0.0539	4.4723	4.992	-0.6854	0.4873
<b>Metals nec</b>	-0.2046	5.8253	5.0509	3.3509	4.7378
<b>Metal products</b>	-0.0051	2.2008	0.5279	-0.9312	-0.6098
<b>Motor vehicles and parts</b>	-0.0003	0.4955	21.3241	-22.1366	-0.9341
<b>Transport equipment nec</b>	-0.0888	5.3501	5.3757	-0.37	-0.183
<b>Electronic equipment</b>	-0.0629	0.124	5.729	2.1142	-0.3389
<b>Machinery and equipment nec</b>	0.0171	24.6098	-1.6236	-3.6437	-4.8834
<b>Manufactures nec</b>	0.05	3.8013	-2.3907	-2.6632	-0.8929

Table 36 shows similar changes for employment of unskilled labour.

<b>Table 36: Unskilled labour employment effect per sector, % change</b>					
	<b>Very Comprehensive trade agreement Long Run</b>				
<b>All countries</b>	<b>Unskilled labour</b>				
<b>Sectors</b>	<b>EU 27</b>	<b>Bolivia</b>	<b>Colombia</b>	<b>Ecuador</b>	<b>Peru</b>
<b>Textiles</b>	-0.0265	17.6848	5.5591	-1.3323	2.7132
<b>Wearing apparel</b>	-0.0619	3.0147	1.2051	-0.875	2.3707
<b>Leather products</b>	-0.0616	6.1786	-2.3342	0.6218	-0.1466
<b>Wood products</b>	0.015	0.4747	-6.0182	-0.634	-0.7033
<b>Paper products, publishing</b>	0.0538	-1.0521	-0.7948	-0.6494	-3.9429
<b>Petroleum, coal products</b>	0.0327	0.4098	-0.9272	0.3409	-0.0957
<b>Chemical, rubber, plastic prods</b>	-0.0384	-5.2994	5.5171	0.4982	4.4056
<b>Mineral products nec</b>	0.0145	1.3277	0.7759	-1.6579	-0.2904
<b>Ferrous metals</b>	-0.0419	3.7358	4.3287	-1.1829	0.0627
<b>Metals nec</b>	-0.1926	5.0794	4.3873	2.8335	4.2955
<b>Metal products</b>	0.0069	1.4801	-0.1075	-1.4274	-1.0298
<b>Motor vehicles and parts</b>	0.0117	-0.2133	20.5592	-22.5279	-1.3528
<b>Transport equipment nec</b>	-0.0768	4.6075	4.7101	-0.869	-0.6048
<b>Electronic equipment</b>	-0.0509	-0.5823	5.0612	1.6029	-0.7601
<b>Machinery and equipment nec</b>	0.0291	23.7333	-2.2456	-4.1265	-5.2856
<b>Manufactures nec</b>	0.0621	3.0694	-3.0079	-3.1508	-1.3117



### 3.3.2 Social Impacts

#### *Poverty and Inequality*

The CGE model results are not well suited for social impact assessment due to their lack of disaggregated information at the household level. However, the model does give estimates of the equilibrium effects on skilled and unskilled labour wages in each of the Andean countries. The estimates for scenario 2b are shown in Table 37.

	<b>Unskilled</b>	<b>Skilled</b>
<b>Bolivia</b>	1.3	0.6
<b>Colombia</b>	0.9	0.3
<b>Ecuador</b>	0.0	0.5
<b>Peru</b>	0.7	0.3

The figures in table 37 indicate that unskilled wages are predicted to increase more rapidly than skilled wages, which suggests a positive impact on lower income households and on intra-sectoral inequality.<sup>127</sup> The longer term impact on poverty by increased of output and employment in the manufacturing sector may be more positive as trade liberalisation raises investment and the longer term growth trajectory, allowing for improvements in poor household income. However, economic growth does not guarantee poverty reduction, and a pro-poor growth outcome is dependent on the quality and focus of public policy and governance. Positive effects on the textiles and leather sectors of Bolivia, Colombia and Peru may help to reduce urban poverty because of the extensive presence of SME. It can also be expected that higher output of Colombia's textiles and motor vehicles sectors will produce positive chain effects on other manufacturing sectors composed mainly by SME and, therefore, reduce vulnerability of urban workers. By the same token, output reduction in Peru's machinery and equipment sector, and Ecuador's automotive sector would increase urban unemployment and rise the risks of increasing poverty.

#### *Health and Education*

Cross country evidence indicates that trade liberalisation is typically associated with a marked decline in trade tax revenue.<sup>128</sup> The lowering of tariffs on imported manufactures from the EU would be expected to reduce import revenues, unless mitigated by an offsetting increase in other taxes. A reduction in social expenditure could then occur.

<sup>127</sup> These estimates are derived from the assumption that overall employment remains constant. If we allow for the lengthy adjustment period (until 2018) and the number of workers who will be required to shift between industrial sectors (shown in table 23), it is likely that significant income losses will be incurred during the adjustment period, as workers are forced to join the pool of unemployed. Many urban households are already close to the poverty level and a lengthy period of unemployment will push the affected households closer to or below the poverty level.

<sup>128</sup> IMF 2005

Untreated water discharge will increase in those industries that are expected to expand their production following trade liberalisation. The textiles sector is a heavy polluter of water, if regulation is weak, and is likely to have a significant negative impact in Bolivia. In Peru, significant increases are predicted for chemicals, rubber and plastics and metals, again traditionally heavy polluting industries. Air pollution from industry (particularly metal foundries, brick production and oil refineries) can also be expected to increase as a result of industrial sector growth. Any increase in air and water pollution will impact negatively on health standards, particularly in urban areas.

There may be offsetting positive impacts in so far as air and water pollution will fall in those industries that are expected to reduce their output levels as a result of EU-Andean trade liberalisation.

### **3.3.3 Environmental Impacts**

#### *Environmental Quality*

Production levels are expected to increase in some industries and decline in others (Table 25). In the absence of detailed sub-sector studies, it is difficult to assess the overall environmental impact of the changes in the industrial sector that follow from EU-Andean trade liberalisation. The principal environmental effects will occur through any consequential changes in water and air pollution, both of which are already at already at high levels in the Andean countries.

In the longer term, improved access to environmental goods and services as a result of the trade negotiations for goods and services, is expected to contribute to improvements in pollution control. But the potential gains to be made in this area will be conditional on accompanying improvements in the enforcement and compliance with environmental regulation and controls.

#### *Natural Resources*

Any expansion in natural resource based industries will increase demand for raw materials and highlights the need for effective regulation and management to ensure the long term sustainability of natural resource stocks.

#### *Biodiversity*

The impact of industrial sector changes in output on biodiversity will be transmitted through the pressure on natural resources. Any expansion of wood and paper products can be expected to impact on biodiversity, if increased demand for timber is supplied from non-sustainable sources.

## 3.4 Services

### 3.4.1 Economic Impacts

The performance of the services sector is an important contributor to economic growth. The availability of efficient financial services, for example, has been shown to be a key input to economic advancement. Infrastructural services are also an essential factor for rapid economic growth. Environmental services are increasingly important in managing environmental outcomes of economic growth. Similarly, the competitiveness of firms in open economies is determined in part by access to low-cost and high-quality telecommunications, transport and distribution services, and financial intermediation.

The lowering of barriers to trade in services can contribute significant static efficiency gains in terms of allowing foreign suppliers to provide lower cost services to the domestic market. Increased openness to international trade in services also offers large potential benefits through dynamic effects on overall economic performance. Services liberalisation can also deliver significant gains in terms of sustainable development and poverty reduction, by raising investment in basic infrastructure and improving the quality of the services delivered.<sup>129</sup>

The EU has adopted a GATS approach to services liberalisation in its regional and bilateral trade negotiations.<sup>130</sup> In principle, GATS covers all commercial tradable services, with the exception of some aspects of air transport such as traffic rights, and services supplied under government authority. The WTO Secretariat has drawn up a list of twelve groups of service sectors, which is used in the negotiation of commitments by most WTO member countries.<sup>131</sup> These are:

- business (including professional and computer) services
- communication services
- construction and related engineering services
- distribution services
- educational services
- environmental services
- financial (insurance and banking) services
- health-related and social services
- tourism and travel-related services
- recreational, cultural and sporting services
- transport services
- other services not included elsewhere

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<sup>129</sup> Adlung 2007

<sup>130</sup> As opposed to a NAFTA approach which is based on a negative list scheduling modality.

<sup>131</sup> WTO (1999)

The CGE model used in this study uses a similar but not identical categorisation of service sub-sectors and provides estimates of the impact of the different scenarios, for the following sub-sectors:

- Utilities
- Construction
- Distribution
- Other Transport
- Maritime
- Air transport
- Communications
- Financial services
- Insurance
- Business services
- Recreational and other services
- Public service and dwellings

CGE modelling of services liberalisation faces a number of challenges. Many of the barriers to trade in services are hard to quantify and this increases the unreliability of the resulting estimates of the effects of trade liberalisation. Also, the debates about liberalisation in services concentrate on rule changes, such as the removal of particular regulations, rather than the lowering of trade barriers by a given percentage. A further complication is that the impacts of a particular measure extends beyond the trade effects and can have significant impacts on domestic policy and national autonomy.

Modelling studies are not well suited to take into account the highly differentiated nature of services and the linkages to domestic regulatory policy. The nature of liberalisation in services is fundamentally different to liberalisation in goods. In the latter case, the discussion centres on changes in the level of effective trade barriers expressed in quantitative terms. In the case of services, liberalisation is mainly about qualitative measures, such as regulation changes, which have to be converted to quantitative equivalents in order to be modelled. Second, most services are consumed at the point of production, which means that trade in services is closely linked to movement of capital and labour.<sup>132</sup>

The modelling study estimates NTBs for services trade as part of the experiment baseline definition. The basic methodology for estimation of services barriers involves the estimation of a bilateral gravity equation for services trade, where country importer fixed effects terms are used (once controlled for GDP, income etc) to estimate potential trade cost reductions linked to services NTBs.

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<sup>132</sup> Stiglitz and Charlton (2006)

The estimated service trade cost averages for the Andean countries are:<sup>133</sup>

- Bolivia – 30%
- Colombia – 25%
- Ecuador – 26%
- Peru – 24%

### *Real Output*

Based on these service trade cost averages, the model provides the following estimated changes in services, for the comprehensive, long run scenario (scenario 2b - Table 30). The table shows that the change in the utilities sector is positive in each of the Andean countries. The impact in the financial services sector is negative in all countries except Peru (the related insurance services sector declines in all four countries). Similarly, business services are predicted to be negatively impacted. Construction services are predicted to increase as a result of an EU Andean trade agreement. Distribution, which is the largest services sub sector, accounting for between 6 and 10 percent of GDP, declines in Ecuador but expands in the other three countries. Communications (mainly telecommunications) shows significant expansion in all countries except Peru.

<b>Table 38 Change in Services Output (%) and (percentage value added in brackets) for Scenario 2b</b>					
	<b>EU 27</b>	<b>Bolivia</b>	<b>Colombia</b>	<b>Ecuador</b>	<b>Peru</b>
<b>Utilities</b>	-0.01 (1.7)	5.98 (0.8)	5.97 (2.0)	0.82 (1.2)	0.52 (1.3)
<b>Construction</b>	0.02 (6.2)	1.77 (3.1)	1.77 (7.4)	0.23 (8.8)	0.58 (13.6)
<b>Distribution</b>	-0.02 (13.1)	4.5 (8.7)	4.45 (13.2)	-0.69 (12.7)	0.42 (3.2)
<b>Other Transport</b>	0.036 (3.7)	1.21 (7.8)	1.21 (4.1)	0.10 (6.3)	-0.07 (3.2)
<b>Maritime</b>	0.055 (0.5)	0.12 (0.4)	0.12 (0.1)	0.39 (1.0)	-1.06 (0.2)
<b>Air transport</b>	0.08 (0.4)	-4.33 (1.4)	-4.33 (0.3)	-9.58 (0.7)	-2.25 (0.5)
<b>Communications</b>	-0.01(2.2)	5.32 (1.3)	5.32 (1.6)	5.26 (1.9)	-0.95 (2.1)
<b>Financial services</b>	0.003 (2.7)	-3.10 (4.2)	-3.10 (2.6)	2.21 (2.0)	-0.83 (2.6)
<b>Insurance</b>	0.05 (1.0)	-19.81 (1.1)	-19.82 (0.7)	-14.8 (0.1)	-10.43 (1.1)
<b>Business services</b>	0.015 (19.0)	-8.51 (2.7)	-8.52 (3.0)	-10.21 (3.7)	-2.31 (6.1)
<b>Recreation and other services</b>	0.061 (3.8)	-10.26 (0.8)	-10.26 (1.8)	-13.03 (0.8)	-0.13 (7.6)
<b>Public service and dwelling</b>	-0.005 (22.7)	2.03 (28.2)	2.03 (33.1)	2.31 (14.8)	0.37 (8.9)

<sup>133</sup> Francois, Hoekman and Woertz, 2007

Similarly to results in the other sectors, there are no important changes occurring in the services sectors' output in the EU.

In Bolivia, a number of the services sectors experience a drop in their output which is mainly due to increased competition from EU service providers.

For Colombia, changes in the output of services sector is very limited with the exception of business services and recreation services. Output in both of these sectors drop by 4-9% depending on the scenarios which is due to increased competition from EU service providers. However, both of these sectors are relatively small in Colombia, business services represent about 3% of value added and recreation services about 2%.

In Ecuador, the changes in the output of services sector is very limited with the exception of business services, insurance, and recreation services. Output in all three of these sectors drop, the biggest decrease occurring in insurance services, in which sector output drops by 15% under the long run scenarios. Nevertheless, both the insurance and recreation service sectors are small in Ecuador, with less than 1% of total value added. Only the business services sector is a bigger sector with about 4% of total value added in total value added of Ecuador. These decreases in the sectoral output are due to the increasing competition resulting from reduction in barriers in the service sectors.

Finally, there are no significant output changes taking place in Peru after the different trade agreement scenarios. The only high change occurs in the insurance sector, which represents 1.1% of value added.

#### *Fixed capital formation*

Liberalisation within the EU-Andean agreement is expected to lead to greater competition from EU providers in the Andean countries, particularly in banking, insurance, telecommunications, computer and related services, distribution services, and construction and engineering services.

The EU is the leading investor in the Andean countries, accounting for more than a quarter of total foreign direct investment in the region. EU direct investment in the Andean countries has significantly increased in the last few years, with EU companies taking part in privatisation processes of services, in the financial system, manufacturing, mining and oil activities. The opening of services sectors to EU companies can be expected to encourage further European investment in establishing a commercial presence in the Andean economies.

### *Employment*

The changes in employment will follow the change in output shown in table 30. There is likely to be some growth in demand for more skilled labour in the telecommunications and financial services whereas an expansion in construction and tourism will be reflected in increased demand for less skilled labour.

For the EU, the benefits from services liberalisation are likely to be related mainly to the increased European investment in the Andean economies. This will generate increased profits for European investors and may also create employment opportunities for skilled European employees in establishing and managing a commercial presence in the Andean region.

### Services Liberalisation and Regulation

There are close linkages between international trade rules to liberalise trade in services and regulatory frameworks for services (telecommunications, transport, water, electricity, financial services).<sup>134</sup> There is an inherent tension between services trade liberalisation and services regulation. The GATS recognises governments' rights to regulate 'for services supplied in the exercise of government authority', although there is uncertainty on the interpretation of the requirement that a service is provided 'neither on a commercial basis' nor 'in competition with one or more services providers'.

An example of this potential conflict between services trade liberalisation and domestic regulatory objectives is found in the utilities services sector, particularly water services. Private sector involvement may result in increased prices (to ensure financial viability) or a concentration of investment and provision in areas of high population or income. As a result, if policies to ensure universal service at affordable prices are not put in place as part of the regulatory framework, the access of the poor to essential services may not improve with increased private sector participation.<sup>135</sup> Fears that privatisation would produce negative effects on local population are a potential source of conflict, as the "war of water" in Bolivia illustrates.<sup>136</sup>

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<sup>134</sup> UNCTAD 2009

<sup>135</sup> Kirkpatrick et al (2007); Kirkpatrick and Parker (2005)

<sup>136</sup> Perreault 2006

### **3.4.2 Social Impacts**

#### *Poverty and Equity*

With effective domestic regulatory control, market opening in the basic utilities sector improves access for the poor to affordable and reliable services in water, energy, communications and transportation.

Liberalisation of distribution may result in some reduction in prices for consumers. An accompanying increase in food retailing concentration may have a damaging effect on small scale family owned shops.

#### *Health and Education*

There is a substantial body of evidence showing that such improvements in the quality and access to basic water and sanitation services leads to positive impacts on the health of the consumer. In addition, the expansion of water utilities and increased access to clean water in rural areas would have a direct impact on women's and children's workload.

### **3.4.3 Environmental Impacts**

#### *Environmental quality*

Services liberalisation is expected to increase the utilisation of environmentally efficient technologies and management techniques. It may also raise pressure on government authorities to improve environmental regulation and enforcement, however, liberalisation of distribution services could lead to goods being sourced from a wider area, with consequent adverse impacts on local pollution and climate change associated with increased transportation.

#### *Natural resources*

Greater use of environmentally efficient management techniques and technologies will tend to reduce pressures on consumption of water and other resources. The impact is not expected to be significant in relation to other effects in this area.

#### *Biodiversity*

No significant impacts on biodiversity have been identified from services liberalisation.



#### 3.4.4 Selected Services Sub-Sectors

The project terms of reference require the analysis to depict the current situation of service sectors such as *telecom, financial services, construction services and distribution services* and to identify the potential for development of these services to business and private consumers, the potential for increased FDI, the potential impact on the development of the economy and to identify potential bottlenecks for development.

This section of the report provides a preliminary analysis for telecommunications, financial services, construction services and distribution services.

##### Telecommunications

The Andean Committee of Telecommunications Authorities (CAATEL) agreed to liberalize all telecommunications services, except for sound broadcasting and television, starting on January 1, 2002.

Communications services, particularly telecommunications, play an increasingly important role in enhancing business competitiveness in the Andean countries. As suggested by the Mattoo et al (2001) study on growth rates, improving communications can make a major contribution to economic development. Significant gains can be made either through liberalisation or private investment. The international evidence suggests that the liberalization of telecommunications sector will be most successful when it is accompanied by effective regulatory institutions.<sup>137</sup> Additional efficiency gains may be available from regulatory convergence with the EU, however, careful management would be needed to ensure that the potential convergence benefits outweigh the costs of negotiation, transition and compliance.

##### Financial services

GATS defines financial services as insurance and insurance-related services, and banking and other financial services (excluding insurance). The estimates in Table 38 show that, with the single exception of Ecuador, financial services liberalisation would have a negative impact on the output of financial services industries in the Andean countries. The impact on insurance services is negative in all four countries. The EU-Andean negotiations aim for additional commitments for liberalisation of trade in financial services beyond those that have been made through the WTO under GATS.

Within the EU, the integration of financial services markets has been progressing across the board, but at a very different pace for different products and end-users. Wholesale markets are generally characterised by a high level of integration, while retail financial markets remain nationally fragmented.

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<sup>137</sup> Wallsten, 2001

A Commission White Paper of 2005 set out objectives in financial services policy for the period to 2010, with emphasis on financial integration and increased coherence and consistency in regulation and supervision. A review carried out in 2007 recognised that greater integration can strengthen competition and offer better opportunities for financing and risk diversification, but identifies risks associated with corresponding structural changes in the financial system. In parallel with measures for increased convergence within the EU, the review calls for the development of adequate safeguards to ensure financial stability.

The Andean countries have suffered from several financial crises in the past decade. These have had significant consequences for their financial systems, which vary from country to country. The opening of the financial services market to European banks and finance institutions is expected to produce an initial decline in domestic financial services, except in Ecuador, but in the longer term there may be positive impacts from the contribution of the financial sector to economic growth.

Financial services liberalisation can have either a beneficial or adverse effects on the risk of financial instability, depending on the effectiveness of regulatory mechanisms. The potential benefits of liberalisation, however, could be outweighed if the risk of instability were allowed to rise. Effective mitigation measures may therefore be necessary in order to avoid major adverse effects in all the Andean countries.

#### Construction services

The impact of EU Andean services liberalisation is predicted to be positive in all four countries. Construction and civil engineering are essential components of many aspects of development and can help to generate large economic benefits. Gains would come largely from productivity improvements or reduced economic rents as a result of increased competition in the domestic market. Relaxed entry requirements may result in a small loss of employment of Andean professionals, but salary differentials would limit this effect. Given that this sector concentrates an important share of unskilled urban labour force, which also absorbs temporary migrants from rural areas,<sup>138</sup> the expected impact of its expansion is likely to have positive effects on poverty reduction.

#### Distribution services

Distribution services account for a significant share of GDP in all four Andean countries (Table 30). Market opening is predicted to have a positive impact in all countries except Ecuador, where a decline of less than percent is predicted.

The scenario for services would expand the ability of EU distribution companies to establish outlets in the Andean countries, which would experience welfare gains from increased economic efficiency and potential reductions in consumer prices.

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<sup>138</sup> Roderick et al 2008

The number of small traders in the Andean countries can be expected to decline, with a smaller number of jobs becoming available in new, less labour intensive, outlets. The welfare gain will come mainly from lower consumer prices, particularly for higher income urban communities.<sup>139</sup> Effective competition policy may be needed to prevent cartelisation and anti-competitive behaviour.

Significant reduction of recreation and services to business sectors in Ecuador, Bolivia and Colombia may impact negatively urban unemployment. A reduction of the insurance sector in all countries may reduce the opportunities of the poor to access to this service, already restricted to middle and higher income segments.

In the longer term, liberalisation can be expected to improve the effectiveness of those distribution services which supply modern industrial and commercial equipment to other sectors of the economy. This may have a significant beneficial long term effect on Andean growth rates.

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<sup>139</sup> Arkell and Johnson 2005

## 3.5 Other Trade Areas under Negotiation

### 3.5.1 Investment

The inclusion of investment in trade negotiations is intended to minimise the conditions and regulations on foreign investors entering and operating in the host countries, improve the transparency and consistency of the regulations that are applied to foreign investors, and to grant them national treatment.<sup>140</sup> The underlying premise in favour of an investment agreement is that it will increase the flow of foreign investment. In addition, by improving investor protection and confidence, domestic investment may also be stimulated.<sup>141</sup> Proponents of investment agreements argue, therefore, that the improvement of the investment 'climate' and the liberalisation of investment would be of mutual benefit to both parties in the trade agreement. The empirical evidence on the economic impact of investment provisions in regional trade agreements is generally positive.<sup>142</sup>

The inclusion of investment provisions in trade agreements can be contentious, as it may limit domestic policy autonomy if it includes legally binding protection for foreign investment.<sup>143</sup> Latin America received record levels of foreign direct investment in 2007, exceeding the previous record set in 1999 (in the context of one-off privatisations). This surge in FDI was mainly fuelled by transnational corporations seeking to take advantage of the growth in local market demand and gain access to natural resources. in light of buoyant world demand.<sup>144</sup> Hydrocarbons and mining have been among the main sources of investment. There is sizeable variation, however, in both the scale and trend in FDI flows to individual countries, reflecting differences in domestic market potential, natural resource endowments and government policy towards foreign investment.

Improving the quality of investment inflows and harnessing the benefits of FDI for local development through capacity building in the area of regulation and competition policy and the development of the institutional conditions necessary to maximise the spillover from FDI activity has been identified

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<sup>140</sup> Te Velde and Fahnbulleh, (2006) identify the following areas that can be covered in an investment agreement: Investment promotion and cooperation, liberalisation and market access, and investment protection.

<sup>141</sup> However, the evidence in support of the 'crowding in' effect of FDI on domestic investment is weak (Agosin, 2008)

<sup>142</sup> Dee and Gali (2003) find that FDI responds positively to the non-trade provisions within RTAs. Similarly, Te Velde and Bezemer (2006) find that regions with more investment provisions provide US and UK investors with positive signals about how different regions will treat them. Furthermore, the type of regional grouping matters for attracting FDI (i.e. whether or not the RTA includes certain trade and investment provisions). The OECD (2006) finds that investment provisions in RTAs are positively associated with both trade and investment flows.

<sup>143</sup> UNCTAD, 2006

<sup>144</sup> ECLAC, 2008a

as an important issue for the region.<sup>145</sup>

Table 39 shows the differences in the scale of FDI inflows to the Andean countries.

<b>Table 39: Foreign Direct Investment Inflows, 2005-07 (\$million)</b>			
	<b>2005</b>	<b>2006</b>	<b>2007</b>
<b>Bolivia</b>	-288 *	281	204
<b>Colombia</b>	10,240	6,464	9,028
<b>Ecuador</b>	493	271	178
<b>Peru</b>	2579	3467	5343
<b>South America</b>	44,305	43,102	71,699

\*Bolivia data records net investment ie inflows less disinvestments

Source: UNCTAD, 2008

Foreign investment has been more pronounced in the mining sector than in the hydrocarbons sector, where local State oil companies have a strong presence and changes in the regulatory frameworks may have made FDI more volatile. Some of the challenges facing mining companies are related to legal uncertainty (especially regarding taxation) and from the effects that mining activities have on local communities and the environment.<sup>146</sup> In Ecuador, for example, the main copper deposits, in Mirador and Junin, are situated in highly vulnerable areas, both in environmental terms and from the viewpoint of local indigenous communities.<sup>147</sup> The challenge is to develop a regulatory framework to provide for sustainable mining practices that benefit the local communities and provide profitable investment opportunities.

The nationalisation process in Bolivia, announced in 2006, and the renegotiation of contracts with private companies and changes to the extraordinary income tax legislation for the hydrocarbons sector in Ecuador are examples of measures that Andean countries have taken to ensure the exploitation of oil and gas reserves generate greater benefits for the local economy. However, such measures have made the Andean countries less attractive to some foreign investors.

### **Economic Impacts**

The EU is the leading investor in the Andean Region, accounting for a significant share of total foreign direct investment in the region. EU FDI is found in the financial services, mining, oil extraction and manufacturing sectors. Given the substantial inflow of FDI to Andean countries, the impact of an investment agreement may be muted. However, if an agreement resulted in greater investor confidence, particularly in the oil and gas and mining sectors, there could be some increase

<sup>145</sup> ECLAC, 2008

<sup>146</sup> UNCTAD, 2007

<sup>147</sup> ECLAC, 2008

in European investment into these sectors. An investment agreement might also act as a signal to non- EU investors. The additional inflow of FDI that can be attributed to the agreement is unlikely to be significant, but any agreement can be expected to stabilise the long term flow of FDI. Over time, the inflow of new FDI is expected to contribute to economic growth.

An investment agreement is expected to have positive impact on foreign direct investment and may also have a 'crowding in' effect on domestic investment. The increase in growth resulting from FDI inflows is expected to have a positive long term impact on employment

### **Social Impacts**

In the long run, the increase in real income attributable to higher FDI inflows may have an indirect trickle down effect on poverty. Better fiscal redistribution mechanisms could improve the poverty status of local communities adjacent to mining and oil projects. An inflow of FDI into the basic utilities sector is also likely to contribute to poverty reduction, provided that domestic regulatory offices are able to regulate for accessibility and affordability criteria in the delivery of services by private utility operators.<sup>148</sup> An investment agreement is not expected to have a significant impact on equity.

If FDI results in 'learning by doing' and skills enhancement externalities, the quality of the labour force may be positively affected. Similarly, if the health safety standards in foreign owned enterprises are superior to domestic enterprises, there may be some marginal improvements in health for employees.

### **Environmental Impacts**

The impact of increased FDI on the environment has been widely discussed in the literature, particularly in the context of pollution havens and a 'race to the bottom'.<sup>149</sup> It is evident an increase in FDI inflows which increases output will give rise to negative environmental impacts unless these are mitigated or prevented by an effective environmental regulatory capacity. As described in the baseline conditions section, environmental regulation enforcement is weak in the Andean countries. It can be predicted that any increase in FDI that is attributable to an investment agreement, will have adverse environmental consequences.

FDI in manufacturing activities can be expected to increase air and water pollution, the scale of which will be determined by the investment-induced increase in production levels. There is also

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<sup>148</sup> See, Kirkpatrick and Parker 2007

<sup>149</sup> Kirkpatrick and Shimomoto, 2007

evidence to suggest that FDI can introduce improved environmental control technology, thereby contributing to improvements in environmental quality. FDI in environmental services can also contribute positively to environmental quality.<sup>150</sup>

An investment agreement is not expected to have any significant impacts on biodiversity.

### 3.5.2 Public Procurement

Government procurement is arguably the largest trade sector sheltered from multilateral disciplines. It was initially excluded from the GATT; Article III (national treatment) does not apply to procurement. With the completion of the Tokyo Round on multinational trade negotiations in 1979, a code of conduct for central government procurement, known as the Agreement on Government Procurement (GPA), was introduced into the GATT. The code bound only its signatories and most GATT contracting parties did not join. During the Uruguay Round the coverage of the agreement was expanded to include services and additional government entities. Transparency in government procurement was re-introduced as part of the WTO negotiation agenda at the Singapore Ministerial meeting in December 1996, as one component of the so-called 'Singapore issues' (the other 'behind-the-border' Singapore issues related to multilateral rules for competition, trade facilitation and investment). In July 2004, the World Trade Organization (WTO) General Council decided not to launch negotiations on new multilateral rules on transparency in government procurement (or competition and investment). Multilateral disciplines on government procurement remain subject, therefore, to the amended plurilateral Government Procurement Agreement (GPA) which came into force in 1996. The agreement regulates public tenders in a way to guarantee the transparency of procedures and to ensure equal treatment for domestic and foreign suppliers. None of the Andean Countries are parties to the GPA.

The European Union has identified the absence of multilateral disciplines in the field of public procurement as a serious constraint on the ability of EU companies to compete for government contracts in areas such as transport equipment, public works and utilities, and seeks to improve the terms of access to procurement markets outside the EU for EU exporters.<sup>151</sup> To achieve this, the EU aims to negotiate access to procurement markets through its bilateral trade agreements and free trade agreements (FTAs), by encouraging third countries to negotiate substantial commitments with the EU.

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<sup>150</sup> George, Kirkpatrick and Scricciu, 2006

<sup>151</sup> [http://ec.europa.eu/trade/issues/sectoral/gov\\_proc/index\\_en.htm](http://ec.europa.eu/trade/issues/sectoral/gov_proc/index_en.htm)

Estimates of the size of public procurement by state bodies in goods and service in a sample of 106 developed and developing countries find that for the OECD countries, the total value of government procurement market is estimated at USD\$4,733 billion and for the non-OECD countries it is estimated at USD \$816 billion .<sup>152</sup> The role of government procurement of goods and services typically accounts for 10-15 per cent of GDP of developing countries and around 20 per cent of GDP in developed countries. In the EU, the procurement market is worth €1600 bn or over 16% of GDP.<sup>153</sup>

Developing countries have in the past consistently opposed the inclusion of government procurement in the WTO negotiation agenda on the grounds that the scope of the issues is unclear and that they lack the technical and institutional capacity to comply with international tendering procedures. However, that position has more recently begun to shift, possibly in recognition of that fact that every country in the world already has some rules governing public expenditure, and also on account of the potential benefits in terms of governance and money saved which enhanced transparency may generate. A number of developing countries have therefore engaged in negotiations on transparency, if not also coverage.

Resistance to GPA compliance may also be based on more fundamental concerns about the potential damaging effects on the development process. Procurement policies may be part of an industrial policy or an instrument to attain social objectives (e.g. support for small and medium sized enterprises, minority-owned businesses, disadvantaged ethnic groups, or certain geographic regions) through set-asides and preference policies.<sup>154</sup> In addition, a government's ability to procure from firms of its own choice can be an instrument of macroeconomic management. There is the concern that premature or over-rapid opening of government procurement markets will allow large foreign firms to drive out local firms before increasing prices, similar to predatory dumping. However, there is also growing awareness that it may be possible to address these issues within a procurement chapter, to the mutual satisfaction of all Parties involved.

Furthermore, most developing countries are unlikely to gain a significant share of the government procurement market in the developed country partner's market. Many developing countries' competitive advantage continues to lie in the provision of labour intensive services. However, as emerging economies increasingly diversify, their exporting interests grow more varied. Developing countries can compete in the supply of goods required by hospitals, defence and other public organisations (eg, office furniture and equipment, textile products, shoes, tyres and other rubber products) , however the lack of information and experience in responding to tender invitations can prevent suppliers in developing countries from accessing this market.

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<sup>152</sup> OECD, 2003

<sup>153</sup> EC (2004)

<sup>154</sup> Stiglitz and Charlton, 2005



On the other hand, as tender information is increasingly published in several languages in central databases free of charge on the internet, access becomes easier for smaller companies. Suppliers from developing countries are increasingly active in the EU procurement market.

Liberalisation of government procurement remains a complex issue, and a move towards a rule based agreement may be perceived by some stakeholders as a potential weakening of domestic policy autonomy. However, as an increasing number of developing countries are engaging in public procurement reform, there is likely to be an increasing opportunity to test the validity of these arguments.

### **Public Procurement Policies in the Andean countries**

Bolivia enacted a new law on public procurement in 2004, aimed in particular at making public procurement a more efficient and transparent process. However, the new regime continues to give Bolivian companies and products preferences, which in some cases is linked to national content. Foreign companies wishing to bid for government consulting contracts must do so in association with a Bolivian company.<sup>155</sup>

Colombia's public procurement regime does not differentiate between domestic and foreign firms. However, certain provisions require a more favourable evaluation of offers that contain Colombian goods and services, or foreign goods and services that incorporate Colombian added value.<sup>156</sup>

Ecuador's current legislation enables it to limit tendering to domestic companies and restricts the participation of foreign consulting firms, except when the necessary expertise and capacity is not available locally. Efforts are being made to enhance transparency in government procurement.<sup>157</sup> Since 2000, important policy changes have been made to the regulatory framework on government procurement in Peru. Peruvian legislation grants a 20% preference margin to bidders that use Peruvian goods, and certain programmes (eg food aid) specify that only domestic food products be acquired.<sup>158</sup>

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<sup>155</sup> WTO, 2005

<sup>156</sup> WTO, 2007

<sup>157</sup> WTO, 2005a

<sup>158</sup> WTO, 2007a

## **Economic Impacts**

There are two potential sources of benefit from liberalisation of government procurement (Evenett, 2003). First, as a result of the transparency requirements the government will be required to demonstrate better value for money in its contracting and purchases. More generally, greater transparency will contribute to improved governance. It is estimated that the introduction of the Internal Market reforms in the EU significantly improved the performance of public procurement markets over the past decade. Public procurement directives have effectively increased transparency and resulted in an estimated saving of 30% or more in public finances, despite the fact that direct cross border procurements remain low. Second, exports could expand as a result of purchases of goods and services by governments in the partner countries.

Ideally, there would be a robust evidence base to substantiate the claims made regarding the potential negative and positive impacts associated with government procurement reform in developing countries. Unfortunately, with the notable exception of the study published in 2004 by the European Commission demonstrating significant potential for cost savings (some 30%), to date, there is not enough solid evidence on the effect of liberalising government procurement markets. This being said, there is a widely held view that opaque procurement practices are a significant source of corruption, and a key obstacle to a sustainable management of public finances.

An agreement on greater transparency in Andean governments' procurement procedures may generate gains from increased competition for government contracts. Further economic efficiency gains might be expected to result from the improvement in the quality of public sector governance. The 'demonstration effect' of improvements in transparency and accountability in government procurement may spillover in improvements in other areas of public regulation and policy affecting the private sector. Consumers are likely to benefit from an improvement in the quality of goods and services provided by the state.

There may be additional gains to Andean exporting firms if an agreement assists these firms in competing for public sector contracts for the supply of goods and labour services, in the EU countries. These economic gains would need to be compared to any benefits foregone in terms of developing domestic productive and technological capacity through the use of government long term contracting with local producers as an instrument of industrial strategy. In addition, a procurement framework which is perceived as more reliable and transparent by operators could also be a driver to attract more innovative inward investments.

## Social Impacts

The liberalisation of government procurement could have an impact on the use of procurement to support SME development or regional development. However, it is unlikely that the economic gains from the liberalisation of government procurement could immediately be secured by the fiscal system and redistributed to support these goals. On the other hand, the money saved on more efficient procurements would become available for other important policy objectives such as social policy issues. Over time, tax revenues from corporate taxation could increase as the dynamic effects of liberalisation of government procurement are realised in terms of increased economic performance and growth in the private sector. On the other hand, those groups who depend heavily on goods and services provided by the state are likely to benefit from the improvement in the quality of these goods that is engendered by the liberalisation of public procurement rules. However, given the restrictions for SME to access to government procurement bids<sup>159</sup> competition from larger foreign firms may hinder employment in the SME sector and increase the risks of the potential displaced labour force to fall in poverty.

## Environmental Impacts

The reforms to government procurement procedures are not expected to have any significant environmental impacts.

### 3.5.3 Trade Facilitation

The CGE model explicitly involves trade costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as the costs of the physical activity itself. In addition, there are frictional trading costs that represent real resource costs associated with producing a service for sale in an export market instead of the domestic market. The modelling results are derived from an assumed reduction of overall trade costs, 1% of the comprehensive scenario, 3% for the very comprehensive scenario. The model results show significant welfare gains for trade facilitation reforms that result in a reduction in trade costs. Other modelling studies of trade facilitation as part of trade liberalisation also indicate significant gains.<sup>160</sup>

There is a broad consensus that trade facilitation does have the potential to contribute significantly to smoother and intensified trade between countries, particularly in terms of eliminating burdensome trade procedures, increasing transparency, improving business opportunities and

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<sup>159</sup> Yeng and Cartier 2003

<sup>160</sup> Engman (2005).

security, and generally enhancing competitiveness and economic development to the benefit of both the government and the private sector.<sup>161</sup> Landlocked countries in particular can expect to benefit from reduced border delays and transit costs.

In order to reap the potential benefits, many developing countries have embarked on customs modernisation unilaterally as part of a broader programme of reforms, with assistance from international agencies such as the World Bank and UNCTAD<sup>162</sup>. Experience suggests that factors essential for success includes 'properly identifying problem areas and coherently designing reform programs.'<sup>163</sup>

These considerations suggest that trade facilitation does offer significant potential economic benefits although these cannot be quantified with any certainty. They are probably fairly small in the short term, but may make a significant qualitative contribution to longer term development processes. Effective technical assistance is likely to make an important contribution in ensuring that the benefits outweigh the costs.

Recent data on the costs and constraints for trade across borders in the Andean countries suggests that there are significant gains to be realised from a reduction in trade facilitation costs incurred by exports and importers. Table 40 shows that all four countries are in the bottom half of country rankings for costs of trading across borders, suggesting that there are likely to be significant gains from trade facilitation reforms.

	<b>Documents for export (number)</b>	<b>Time for export (days)</b>	<b>Cost to Export (US \$ per container)</b>	<b>Documents for import (number)</b>	<b>Time for Import (days)</b>	<b>Cost to import (US\$ per container)</b>	<b>World Bank Ranking ( 1-181)</b>
<b>Bolivia</b>	8	19	1425	7	23	1747	117
<b>Colombia</b>	6	14	1690	8	15	1640	96
<b>Ecuador</b>	9	20	1345	7	29	1332	124
<b>Peru</b>	7	24	875	8	25	895	93

Source: World Bank, 2009

<sup>161</sup> Hellqvist (2003), Ivanow and Kirkpatrick (2007)

<sup>162</sup> OECD (2005b)

<sup>163</sup> OECD (2003)

**Economic Impacts**

The main economic benefit to the Andean countries will be in the efficiency gains from customs and related procedural reforms. These gains can be expected to contribute to an improvement in the business environment and will facilitate the growth of investment and employment in exports production. An increase in imports could contribute to additional employment opportunities in port handling and distribution activities. There could also be gains in economic efficiency associated with a reduction in rent seeking activities. The size of these gains will be lower, however, in the short run, as in terms of employment retrenchment and as financial costs are incurred in implementing the reforms. The potential gains from trade liberalisation will also be reduced if they are not accompanied by a reduction in domestic regulatory barriers to private sector development.

**Social Impacts**

The social impacts associated with trade facilitation are unlikely to be significant and will be directly related to the economic impacts. There will be some direct employment effects associated with the stimulation of trade flows, but the main social impacts are expected to occur in the long term from the trickle-down effects of trade expansion and accelerated economic growth in reducing poverty levels and raising household incomes. Taking in account that in the last decade or so the significant growth experienced in all Andean countries has had little impact on poverty reduction, for a trickle-down effect to happen social and pro-poor growth policies will have to accompany trade policies.

**Environmental Impacts**

The environmental impacts of trade facilitation reform are not expected to be significant. The growth in trade movements may have some impact on air quality. Any secondary effect, through induced expansion or upgrading of transport infrastructure can be expected to have a negative impact on natural resources and biodiversity. In the long term, the increase in economic growth linked to trade facilitation may improve access to, and adoption of, environmental goods and services which would have an offsetting positive environmental impact.



## 4. CONSULTATION ACTIVITIES

### 4.1 SIA Website

The EU-Andean Trade SIA project has produced a project website to support the project's visibility and generate stakeholder feedback. The website can be accessed at [www.euandean-sia.org](http://www.euandean-sia.org) and feedback can be sent to [enquiries@euandean-sia.org](mailto:enquiries@euandean-sia.org).

The SIA website has received 6,954 hits from 869 unique users over the period February-March 2009.



Figure 1 - The Spanish language version of the EU-Andean SIA website

The website is available in both English and Spanish and contains all relevant information concerning the SIA's progress, reports, minutes, background information, current related news items, and contact information of the consortium partners. The website has been designed to facilitate the SIA's target audience and wider stakeholders' access to the project's latest research in a user-friendly version and encourage the provision of feedback.

As of the end of March 2009, in excess of 30 specific emails on areas involving substantial research coverage had been received. The top five key issues raised in the correspondence include:

1. Clarification of research methodology, particularly the quantitative approaches to be used for economic assessment
2. Impacts on the Andean agriculture sector from further trade liberalisation
3. Environmental circumstances in the Andean that should be considered by the study, with a focus on biodiversity and climate change impacts
4. The current trade barriers in relation to banana exports between the two regions
5. Consultation processes with civil society, including details for the Local Workshop.

The feedback received to date represents a wide range of sources including research think tanks, non-government organisations, academic institutions, industry groups and civil society actors. The comments received have been collated by the project team for assessment and inclusion in

assessment and evaluations where appropriate. The project team actively encourages feedback on the Draft Interim Technical Report for consideration in the further assessment and policy work to be included in the draft final report.

#### 4.2 Electronic SIA-Trade Newsletter

As part of the project's consultation activities, an EU-Andean Trade SIA newsletter will be disseminated electronically to the consultation network at key points during the project, coinciding with the release of each report and other project deliverables. Downloadable from the project website, the newsletter will include a summary of the project's progress and results, and provide updates on notable economic, social or environmental news events in the region.

Pending the release of the first edition of the newsletter, an email was sent to the stakeholder network encouraging users to register their details online and provide feedback on the SIA process and core sustainability issues from a local perspective.

Following the publication of the Draft Interim Technical Report, a newsletter will be disseminated to the stakeholder network prepared and contacted in the earlier stage of the project and continues to be expanded through further consultations as the project's research proceeds.

#### 4.3 Consultation Workshops

The first civil society workshop was held in Brussels on 30 January 2009 to establish a dialogue and to gather the views of interested parties (business, local public administrations and civil society in particular). A copy of the minutes from this meeting is available online at [www.euandean-sia.org](http://www.euandean-sia.org). In addition, a full one-day consultation workshop with local project stakeholders will be held in Lima, Peru on 26 May 2009. The key outcomes and feedback from these workshops will be incorporated into the development of impact enhancement and mitigation measures in the draft final report of the study.



Figure 2 - An email to the stakeholder network encouraging stakeholders to subscribe to the newsletter and provide comments on SIA



#### **4.4 Interviews**

A further round of interviews will be conducted in the final phase of the project, following distribution of the Draft Interim Technical Report via email and the project website to the stakeholder network. Stakeholders will be contacted for telephone or face-to-face interviews as appropriate. The first round of interviews conducted in the early stages of Phase Two of the Project were not as informative or authoritative as hoped by the research team, as many of the respondents first wanted to examine the key research assessments prior to commenting on impacts. A key lesson learnt in the project research to date is interviews based on the Inception Report are more process related than substantive impact related. This will be corrected through follow-up interview rounds. The project team have maintained regular communication with key interviewees and will re-engage with these important stakeholders following the approval to publish the Draft Interim Technical Report. This stage of the project is expected to constitute the most direct form of stakeholder engagement in the project. Using a standard list of questions, the interviews will be the main form of high-level consultation with the business communities and governments of the Andean countries. The interview responses to date have focused on feedback and recommendations on key issues to cover which have been included where appropriate in the report, however, a further round on impact considerations will be re-launched.

#### **4.5 Questionnaires**

Following the analysis of consultation from the research team from the first round of interviews, it was determined that a questionnaire would be most effective following the publication of the Draft Interim Technical Report. This approach is designed to provide stakeholders with a key understanding of the preliminary assessment for their feedback to be incorporated in the additional research impacts to be undertaken by all research teams. In the latter stages of the study, questionnaires will be distributed in both hard copy and electronically via the SIA website to coincide with the public release of the Draft Interim Technical Report. The survey design will solicit both quantitative and qualitative data from an expanded spectrum of industry, NGOs and civil society. The project newsletter will also include a questionnaire for stakeholders to return.

#### 4.6 Stakeholder consultation network

Below is a table of stakeholders for consultation by the project teams as part of the EU-Andean SIA. As the study progresses and the website generates publicity, additional stakeholders will be added to the list.

<b>Table 44 – Stakeholder consultation network</b>		
	<b>Horizontal issues</b>	<b>Secotral Issues</b>
<b>Colombia</b>	<p><b>Social Foundation</b> Social Foundation is a non-for-profit organization which works on altering the structures which cause poverty in Colombia. Its active research fields such as local and regional integral development, and human rights.</p> <p><b>Network on Inequality and Poverty, Latin America</b> The LACEA/IDB/World Bank Network on Inequality and Poverty is a joint initiative that aims to promote knowledge and expertise regarding the causes and consequences of poverty, inequality, and social exclusion, and the whole range of policies, institutions, and social structures that influence their dynamics as well as the impact of public action. The network has national chapters in fifteen countries in Latin America.</p> <p><b>Ser Investigation Institute</b> Instituto SER de Investigación (ISI) is a private, non profit Colombian institution created in 1973. It fights and resolves social problem and creates new projects related with the services that the state offers (education, health, justice administration, public administration, regional and urban development, assistance to local governments). The multidisciplinary research; the institute develops is specialized on quantitative methodologies. Since the year 2002 ISI has worked along side with the Universidad de los Andes. The institute’s mission is to inquire on the social reality and promote changes and innovations that will improve the welfare of the population, and especially of those less</p>	<p><b>The Colombian Confederation of Chambers of Commerce - CONFECAMARAS</b></p> <p><b>Colombian Flower Export Association</b></p> <p><b>Colombian National Association of Manufacturers</b></p>

	<p>protected sectors.</p> <p><b>Corona Foundation</b></p> <p>Corona Foundation is a private organization which supports research initiatives regarding institutional strengthening in education, health, entrepreneurial development and local development.</p> <p><b>International Centre of Tropical Agriculture</b></p> <p>CIAT is a non-profit organization that conducts socially and environmentally progressive research aimed at reducing hunger and poverty and preserving natural resources in developing countries. To this effect, the center cooperates with many national and international institutions in developing and industrialized countries in the form of networks and consortia.</p>	
Peru	<p><b>The Economic and Social Research Consortium, Peru</b></p> <p>CIES is a research and training organization that is concerned with economic and social policy in Peru. Areas of focus include: poverty, gender and quality of life employment, income distribution and social policy public education: equity and quality issues the environment and natural resources health reforms and human rights</p> <p><b>Institute of Development and Environment</b></p> <p>IDMA is a private non profit organization which aims to contribute to human and sustainable development by means of improvement of local</p>	<p><b>Association of Banana Producers Peru</b></p>

and regional environments. The institute tries to contribute from environmental perspective to the following: improvement of the quality of human life, democratization of the society, decentralization of the country, social and gender equity. On a more focused level, the institute is concerned with small farmers and aims to achieve: rural sustainable development, poverty alleviation, cooperation between rural and urban communities

**Science and Technology Coordinator of the Andes, Peru**

CCTA is an NGO which works on networking institutions dedicated to the promotion of human development, with a focus on rural areas in the Peruvian Andes. CCTA is involved mainly with farm communities and small farmers in the mountains, as well as rural and urban-marginal sectors of the Coast of Peru. CCTA works on two central themes: science, technology and rural development, and appropriate technologies for Andean ecosystems.

**Institute for Freedom and Democracy**

ILD focuses on creating modern legal frameworks that empower the poor of the developing and ex-communist world by providing them with a legal property system which allows them to turn their assets into leverage-able capital.

**Citizens Proposal Group**

Grupo Propuesta Ciudadana (GPC) is a consortium of 11 NGOs working in 9 regions of Peru. Its focus is State reform, with emphasis on decentralization and participation. GPC's work is organized in four areas of activities: participation in local and regional consensus building mechanisms, legislative initiatives to the Congress, monitoring of national, regional and local government's performance communications

	<p><b>Research Center for Development and Participation, Peru</b></p> <p>CEDEP is a specialized civil association which focuses on the articulation of social and productive processes.</p>	
<b>Ecuador</b>	<p><b>Faro Group</b></p> <p>Grupo Faro is a civil society organization that creates spaces for action within the population to influence public policies at local and national level. Grupo FARO strives to become a diverse forum that contributes to the dissemination and implementation of ideas for the public wellbeing. They work to bridge civil society and policy-makers and to disseminate information necessary for a social, economic and political transformation of Ecuador.</p>	<b>National Autonomous Institute of Agriculture Inquiry</b>
<b>Bolivia</b>	<p><b>Andean Centre for the Management and Use of Water</b></p> <p>This center is part of the Faculty of Agricultural and Husbandry Sciences of the Universidad Mayor San Simón, and it aims to contribute to the formation of professionals in the fields of irrigation and integrated management of water resources, responding to the needs of the Andean region and Bolivia as a whole.</p> <p><b>Fundación TIERRA</b></p> <p>TIERRA foundation is a private development institution, founded in 1991, with a focus on farming, specializing in alternative ideas and proposals for sustainable rural development and equitable access to natural resources. Its activities include: research, formulation of proposals, capacity building, communication, management, technical support, promoting participation of peasants and indigenous people in political decision making, working with government bodies and non-government organizations.</p>	
<b>EU and Multi-country</b>	<p><b>Asociacion Latinoamericana de Organizaciones de Promocion al Desarrollo a.c.</b></p> <p>ALOP is an association of non-governmental development organisations from 20 countries of Latin America and the Caribbean. Established in</p>	<b>Association of American Chambers of Commerce in Latin America (AACCLAL) Chamber of the Americas</b>

	<p>1979, ALOP is one of the most long-lasting efforts of integration of NGOs in the region. Within its objectives, ALOP aims at building and facilitating meeting and exchange spaces for its members in the perspective of mutual learning in order to elaborate proposals for global, local and sectorial development and work towards establishing proactive relations with all actors on the Latin-American (LA) and Caribbean development scenario.</p> <p><b>Overseas Development Institute</b>          ODI is Britain's leading independent think tank on international development and humanitarian issues. Our mission is to inspire and inform policy and practice which lead to the reduction of poverty, the alleviation of suffering and the achievement of sustainable livelihoods in developing countries.</p> <p><b>Analysis Group of Development</b>          In 1980, a team of Peru's social scientists formed the Group for Analysis and Development (GRADE), a private, nonprofit research center. They strived to establish a think tank which could contribute to Peruvian and Latin American development through rigorous research and analysis of key economic, environmental and social issues.</p>	<p><b>European Fruit and Vegetable Trade Association</b></p>
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## 6. ANNEXES

### Annex 1: Environmental Baseline Indicators

Table 1:

	Source	Bolivia	Colombia	Ecuador	Peru
Surface Area (sq. Km) (Thousands)	1	1,098.6	1,141.8	283.6	1,285.2
Surface Area (1.000 hectares)	2	108438	110950	27684	128000
Forest Area (sq. Km) (Thousands)2005	1	587.4	607.3	108.5	687.4
Total Protected Area (1.000 hectares) 2004	2	11529	9647	18287	7832
Agricultural land (% of land area) 2005	1	34.8	38.4	27.3	16.6
Hydroelectric consumption (billion KWH) 2006	5	2.14	39.9	7.06	19.4
Total electricity consumption (billion KWH) 2007	6	5.092	52.8	12.9	28.97
Electricity consumption from Hydroelectric (% total electricity consumption)	-	42%	74.4%	54.7%	67%

Table 2 - Water Data:

	Source	Bolivia	Colombia	Ecuador	Peru
<b>Water use agricultural (%) 2000</b>	2	83.0	46.0	82.0	-
<b>Water use domestic (%) 2000</b>	2	13.0	50.0	12.0	-
<b>Water use industrial (%) 2000</b>	2	3.0	4.0	5.0	-
<b>Rural population with access to drinking water (%) 2004</b>	2	68.0	71.0	89.0	-
<b>Urban population with access to drinking water (%) 2004</b>	2	95.0	99.0	97.0	-
<b>Access to Improved Drinking Water<sup>164</sup> 1970 (% of population)</b>	4	33	63	34	35
<b>Access to Improved Drinking Water<sup>165</sup> 2004 (% of population)</b>	4	85	93	94	83

<sup>164</sup> **Improved water sources** include household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collections. **Unimproved water sources** are unprotected wells, unprotected springs, vendor-provided water, bottled water (unless water for other uses is available from an improved source) and tanker truck-provided water'

Table 3 - Sewerage connections:

% of population with sewerage connections	Source	1988	1989	1990	1992	2003	2005
<b>Bolivia Urban</b>	7		43.0			49.9	
<b>Bolivia Rural</b>	7		4.0			3.0	
<b>Colombia Urban</b>	7			89.0			92.0
<b>Colombia Rural</b>	7			17.0			25.0
<b>Ecuador Urban</b>	7	68.0				74.0	
<b>Ecuador Rural</b>	7	7.0				54.0	
<b>Peru Urban</b>	7				60.0		81.0
<b>Peru Rural</b>	7				3.0		8.0

Table 4 - Air quality:

	Source	Bolivia	Colombia	Ecuador	Peru
<b>Rural population using solid fuels<sup>166</sup> (%) 2003</b>	3	80.0	48.0	8.0	90.0
<b>Urban population using solid fuels<sup>167</sup> (%) 2003</b>	3	5.0	3.0	1.0	13.0

Table 5 – Urbanisation:

	Source	Bolivia	Colombia	Ecuador	Peru
<b>Population total (millions) 2007</b>	1	9.52	46.12	13.34	27.90
<b>Population growth (annual %) 1990</b>	3	2.3	1.9	2.3	2.1
<b>Population growth (annual %) 2006</b>	3	1.9	1.4	1.1	1.1
<b>Population living in urban areas (%) 1970</b>	2	35.4	49.7	39.5	-
<b>Population living in urban areas (%) 1990</b>	3	56.0	69.0	55.0	69.0
<b>Population living in urban areas (%) 2006</b>	3	65.0	73.0	63.0	73.0
<b>Urban population residing in urban agglomerations with 750,000 or more inhabitants (%) 2005</b>	2	31.0	36.0	30.0	-

<sup>166</sup> WHO – ‘The use of solid fuels in households is associated with increased mortality from pneumonia and other acute lower respiratory diseases among children as well as increased mortality from chronic obstructive pulmonary disease and lung cancer (where coal is used) among adults. It is also a Millennium Development Goal indicator.’

**Source 1:** World Bank Key Development Data & Statistics

**Source 2:** United Nations Environment Programme Early Warning and Assessment GEO Latin America and the Caribbean Data Portal

**Source 3:** WHOSIS: World Health Organisation Statistical Information System

**Source 4:** <http://www.worldwater.org/data.html>

**Source 5:** Energy Information Administration

**Source 6:** CIA World Factbook

**Source 7:** WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation

## Annex 2. Technical Annex

### 2.1 Overview

The CGE model is based on Francois, van Meijl, and van Tongeren (2005), and is similar to World Bank, CEPII, and CPB global models. It is a multi-sector, multi-region model of the global economy. Estimated effects are based on a projected 2018 baseline. This baseline assumes a successful Doha Round as well as implementation of major regional agreements.<sup>168</sup> It is also built around medium-run macroeconomic forecasts from the World Bank, IMF, and OECD. From this baseline, we have estimated the impact, both immediate and medium-term (following investment responses) of NTM liberalisation. The immediate impact (short-run) estimates described below reflect the possible impact, on the 2018 baseline, if the relevant trade agreement was only implemented in 2018. The medium-term, in contrast, provides an estimate of how the 2018 baseline would look if the agreement had been implemented far enough in the past (approximately 7 to 10 years) so that the full set of investment impacts have already been realised. Hence, the short-run estimates are immediate, while the long-run give a sense of the difference in economic activity allowing for investment responses.

An important feature of the model involves a savings-investment-capital link, whereby the static or direct income effects of trade liberalisation induce shifts in the regional pattern of savings and investment. These effects have been explored extensively in the trade literature, including Baldwin and Francois (1999), Smith (1976, 1977), and Srinivasan and Bhagwati (1980). Several studies of regional and multilateral trade agreements have also incorporated variations on this mechanism. Such effects compound initial output welfare effects over the medium-run, and can magnify income gains or losses. How much these "accumulation effects" will supplement static effects depends on a number of factors, including the marginal product of capital and underlying savings behaviour. In the present application, we work with a classical savings-investment mechanism (Francois et al 1996). This means we model medium- to long-run linkages between changes in income, savings, and

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<sup>168</sup> Given the aggregation scheme of the model, the background implementation of regional agreements into the baseline does not matter a great deal for the model, though full DDA implementation as discussed below does.



investment. The results reported here therefore include changes in the capital stock, and the medium- to long-run implications of such changes.

The resulting estimates can be viewed as including two sets of effects. Our short-run or static estimates correspond to the impact of an agreement as observed in 2018, if the agreement was fully introduced and implemented in 2018. The longer-term (dynamic) estimates provide an overview of the observed impact in 2018, of the agreement had already been in place for several years, such that investment effects are fully realised. Hence, the estimates with capital accumulation provide a sense of the eventual outcome from dynamic gains linked to the agreement.

The data scheme is outlined in the tables below. Original data are from GTAP7, though values are expressed in 2004 euro prices rather than dollar prices (and the database is projected.)

#### **Model Regions**

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European Union	Mercosur
Bolivia	United States
Colombia	Other LDCs
Ecuador	Rest of World
Peru	

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**Model Sectors**

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<i>Primary production</i>	<i>Manufacturing</i>	<i>Services</i>
Grains ( <i>paddy rice, wheat, cereals</i> )	textiles	utilities
vegetables, fruit, nuts	wearing apparel	construction
other primary food ( <i>oil seeds, unprocessed sugar cane &amp; beets</i> )	leather products	distribution
other agriculture ( <i>plant based fibres, crops nec, wool, silk worm cocoons</i> )	wood products	other transport
forestry	paper products, publishing	maritime
primary fishing	petroleum, coal products	air transport
primary mining	chemicals, rubber, and plastic productsss	communications
processed foods, bevs,	mineral products nec	financial services
tobacco ( <i>meats &amp; meat prods, vegetable oils and fats, dairy, milled rice, sugar, food products nec, beverages, tobacco</i> )	ferrous metals	insurance
	metals nec	business services nec
	metal products	recreation and other services
	motor vehicles and parts	public services and dwellings
	other transport equipment	
	electronic equipment	
	other machinery and equipment	
	manufactures nec	

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**2.2 General Model Structure**

The general conceptual structure of a regional economy in the model is as follows: firms produce output, employing land, labour, capital, and natural resources and combine these with intermediate inputs, within each region/country. Firm output is purchased by consumers, government, the investment sector, and by other firms. Firm output can also be sold for export. Land is only employed in the agricultural sectors, while capital and labour (both skilled and unskilled) are mobile between all production sectors. While capital is assumed to be fully mobile within regions, land, labour and natural resources are not.

Fig. A-1 Nested production structure

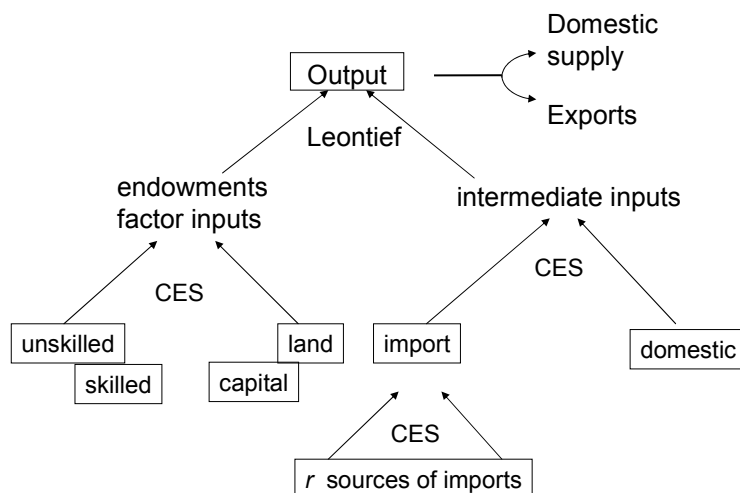
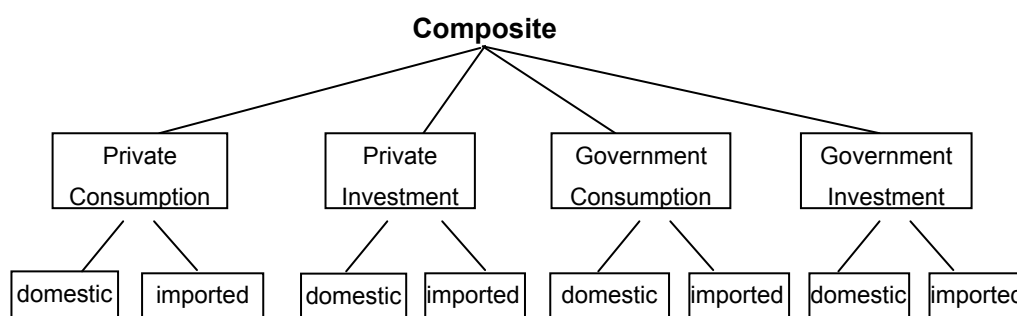


Fig. A-2 Consumption Structure



### 2.3 Taxes and policy variables

Taxes are included in the theory of the model at several levels. Production taxes are either placed on intermediate or primary inputs, or on output. Some trade taxes are modeled at the border. There are also additional internal taxes that can be placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Where relevant, taxes are also placed on exports, and on primary factor income. Finally, where indicated by social accounting data as being relevant, taxes are placed on final consumption, and can be applied differentially to consumption of domestic and imported goods.

Policy data comes from many sources. In the GTAP database, tariffs are based on HS tariff line data, from MacMAPS, the WTO, and WITS as implemented in the GTAP7 database. It is also important to note that many developing countries in the GTAP database receive significant preferences from OECD countries. These preferences are included in the baseline data. The applied tariffs, based on applied MFN and preferential rates, is implemented in the model on a trade-weighted basis by partner and sector.

Post-Doha tariff estimates are based on the range of coefficients in the recent (2008) set of Doha modalities texts (NAMA and agriculture). The problems in defining the post-Doha baseline for tariffs relate to agriculture rather than NAMA. Sensitive and special products are one of the most complex issues in the WTO negotiations. WTO members are allowed to freely choose the products they classify as sensitive, which causes considerable uncertainty about the outcome of this selection process and makes them very difficult to handle in simulations. The data we work with for the DDA in agriculture come from the German Federal Agriculture Research Institute -- the Johann Heinrich von Thünen Institute (vTI). It follows the procedure outlined by Brockmeier and Pelikan (2008).<sup>169</sup> An advantage of the 2018 baseline is that it moves us past uncertainty about when the DDA will end, and about short-run assumptions about macroeconomic conditions. It is also important to note that all the countries involved already receive significant preferences from the EU. These preferences are included in the baseline. Critically, we also assume the implementation of DDA tariff modalities on sensitive products by the EU in agriculture (bananas and sugar in particular) based on consultations with the EC on a likely outcome. The baseline scenario therefore represents a "most likely" scenario.

Services barriers come from two sources. For the Andean countries, we have gravity estimates from Francois, Hoekman, and Woerz (2007) for trade in commercial services. We have used this as the benchmark rate of protection. For the EU, we have taken estimates of EU barriers against extra-EU partners from ongoing research with DG-Trade on EU non-tariff barriers affecting trade Canada, Japan, and the United States. These estimates are more sector-specific (unpublished source: "Draft Study on EU-US Non-Tariff Measures," ECORYS led project consortium report, 2009). For the Andean countries, average trade costs in services are Bolivia 40%, Columbia 33%, Ecuador 35%, Peru 32%.

#### **2.4 Technical aspects of transport, trade facilitation, and services barriers**

International trade is modeled as a process that explicitly involves trading costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as the costs of the physical activity of transportation itself. Those trading costs related to international movement of goods and related logistic services are met by composite services purchased from a global trade services sector, where the composite "international trade services" activity is produced as a Cobb-Douglas composite of regional exports of trade and transport service exports. Trade-cost margins are based on reconciled f.o.b. and c.i.f. trade data.

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<sup>169</sup> Brockmeier, M. and J. Pekikan (2008), "Agricultural market access: A moving target in the WTO negotiations?" *Food Policy* 33: 250–259.

Frictional trading costs, is another form of trade costs known from the literature. These costs are implemented in the service sector. They represent real resource costs associated with producing a service for sale in an export market instead of the domestic market. Conceptually, we have implemented a linear transformation technology between domestic and export services. This technology is depicted in Annex Figure 1 below. The straight line AB indicates, given the resources necessary to produce a unit of services for the domestic market, the feasible amount that can instead be produced for export using those same resources. If there are not frictional barriers to trade in services, this line has slope -1. This free-trade case is represented by the line AC. As we reduce trading costs, the linear transformation line converges on the free trade line, as indicated in the figure. This approach is used for liberalization of non-tariff measures, affecting both goods and services, where they are modeled as increasing the cost of goods and services sold to trading partners.

## 2.5 Market Structure

### 2.5.1 Demand for imports: Armington sectors

The basic structure of demand in constant returns sectors is Armington preferences. In Armington sectors, goods are differentiated by country of origin, and the similarity of goods from different regions is measured by the elasticity of substitution. Formally, within a particular region, we assume that demand for goods from different regions is aggregated into a composite import according to the following CES function:

$$(1) \quad q_{j,r}^M = \left[ \sum_{i=1}^R \alpha_{j,i,r} M_{j,i,r}^{\rho_j} \right]^{1/\rho_j}$$

In equation (1),  $M_{j,i,r}$  is the quantity of imports in sector  $j$  from region  $i$  consumed in region  $r$ . The elasticity of substitution between varieties from different regions is then equal to  $\sigma_j^M$ , where  $\sigma_j^M = 1/(1-\rho_j)$ . Composite imports are combined with the domestic good  $q^D$  in a second CES nest, yielding the Armington composite  $q$ .

$$(2) \quad q_{j,r} = \left[ \Omega_{j,M,r} (q_{j,r}^M)^{\beta_j} + \Omega_{j,D,r} (q_{j,r}^D)^{\beta_j} \right]^{1/\beta_j}$$

The elasticity of substitution between the domestic good and composite imports is then equal to  $\sigma_j^D$ , where  $\sigma_j^D = 1/(1-\beta_j)$ . At the same time, from the first order conditions, the demand for import  $M_{j,i,r}$  can then be shown to equal

$$\begin{aligned}
 (5) \quad M_{j,i,r} &= \left[ \frac{\alpha_{j,i,r}}{P_{j,i,r}} \right]^{\sigma_j^m} \left[ \sum_{i=1}^R \alpha_{j,i,r}^{\sigma_j^M} P_{j,i,r}^{1-\sigma_j^M} \right]^{-1} E_{j,r}^M \\
 &= \left[ \frac{\alpha_{j,i,r}}{P_{j,i,r}} \right]^{\sigma_j^M} (P_{j,r}^M)^{\sigma_j^M - 1} E_{j,r}^M
 \end{aligned}$$

where  $E_{j,r}^M$  represents expenditures on imports in region  $r$  on the sector  $j$  Armington composite. In practice, the two nests can be collapsed, so that imports compete directly with each other and with the corresponding domestic product. This implies that the substitution elasticities in equations (2) and (3) are equal.

### 2.5.2 Imperfect competition

As indicated in Annex Table 1, we model manufacturing sectors and service sectors as being imperfectly competitive. The approach we follow has been used in the Michigan and the WTO assessment of the Uruguay Round, and many recent studies of the Doha Round (see Francois et al 2005). Recent model testing work indicates that this approach works “best” vis-à-vis Armington models, when tracked against actual trade patterns (i.e. Fox (1999), uses the U.S.-Canada FTA as a natural experiment for model testing).

Formally, within a region  $r$ , we assume that demand for differentiated intermediate products belonging to sector  $j$  can be derived from the following CES function, which is now indexed over firms or varieties instead of over regions.

$$(4) \quad q_{j,r} = \left[ \sum_{i=1}^n \gamma_{j,i,r} X_{j,i,r}^{\Gamma_j} \right]^{1/\Gamma_j}$$

Where  $\gamma_{j,i,r}$  is the demand share preference parameter,  $X_{j,i,r}$  is demand for variety  $i$  of product  $j$  in region  $r$ , and  $\sigma_j = 1/(1-\Gamma_j)$  is the elasticity of substitution between any two varieties of the good. Note that we can interpret  $q$  as the output of a constant returns assembly process, where the resulting composite product enters consumption and/or production. Equation (4) could therefore be interpreted as representing an assembly function embedded in the production technology of firms that use intermediates in production of final goods, and alternatively as representing a CES aggregator implicit in consumer utility functions. In the literature, and in our model, both cases are specified with the same functional form. While we have technically dropped the Armington assumption by allowing firms to differentiate products, the vector of  $\gamma$  parameters still provides a partial geographic anchor for production (Francois and Roland-Holst 1997, Francois 1998).

Firms in different regions/countries compete directly on a global level. Firms are assumed to exhibit monopolistically competitive behaviour. This means that individual firms produce unique varieties of good or service  $j$ , and hence are monopolists within their chosen market niche. Given the demand for variety, reflected in equation (4), the demand for each variety is less than perfectly elastic. However, while firms are thus able to price as monopolists, free entry (at least in the long-run) drives their economic profits to zero, so that pricing is at average cost. The joint assumptions of average cost pricing and monopoly pricing, under Bertrand behaviour, imply the following conditions for each firm  $f_i$  in region  $i$ :

$$(5) \quad \zeta_{j,f_i} = \sum_{r=1}^R \frac{X_{j,f_i,r}}{X_{j,f_i}} \left( \sum_{k=1}^n \left( \frac{\alpha_{j,k,r}}{\alpha_{j,f_i,r}} \right)^{\sigma_j} \left( \frac{P_{j,k,r}}{P_{j,f_i,r}} \right)^{1-\sigma_j} \right)^{-1}$$

$$(6) \quad P_{f_i} = AC_{f_i}$$

The elasticity of demand for each firm  $f_i$  will be defined by the following conditions.

$$(7) \quad \varepsilon_{j,f_i} = \sigma_j + (1 - \sigma_j) \zeta_{j,f_i}$$

$$(8) \quad \frac{P_{f_i} MC_{f_i}}{P_{f_i}} = \frac{1}{\varepsilon_{f_i}}$$

In a fully symmetric equilibrium, we would have  $\zeta = n^{-1}$ . However, the calibrated model includes CES weights  $\gamma$ , in each regional CES aggregation function, that will vary for firms from different regions/countries. Under these conditions,  $\zeta$  is a quantity weighted measure of market share. To close the system for regional production, we index total resource costs for sector  $j$  in region  $i$  by the resource index  $Z$ . Full employment of resources hired by firms in the sector  $j$  in region  $i$  then implies the following condition.

$$(9) \quad Z_{j,i} = \sum_{f=1}^{n_i} TC_{j,i,f}$$

Cost functions for individual firms are defined as follows:

$$(10) \quad C(x_{j,i}) = (a_{j,i} + b_{j,i} x_{j,i}) P_{Z_{j,i}}$$

This specification of monopolistic competition is implemented under the “large group” assumption, which means that firms treat the variable  $n$  as “large”, so that the perceived elasticity of demand equals the elasticity of substitution. The relevant set of equations then collapses to the following:

$$(11) \quad q_{j,r} = \left[ \sum_{i=1}^R \bar{\gamma}_{j,i,r} \bar{x}_{j,i,r}^{\Gamma_j} \right]^{\frac{1}{\Gamma_j}}$$

$$\bar{\gamma}_{j,i,r} = \alpha_{j,i,r} n_{j,i} 0^{1-\Gamma_j}$$

$$\bar{x}_{j,i,r} = \left( \frac{n_{j,i}}{n_{j,i} 0} \right)^{(1-\Gamma_j)/\Gamma_j} X_{j,i,r}$$

$$(12) \quad \bar{x}_{j,i} = \left( \frac{Z_{j,i} 1}{Z_{j,i} 0} \right)^{(1-\rho_j)/\rho_j} X_{j,i}$$

In equation (12),  $n_0$  denotes the number of firms in the benchmark. Through calibration, the initial CES weights in equation (12) include the valuation of variety. As a result, the reduced form exhibits external scale effects, determined by changes in variety based on firm entry and exit, and determined by the substitution and scale elasticities.



## 2.6 The composite household and final demand structure

Final demand is determined by an upper-tier Cobb-Douglas preference function, which allocates income in fixed shares to current consumption, investment, and government services. This yields a fixed savings rate. Government services are produced by a Leontief technology, with household/government transfers being endogenous. The lower-tier nest for current consumption is also specified as a Cobb-Douglas. The regional capital markets adjust so that changes in savings match changes in regional investment expenditures<sup>170</sup>.

## 2.7 Capital Accumulation and Investment

An important feature of the model involves a savings-investment-capital link, whereby the static or direct income effects of trade liberalization induce shifts in the regional pattern of savings and investment. These effects have been explored extensively in the trade literature, including Baldwin and Francois (1999), Smith (1976, 1977), and Srinivasan and Bhagwati (1980). Several studies of regional and multilateral trade agreements have also incorporated variations on this mechanism. Such effects compound initial output welfare effects over the medium-run, and can magnify income gains or losses. How much these "accumulation effects" will supplement static effects depends on a number of factors, including the marginal product of capital and underlying savings behavior. In the present application, we work with a classical savings-investment mechanism (Francois et al 1996). This means we model medium- to long-run linkages between changes in income, savings, and investment. The results reported here therefore include changes in the capital stock, and the medium- to long-run implications of such changes.

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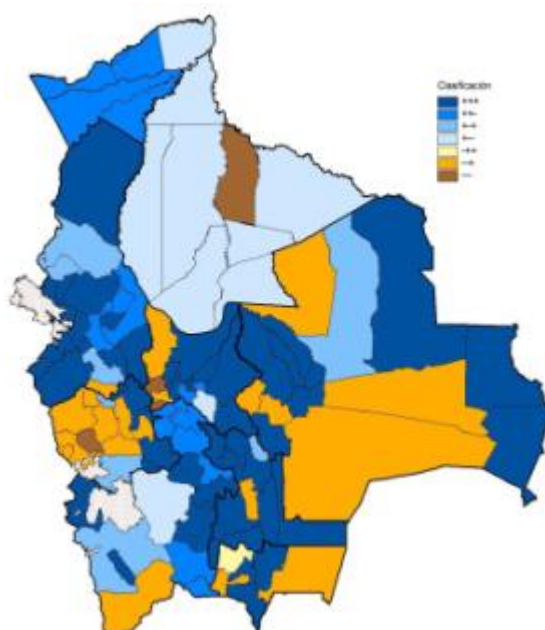
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### Annex 3: Territorial dynamics in Andean countries<sup>171</sup>

In a context of openness and globalisation, the territorial dynamics that one can observe in Andean countries is notoriously uneven. There are some territories which show processes of growth, poverty reduction and social inclusion. Those have evidently taken advantage of the opportunities of globalisation. However, next to successful cases there are situations in which every indicator of development is changing in the opposite direction. The local economy is stagnant, people are leaving due to lack of opportunities, poverty is widespread, governability is weak and sustainability is seriously threatened. In between there are territories in which the dynamics of development show mixed outcomes.

Maps 1 to 4 show the situation of each one of Andean countries from such a territorial perspective, that is taking in account that the occurrence of growth, poverty and inequality segments the national space and set the conditions under which events such as trade liberalisation may impact positively on some territories, while it might hinder others.

Map 1. Bolivia: typology of changes in consumption, poverty and inequality between 1992 and 2001

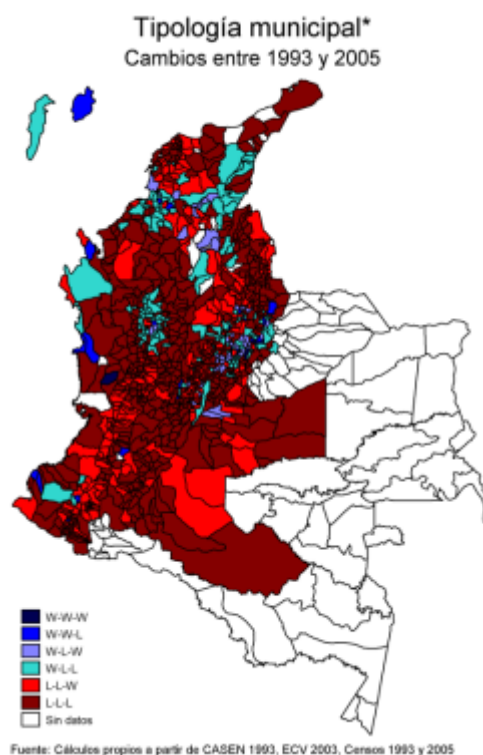


Note for the legend: from left to right each symbol indicates a positive (+) or negative (-) change in consumption, poverty or income distribution.

From: Hinojosa and others (2009).

<sup>171</sup> This section builds on research findings of the Rural Territorial Dynamics Program (RTD), coordinated by RIMISP. RTD is a research-based policy advice and capacity-development program for rural economic growth, social inclusion and environmental sustainability in Latin America. (Maps reproduced with authors permission).

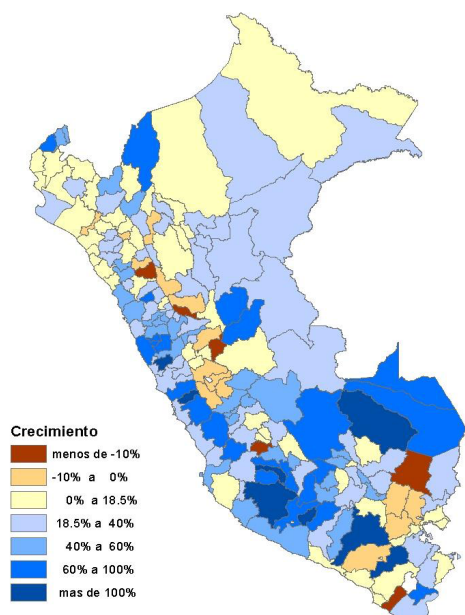
Map 3. Colombia: typology of changes in consumption, poverty and inequality between 1993 and 2005



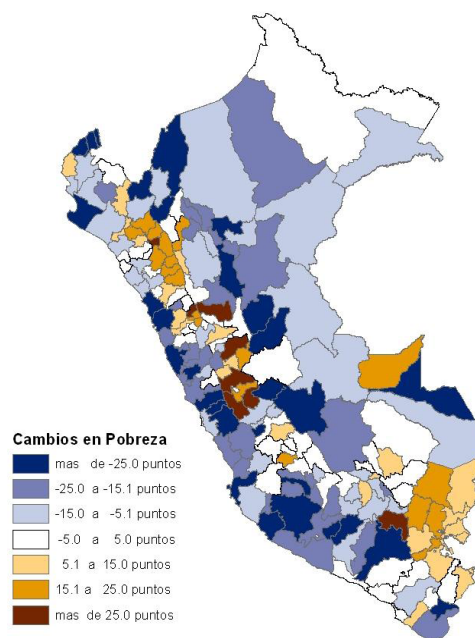
Note for the legend: from left to right each symbol indicates a positive (W) or negative (L) change in consumption, poverty or income distribution.

From: Hernandez and others (2009).

Map 4a. Peru: Change in consumption between 1993 and 2005



Map 4b. Peru: Change in poverty between 1993 and 2005



From: Escobal and Ponce (2008)