Trade Sustainability Impact Assessment of the Association Agreement to be negotiated between the EU and Central America

TRADE08/C1/C14 & C15 - Lot 2

Final Report

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CORPORATE SOLUTIONS

CENTRO DE ESTUDIOS PARA EL DESARROLLO RURAL

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List of Acronyms and Abbreviations

Abbreviation	Description
AA	Association Agreement
AHM	Maquila Association of Honduras
ALOP	Asociación Latinoamericana de Organizaciones de Promoción
ATC	Agreement on Textile and Clothing
CACM	Central American Common Market
CAWN	Central American Women's Network
CCA	Causal Chain Analysis
CDR	Centro de Estudios para el Desarrollo Rural / Stichting Rural Development Consult
CGE	Computational General Equilibrium
CMT	Cut-make and trim
CSR	Corporate Social Responsibility
DDA	Doha Development Agenda
DR-CAFTA	Dominican Republic-Central American Free Trade Agreement
DWA	Decent Work Agenda
DWCP	Decent Work Country Programme
EC	European Commission
ECLAC	Economic Commission for Latin America
EDF	Economic Development Foundation
EEA	European Environment Agency
EMSA	European Maritime Safety Agency
ESF	European Services Forum
ETS	Emission Trading System
EU	European Union
EURATEX	European Apparel and Textile Organisation
FAO	Food and Agriculture Organisation
FAP	Forest Action Plan
FDI	Foreign Direct Investment
FLEGT	Forestry Law Enforcement, Governance and Trade
FMT	Francois, Van Meijl, and Van Tongeren
FoEE	Friends of the Earth Europe
FTA	Free Trade Agreement
FTZs	Free Trade Zones
FUDI	Fundación de Desarrollo Integral
FVN	Fruits, Vegetables and Nuts
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GMM	Generalised Method of Moments

Abbreviation	Description
GSP	Generalized System of Preferences
IEA	International Energy Agency
ILO	International Labour Organisation
IMO	International Maritime Organisation
IPR	Intellectual Property Rights
ITR	Interim Technical Report
LULUFC	Land Use, Land use Change and Forestry
MFA	Multi Fibre Agreement
MT	Make and trim
NTM	Non Tariff Measure
NWFP	Non-wood forest product
NWGS	Non-wood goods and services
ODI	Overseas Development Institute
OEM	Original equipment manufacturers
PPP	Purchasing Power Parity
R&D	Research and Development
RMLIC	Rest of Middle and Low Income Countries
RoHS	Restriction on the Use of Hazardous Substances
ROW	Rest of World
SFM	Sustainable forest management
SICA	Central American Integration System
SIECA	Secretariat for Central American Economic Integration
SL	Skilled labour
SMEs	Small and Medium Enterprises
SPS	Sanitary and phytosanitary measures
SSS	Short sea shipping
T&C	Textiles and clothing
TBT	Technical Barriers to Trade
TEUs	Twenty feet Equivalent Units
ToR	Terms of Reference
TSIA	Trade Sustainability Impact Assessment
UL	Unskilled labour
UMIP	Panama International Maritime University
UN	United Nations
US	United States
VA	Value added
VPA	Voluntary Partnership Agreements
WEEE	Waste Electrical and Electronics Equipment Directive
WEI	Water Exploitation Index
WTO	World Trade Organisation

Preface

In January 2009, the ECORYS lead consortium has been contracted to perform the Trade Sustainability Impact Assessment for the trade part of the Association Agreement (AA) to be negotiated between the European Union (EU) and six Central American republics (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama). The aim of the study is to provide insight into the potential sustainability impacts (economic, social and environmental) from the trade part of the AA and to give policy recommendations, with the aim to assist the negotiation process between the EU and the Central American republics. The study entails the use of both quantitative and qualitative methods in order to determine these potential impacts. The study is performed jointly by ECORYS Nederland BV, Corporate Solutions (Spain), Centro de Estudios para el Desarrollo Rural (CDR, Costa Rica), and the Institute for International & Development Economics (IIDE).

This report is the Final Report that presents the main findings of the study, encompassing:

- An explanation of the TSIA methodology and modelling techniques used;
- An overview of sector-level modelling outcomes for the pre-defined scenarios and an interpretation of these results;
- A summary of the consultations process and inputs received;
- In-depth analyses of impacts to be expected for a set of selected sectors and issues;
- A synthesis of the main potential economic, social and environmental impacts;
- Conclusions and policy recommendations based on the determined impacts.

We have benefited greatly from internal and external experts that have provided their feedback and insights, as well as from the public meetings and bilateral consultations. We are especially grateful to the several EU and Central American civil society representatives for their active involvement and critical comments and suggestions.

The project website for this study is www.tsia.ecorys.com/ca and you can e-mail us at tsiaca@ecorys.com for further comments and suggestions for improvement.

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 an official view of the Commission.

ECORYS Netherlands BV

Executive Summary

Background to the study

The EU is engaged in promoting open trade and investment relationships with various trade partners across the world, through negotiating Free Trade Agreements (FTAs). With the Central American region of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama (the latter having an observer status only), an Association Agreement (AA) is negotiated. In order to analyse the potential **economic, social and environmental impacts** of the trade-related part of the AA, in advance of policy decision making, this study is carried out. The study has heavily involved **civil society in a dialogue on trade policy and trade policy issues**. This has been achieved by actively engaging with civil society and key stakeholders at all stages of the report development.

In the study two scenarios are identified to look at potential impacts, assuming a **'comprehensive FTA'** and a **'very comprehensive FTA'**. These two scenarios are analysed from a **short-run and long-run** perspective (the long-run includes a dynamic investment effect, the short-run does not) and – taking into account the fact Panama has observer status in the negotiations – looking at the situations where Panama is or is not part of the FTA. Further model assumptions and the detailed methodology can be found in Chapter 1.

Consultation process

Consultations with civil society form an extremely important part of the TSIA methodology and approach and we are grateful for all comments, feedback and inputs we have received. These were mainly done through public meetings in Brussels, a workshop in Managua and an ILO-hosted bipartite labour meeting in Antigua, bilateral interviews and consultations via the website. The inputs we received on issues such as sector and horizontal issue selection and important product groups, the role of regional integration in Central America, the identification of the potential environmental and social impacts of the AA on indigenous populations and other vulnerable groups, and the provision of various reports, all proved very useful to the relevance of the study.

Main Results

Table 0.1 summarises the main macro-economic results of the trade-part of the AA. The AA is **expected to be positive – economically** – for both the EU and all Central American countries and **the deeper the integration, the more beneficial the effects** are

expected to be in the long-run. In a very comprehensive FTA, per year for Central America as a whole could be €2.6 billion including Panama and €2.2 billion without it; at a national level gains range from €44 million (0.5 percent of national income) for Nicaragua to €920 million (3.5 percent of national income) for Costa Rica. The EU is expected to gain €2.3 billion per annum (+0.0 percent of EU national income).

Panama is expected to benefit from participating in the AA in terms of national income changes and trade, but not in terms of wage growth because of Dutch disease effects[1] that shift resources towards the services sector (finance, insurances & business services). For the rest of the region (CA-5) the **results do not change significantly whether Panama is included in the AA or not**.

Wages for the low-skilled and high-skilled workers in both the EU and Central America are expected to **go up** – except for Panama. The wage increases range from 0.2 percent for high-skilled workers in Guatemala to up to 3.2 percent for unskilled workers in Costa Rica. These figures are expected to be **upper-bound estimates** due to the existence of the **informal sector**. Modest **migration of workers to Costa Rica** may be the result. In Central America, special attention needs to be given to **gender equality**, **labour conditions** and **vulnerable social groups**.

The trade part of the AA has an **overall poverty-reducing effect for all Central American countries except for Panama**, but the degree of this effect differs per country. For the Central American region as a whole, the aggregated estimated effect is 0.6 percent reduction in poverty levels (in the scenario where Panama joins the AA). For Nicaragua, El Salvador and Honduras the poverty reductions are relatively most pronounced. For Costa Rica the effect is much smaller in the short run, but the largest in the long run. For Panama, the AA is expected to raise poverty levels slightly whether or not it decides to join, though far less so if Panama joins (0.2 percent compared to 1.2 percent if it does not join).

Our **trade flow analysis** shows that trade – both imports and exports – will **increase significantly**, leading to more specialisation between the EU and Central America and within Central America. The largest sectoral gains are expected in the fruits, vegetables and nuts (FVN) sector, especially for Panama and Costa Rica, but also slightly in the other countries. Guatemala and Nicaragua become more competitive in textiles & clothing, a sector that is declining in Costa Rica and Panama, while for electronics, we expect a shift from Nicaragua and Panama to Costa Rica, El Salvador, Honduras and Guatemala. Similarly, the processed foods sector (including for example processed fish products), is expected to decline in Panama and Costa Rica and to see growth in Nicaragua, Guatemala, El Salvador and Honduras. Nicaragua also sees increases in exports in chemicals and other machinery equipment while El Salvador and Honduras are expected to increase their exports in other transport equipment. The only exception to this

[1] Dutch disease relates to the negative consequences on the functioning of the rest of the economy, as aresult of large increases to a country's income from one source, causing an increase in its currency value (as a result of large increase in foreign currency from FDI, foreign aid or a substantial increase in natural resource prices). The name stems from the exploitation of large natural gas reserves in the Netherlands, resulting in this economic phenomenon that caused a decrease in competitiveness and thus exports of manufactured goods and an increase in imports. In other words, non-resource industries are hurt by increase of wealth generated by resource-based industries.

trade growth picture is Panama that sees growth in FVN and financial services but a decline in most other sectors.

Table 0.1 Summary of macroeconomic changes (long-run very comprehensive FTA)*

Scenario / variable	CRI	NIC	GTM	ES	HON	PAN	EU-27	LDC	ROW
Scenario 2c: Very comprehensive FTA (long run. including Panama)									
National income (% change)	3.5	0.5	0.6	1.6	2.2	1.3	0.0	0.0	0.0
National income (€ million)	919.4	44.3	368.3	502.2	422.3	380.8	2,286.4	82.0	-411.6
Unskilled wages (% change)	3.2	0.9	0.7			-0.5	0.0	0.0	0.0
Skilled wages (% change)	2.8	0.6	0.2			-0.8	0.0	0.0	0.0
Total exports (% change)	17.7	3.4	4.6	4.2	8.2	14.2	0.1	0.0	0.0
Total imports (% change)	20.9	2.0	2.8			10.9	0.1	0.0	0.0
Scenario 2d: Very comprehensive FTA (long run. excluding Panama)									
National income (% change)	3.5	0.5	0.6	1.6	2.2	0.0	0.0	0.0	0.0
National income (€ million)	925.3	47.6	347.9	503.1	423.1	-5.9	2,018.9	29.4	-671.4
Unskilled wages (% change)	3.2	0.9	0.7			0.0	0.0	0.0	0.0
Skilled wages (% change)	2.8	0.6	0.2			0.0	0.0	0.0	0.0
Total exports (% change)	17.8	3.6	4.8	4.3	8.4	-0.1	0.1	0.0	0.0
Total imports (% change)	21.1	2.1	2.8			-0.1	0.1	0.0	0.0

* CRI = Costa Rica, NIC = Nicaragua, GTM = Guatemala, ES = El Salvador, PAN = Panama, HON = Honduras, LDC = Least Developed Countries, ROW = Rest of World

The FTA causes **limited increases in CO_2 emissions** (+0.0 percent of global GHG emissions) and more so for the EU than the Central American countries.

Resource (land) use is expected to change towards FVN at the expense of livestock and grains. Overall pressure on land use could increase if effects of mining, deforestation and biofuels production are taken into account.

Foreign Direct Investments (FDI) are important: they generate additional positive dynamic effects (for example for iron and steel in Panama, plastics and pottery in Guatemala and non-electrical machinery and iron and steel in Nicaragua) leading – overall – to an increase of economic value added of 0.5 percent in Central America.

Main sustainability impacts

Economic impacts

The national income effects are positive for the EU and all Central American countries (see the Table above) at the aggregate level. At sector level there is a slight decline in EU output for FVN and electronics (which could be regionally concentrated). Specialisation occurs in Central America especially with respect to textiles & clothing and electronics. Some secondary effects may be important. For example, the potential secondary effects of increases in maritime services (i.e. better infrastructure in ports) may allow some Central American economies to manage increased trade flows while smoothening customs procedures. The degree of regional integration is important for the potential benefits from the AA because more regional integration – leading to lower cross-border

NTMs and more regulatory harmonisation – would allow the Central American countries to benefit more.

Investments and FDI are expected to increase and benefit both the Central American countries and the EU– on top of the predicted national income gains. Important to note is that – again – the potential gains are heavily dependent on regional integration in Central America (a regional approach to investment conditions would help significantly). Dispersion of investment and FDI flows into more domestically focussed SMEs instead of only the large export-oriented firms can help make benefits more inclusive.

Trade flows show shifting comparative advantages. Most pronounced are fruits, vegetables & nuts (FVN), textiles & clothing, electronics, other machinery and maritime transportation services.

Social impacts

Social impacts are linked to economic effects. Employment effects in the EU are expected to be negligible, though for FVN and electronics, some regions may be adversely affected to a limited extent. Employment opportunities in the Central American region shift more strongly, caused by workers being drawn into sectors that offer higher wages, either from sectors where no comparative advantages exist or from the informal sector. This effect occurs in all Central American countries except Panama. In Panama wages are going down in the long run, meaning that – overall – unemployment may go up as sectors shed labour.

The AA can stimulate the improvement of labour standards as EU firms make higher demands on Central American exporters and EU investors adhere to the ILO Decent Work Agenda. This is under the proviso that firms in the Central American region do not lower wages and standards in a competition for scarce FDI and thereby start a 'race to the bottom' in labour regulations. Policy initiatives in this field have a large influence over which effect may come to dominate.

Migration towards sectors that will grow (and offer higher wages) is expected. In the long run this will be beneficial for the economies in Central America and (to a lesser extent because the effect is much smaller) in the EU. However, in the short run, the transition process may come with (adjustment) costs in some regions or sectors, the more so for vulnerable social groups and for female employment. This short-run effect requires special attention. For example, female workers in a declining textile sector may find it harder to find work in other sectors where female participation is more difficult or less accepted. Due to the different wage levels, levels of economic growth and production, we also expect some migration towards Costa Rica (and Panama) from the other Central American countries in search of better working conditions and as a result of strongly increased demand in especially the FVN sector.

Poverty levels are expected to decrease overall following the AA. In the more limited liberalisation scenario in the long run, poverty is expected to decrease by 0.6 percent (Panama included). There are however differences per country: poverty declines by 1.0 percent for El Salvador and Honduras but increases by 0.2 percent in Panama (the only

country where poverty increases). The extent to which such positive effect will materialise depend to a large extent on effectiveness of related social policy measures.

Looking at predicted wage changes, we find that unskilled wages rise faster than skilled wages, indicating a decline in income inequality, for both the comprehensive and very comprehensive scenarios. These are – however – average effects, and the effects of the AA for the domestic sectors, vulnerable groups, and women need to be looked at in more detail. No major direct effects of the AA on education or health are expected.

Environmental impacts

A small negative impact of the AA for GHG emissions in general and CO_2 emissions in particular is expected due to increases in production, trade and consumption. However, the changes are very small (+0.0 percent) compared to total global GHG emissions. The largest share comes from the EU.

Land use is expected to change significantly, especially in Costa Rica and Panama, in favour of land use for FVN. Smaller changes are expected – also towards FVN for Honduras and El Salvador. The deeper the integration, the stronger these reallocation effects are expected to be.

Loss of biodiversity and deforestation are existing large concerns in Central America, especially because a very large share of global biodiversity can be found in the region. As production changes expected in the forestry and wood products sector as a result of the AA are very small, no large direct effects on deforestation and biodiversity loss are expected from that source. However, the significant changes expected in land use allocated towards the expanding FVN sector, can pose a significant threat to forest-areas and biodiversity. This pressure on forests (and related biodiversity) can further induce illegal logging, posing an additional indirect threat not captured in the quantitative estimates. To counter these predicted negative impacts, pro-active measures are needed, both in terms of the trade and co-operation provisions of the Agreements; specific policy recommendations on how this can be done are made in the section below.

On the other hand, the AA can stimulate implementation of effective EU-Central America cooperation and policies on e.g. illegal logging and other deforestation issues, which can have positive effects in mitigating deforestation and biodiversity loss. In general, specific Sustainable Development provisions in the AA can stimulate the commitment to and implementation of international and multilateral environmental agreements (MEAs), thereby encouraging further progress on issues of international concern such as climate change, biodiversity and natural resources.

The effects on other environmental quality indicators are not clear-cut. On the one hand more trade and marine transport as well as more consumption (i.e. waste generation) could put a pressure on environmental and water quality. On the other hand, FDI flows and inclusion of Central American firms in global production networks as well as specific Sustainable Development provisions included in the AA, may enhance ‘green’ production and help bring about improvements in environmental quality.

Policy recommendations and flanking measures

In order to enhance the expected positive impacts and prevent or mitigate the potential negative ones, policy recommendations and flanking measures are suggested. These are both related to the trade part of the AA and issues outside of this. Trade-related measures can be included in the trade-related parts of the AA, while the non-trade related measures may relate to other parts of the AA or be addressed to private sector, civil society or national governments. Obviously, some recommendations are broad and can be related both within the trade-part of the AA as well as outside it.

The main recommendations relating to the economic, social and environmental pillar are summarised in the tables below. The policy recommendations in the three pillars of sustainability should be read in conjunction as they are complementary and inter-related.

*Main **economic** policy recommendations and flanking measures*

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
1. Continue promoting regional (economic) integration and regulatory convergence in Central America		√
2. Provision of technical assistance and capacity building in addressing NTMs, especially SPS, TBT and trade facilitation	√	√
3. Stimulate ongoing investment and business climate amelioration, while ensuring inclusiveness of the benefits	√	√
4. Improve infrastructure and promote port development (also outside Panama)	√	√
5. Support efforts facilitating structural adjustment across sectors in the short term resulting from implementation of the AA	√	√
6. Allow for phasing in of tariff reductions at sector level over time, especially for those sectors where social and environmental impacts will be high	√	
7. Improve the taxation system to widen and deepen its coverage		√

*Main **social** policy recommendations and flanking measures*

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
1. Include a Sustainable development chapter in the AA, including related support, addressing social and environmental issues related to the trade-part of the AA. Social issues may include: a. (Enforcement of) international labour standards b. SMEs c. Strict monitoring and evaluation systems	√	

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
d. Positive indirect effects on labour standards e. Working conditions (e.g. in the *maquilas*) also in domestically oriented sectors		
2. Promote social and tri-partite dialogue	√	√
3. Continuously involve civil society and key stakeholders in social policy issues	√	√
4. Support and provide technical assistance to the SME sector	√	√
5. Provide regional policy support, especially in regions where negative social effects are expected to be pronounced		√
6. Devote special attention to poverty and vulnerable groups		√
7. Ensure a match between educational skills and development needs		√

*Main **environmental** policy recommendation and flanking measures*

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
1. Include a Sustainable Development chapter in the AA, including related support, addressing social and environmental issues related to the trade-part of the AA. Environmental issues may include: a. Multilateral environmental agreements (MEAs) b. Regional approaches c. Impact monitoring mechanisms d. Environmental standards e. Wildlife and biodiversity f. Sector-specific issues (e.g. on forests, fishery, biofuels, organic farming, etc.)	√	
2. Create incentives for greener production, including environmental services		√
3. Enhance dissemination of innovative technologies		√
4. Create and improve monitoring mechanisms & ex-post evaluations		√
5. Continuously involve civil society and key stakeholders in environmental policy issues and conservation efforts	√	√
6. Provide regional policy support, especially in regions where negative environmental effects are expected to be pronounced		√
7. Strengthen institutional capacity for Central American environmental agencies and policy-making	√	√
8. Address deforestation and biodiversity loss	√	√

As shown in the tick-boxes in the tables, some issues can be included in the trade-related part of the AA, while others need to be addressed in the other pillars or outside the AA (or in many cases both). Dividing the policy measure above as such, we get:

Main trade-related policy recommendations and flanking measures:

- Technical assistance in addressing NTMs, especially in SPS, technical barriers to trade (TBT) and trade facilitation;
- Support efforts to facilitate structural adjustment across sectors and alleviate associated short-term difficulties and costs following the implementation of the AA, including support for reallocation of production factors among sectors, for example by means of special skills improvement programmes or providing financial incentives;
- Allow for phasing in of tariff reductions at sector level – especially for those sectors where social and environmental impacts will be high – in parallel with improvements in relevant legislation and its enforcement and the promotion of sustainability standards and their monitoring.
- Include a Sustainable Development Chapter in the AA addressing specific social issues (international labour standards, implementation and monitoring systems, agreements on working conditions and sector-specific issues) and environmental issues (MEAs, issue-specific provisions e.g. in relation to forests, fishery, biofuels, organic farming, etc., regional monitoring mechanisms and institutional capacity building of environmental agencies) – flanked by an appropriate incentive structure;
- Promote social and tri-partite dialogue in Central America, as they can help to fulfill an important social function in policy making in Central America;
- Strengthen institutional capacity for Central American environmental agencies and policy-making (at a regional and national level);
- Devote special attention, effort and funding to SMEs (being the main source of employment and livelihood in Central America) and to how they can benefit from the AA. Similarly, making the AA effects more inclusive and pro-poor requires special attention for poor and vulnerable groups, especially in regions and sectors affected disproportionately. Technical assistance in various fields and at sector-level could be aimed at specific vulnerable groups (e.g. export promotion for SMEs, entrepreneurship for female groups, environmental services in forest areas for indigenous populations and SPS standards in small-subsistence farmer areas).

Main non-trade related policy recommendations and flanking measures:

- The Central American region needs to continue deepening and broadening regional cooperation and regulatory convergence (e.g. in investment conditions, customs regulations) in order to benefit more from the AA, including strengthening domestic and regional institutions;
- Central America and EU member state governments need to further improve the business climate to facilitate doing business in the private sectors;
- Central American governments need to work on improving transport infrastructure, foster port development throughout the Isthmus, and simplify cross-border trade procedures;
- The EU can employ the globalisation fund for those regions in the EU that are negatively affected (e.g. in FVN) by the AA;

- In Central America especially (and in the EU to a lesser extent) regional government policies are required to specifically address regionally pronounced negative impacts, especially in the social field (poverty) and environmental field (deforestation).
- Promote education and skills-based learning in Central America to facilitate flexibility on the Central American labour markets;
- Deforestation and biodiversity loss and their causes (e.g. illegal logging, expansion of agricultural production and biofuels, etc.) need to be specifically addressed;
- Enhancing dissemination of innovative technologies and creating incentives for greener production, including environmental services can help induce e.g. energy-efficiency, organic farming or fewer emissions from the transport sectors.

Suggestions for further research

Having carried out the TSIA for the AA between the EU and Central America, we recommend some aspects for further research:

- Monitoring of the implementation of the AA agreement;
- Ex-post evaluation and comparison of the expected effects versus the *de facto* impact the AA has on the EU and Central American countries;
- An evaluation of the AA effects on regional integration in Central America.
- Continuing efforts to develop further quantitative environmental impact assessment methods and collect more precise data on specific regions/areas that are expected to be affected negatively e.g. by land use changes resulting from increased agricultural production.

1 Introduction and TSIA methodology

1.1 Study Aims

The Trade Sustainability Impact Assessment has two major aims:

- To analyse the **economic, social and environmental impacts** of the trade agreement resulting from the EU – Central America AA in advance of policy decision making in order to include sustainable development goals in trade policy;
- To **involve civil society in a dialogue on trade policy and trade policy issues**. This has been achieved throughout the study by actively engaging with civil society at various stages of the report development.

1.2 TSIA Methodology

In order to investigate the potential economic, social and environmental impacts of the Trade Part of the AA between the EU and Central America, the study has been divided into three phases.

Phase 0: Inception Phase

The Inception Report has been published in February 2009. This report constitutes an introduction to the TSIA process and outlines our approach to the study particularly with regard to the methodology to be applied. It also gives an preliminary short overview of some key sectoral sustainability and issues and sectoral analysis relevant to the research.

Phase 1: Interim Technical Report

The Interim Report was published in April 2009. It gives an in-depth description of the indicators studied mainly by means of quantitative analysis (CGE modelling) and gives an indication of the various economic, social and environmental impacts of the EU-Central America AA at aggregate and sectoral level.

Phase 2: Final Report

In addition to the overall results of Phase 1, Phase 2 of the study, this Final Report include in-depth analyses of some selected sectors and issues, mainly by means of qualitative analysis (causal chain analysis, expert opinions, civil society involvement) and additional quantitative analysis. Based on this, policy recommendations and flanking measures to enhance or mitigate some impacts are proposed.

1.3 Trade Sustainability Impact: indicators

When assessing expected sustainable economic, social and environmental impacts of the proposed AA, the variables and specific indicators listed in Table 1.1 are regarded.[2]

Deleted: Table 1.1

Table 1.1 Sustainability impact indicators

Area	Core Indicator	Specific Indicators
1. Economic	a) Real Income	GDP per capita, Net value added, consumer effects, effect on prices, variety of goods and services
	b) Investment	Total Investment, Public Investment, Business Investment, FDI
	c) Trade	Balance of trade in goods and services, Volume of trade in goods and services, Terms of trade
2. Social	a) Poverty	People living under poverty line, GINI index, regional effects
	b) Health	Life expectancy, Mortality rates (maternal, child), Access to health services, sanitation, nutritional levels
	c) Education	Primary, secondary and tertiary enrolment rates, literacy rates
	d) Labour issues (incl. Employment and decent work)	Unemployment, Productivity and quality of work, Rights at work, Employment opportunities, wage effects, self-employment
	e) Equality	Gender equality in employment and employment opportunities, gender equality in education, social protection, social dialogue
3. Environmental	a) Atmosphere	CO_2 emissions, air quality, quantity of dangerous chemicals in atmosphere (dangerous to ozone layer or to humans)
	b) Land	Land use in agriculture, forest, desertification, urbanization, natural resource stocks
	c) Biodiversity	Number of species, protected areas, ecosystem
	d) Environmental quality	Waste management, energy resources
	e) Fresh and waste water	Quantity of water use, Access to safe drinking water, Water quality, Quantity of waste water, Cleaning of waste water, Water supply

1.4 Consultation process

This consultation process is an important part of the qualitative approach to this study which constitutes 50 percent of the methodology applied. The other 50 percent includes quantitative modelling and analysis. The importance of an active and open consultation process with members of civil society and key stakeholders both in the EU and in Central

[2] This Table is directly copied from the Handbook of DG Trade (2006).

America has been continuously recognised throughout the study. As the Terms of Reference (ToR) indicate:

Consultation is a central part of the Trade SIA work and should start at an early stage of the process. Consultation in the EU and in the partner countries or regions under consideration is a major challenge which must be met in order for the Trade SIA process to ensure its credibility and legitimacy.

During the study, we have employed various tools in order to involve key stakeholders and civil society and ensure these actors can provide valuable input contributing to our economic, social and environmental analyses. These are outlined below.

European Union

In the EU, public meetings are held in Brussels in several stages of the project as part of DG Trade civil society dialogue. Following publication of the Inception Report, the first public meeting was held on February 2, 2009 in Brussels and several members of EU civil society including industry associations, NGOs and members of academia provided valuable comments on the report. The second public meeting will be held in Brussels on July 14, 2009 after the online publication of the draft Final Report. A summary of the discussions and an overview of the comments, feedback and opinions given by civil society and key stakeholders during these public meeting can be found online (http://www.tsia.ecorys.com/ca and (http://trade.ec.europa.eu/civilsoc/meetlist.cfm).

Central America

On April 20, 2009, a TSIA Workshop was held in Managua, Nicaragua. Representatives of Central American social and environmental organisations and the private sector attended and provided valuable input for both the interim and final phases of the study. The main goals of the TSIA workshop were to:

- provide information about the SIA methodology and the study goals;
- receive comments and feedback on the work conducted so far, particularly the sectors selected for in-depth analysis;
- look ahead to the final phase and identify the main concerns which need addressing.

During this trip to Central America, we also presented the research results at a bipartite meeting between Central American trade unionists and employer associations held by the International Labour Organisation (ILO), and had various meetings with several organisations bilaterally, including private sector representatives and NGOs, whose comments were also useful for the study.

Other Consultation Methods

A website about this TSIA study was created with DG Trade and can be viewed at www.tsia.ecorys.com/ca. This website provides:

- all project results, including the results of civil society consultations;
- an opportunity for members of civil society to give feedback and comments about our results and the study progress so far;
- general information on TSIAs (e.g. the SIA Handbook published by DG Trade).

Another important aspect of digital consultation and communication is the ECORYS TSIA Newsletter. This regular newsletter is subscribed to by a wide range of representatives from civil society and other key stakeholders. It contains information on

the study progress, upcoming (civil society) events and latest information as well as the publication of new reports. It is also published on the study website.

In addition, some organisations felt the need for further consultation opportunities outside of the workshop and public meetings in which case bilateral interviews were arranged in both Central America and the EU.

1.5 Quantitative analysis and model specifications

1.5.1 The CGE model

The CGE model used for this project is based on Francois, Van Meijl, and Van Tongeren (FMT 2005) and incorporates a number of key issues relevant to the EU-Central American trade-part of the AA[3]:

- Taxes;
- Trade policy instruments;
- International trade costs; and
- Frictional trading costs.

The CGE modelling aims to quantify the effects of the trade measures concluded in the AA negotiations and to provide the first indication of likely sustainability effects resulting from the macroeconomic level. The macro-economic indicators measured are:

- Welfare changes (income, GDP);
- Effects on high- and low-skilled wages;
- Trade effects (imports & exports);
- Net fixed capital formation;
- Resource use; and
- CO_2 emissions.

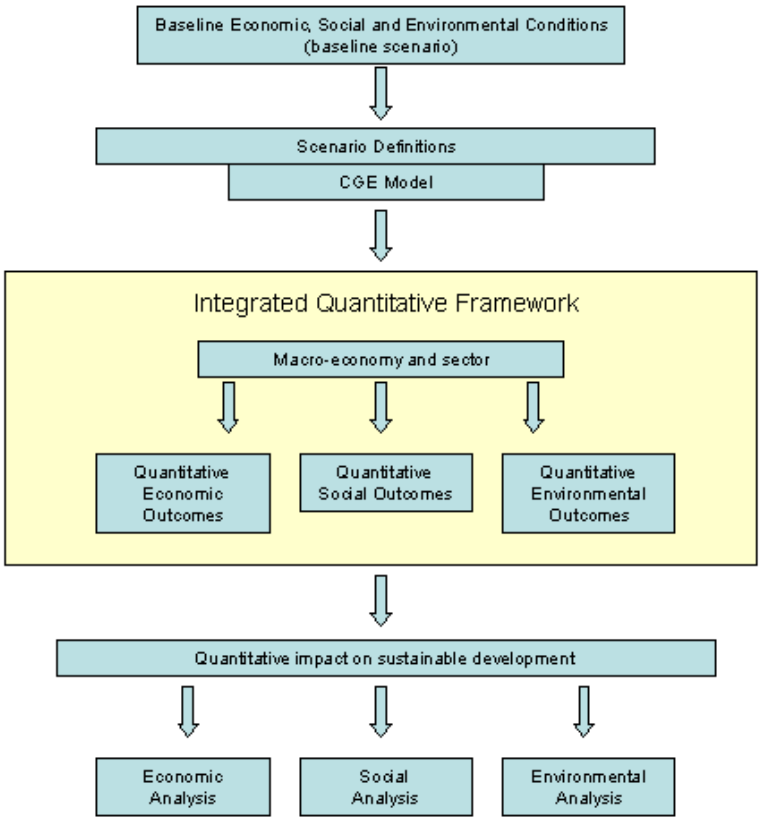
At sector level we investigate the effects of the AA on:

- Sector output changes;
- Sector employment changes;
- Price changes and;
- Sector trade flows (imports & exports).

These calculated effects serve as input for the screening exercise performed for selection of the sectors and horizontal issues for in-depth analysis, since the sustainability impacts, be it economical, social or environmental, must arise directly or indirectly from an initial economic impact.

[3] Francois. J.F., H. van Meijl and F. van Tongeren (2005), "Trade Liberalization in the Doha Development Round," Economic Policy April: 349-391.

Figure 1.1 CGE Methodology



The model description

The model used is based on the Francois, Van Meijl, and Van Tongeren model (FMT 2005). Versions have recently been employed for studies for the EC of WTO negotiations, and prospective EU-Korea, EU-India, EU-ASEAN and EU-MERCOSUR FTAs, as well as a large-scale Asian Development Bank assessment of regional integration schemes in Asia.[4] Some specifications include:

- The model is a standard multi-region computable general equilibrium (CGE) model, with important features related to the structure of competition (as described by Francois and Roland-Holst 1997).[5] Imperfect competition features are described in detail in Francois (1998);[6]
- Social accounting data are based on the most recent version 7.5 of the GTAP dataset (www.gtap.org), the best and most up-to-date source of internally consistent data on

4 Francois, J.F. and G. Wignarajan (2008), "Asian Integration: Economic Implications of Integration Scenarios," Global Economy Journal, forthcoming..

5 Francois, J.F. and D.W. Roland-Holst (1997), "Scale economies and imperfect competition, in Francois,J.F. and K.A. Reinert, eds. (1997), Applied methods for trade policy analysis: a handbook, Cambridge University Press: New York.

6 Francois, J.F. (1998), "Scale economies and imperfect competition in the GTAP model," GTAP consortium technical paper. http://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=317.

production, consumption and international trade by country and sector. For more information on the basic database structure, see Dimaran and McDougall (2006);[7]

- The GTAP data on protection incorporates the Macmaps data set, which includes a set of ad valorem equivalents (AVEs) of border protection across the world;
- The source information concerns various instruments, such as specific tariffs, mixed tariffs and quotas, which cannot be directly compared or summed. In order to be of use in a CGE model, these have been converted into an AVE per sector, per country and per trading partner;
- In order to simulate changes that happened in the world economy, the analysis employs a representation of a notional world economy in 2018, where many of the trade policy reforms that have taken place since 2004 are incorporated in the baseline;
- This means the GTAP/Macmaps tariff data are supplemented with estimates of post-Doha tariffs, based on the current Doha draft modalities, and detailed bound and applied tariff data. The post-Doha tariff estimates are discussed below.
- This also means that in the baseline all important other trade arrangements are included, like CAFTA, GSP+, and the EU-Mexican FTA.

Trade policy instruments are represented as import or export taxes/subsidies. This includes applied most-favoured nation (MFN) tariffs, antidumping duties, countervailing duties, price undertakings, export quotas, and other trade restrictions.

Services trade liberalisation is modelled as a reduction in trade costs (deadweight). The services trade costs are also implemented as costs for trading goods, allowing for the examination of the impact of trade facilitation and NTM reduction. They represent real resource costs associated with producing a good or service for sale in an export market instead of the domestic market.

International trade is modelled as a process that explicitly involves trading costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as the physical activity of transportation itself. Trade-cost margins are based on reconciled f.o.b. and c.i.f. trade data, as reported in version 7.5 of the GTAP dataset.

Baseline protection in Central America for services is based on Francois, Hoekman, and Woerz (2008) who estimate a 25 percent trade cost equivalent for commercial services trade in the region. On this basis, a 25 percent reduction in barriers implies a 6.25 percent trade cost savings (as a share of traded service prices) while a 75 percent reduction (mapping to our ambitious scenario below) implies trade cost savings equal to 18.75 percent of the cost of services delivered to the region by EU suppliers. This also implies savings on the operations of European MNEs for FDI-based operations, to the extent they rely on cross-border service transactions to support local operations in Central America.

[7] Dimaran, B, and McDougall, R., ed. (2007). The GTAP database -- version 7, Global Trade Analysis Center: Purdue University.

Sector specification

In order to use the CGE analysis, various sector divisions are applied. In the GTAP database, a total of 58 sectors are specified, but given the limited size of some, aggregations are made. The final list of 32 sectors that are analysed is shown in Table 1.2.

Table 1.2 CGE sector specifications

Sectors		
grains	wood products	other machinery and equipment
vegetables, fruit, nuts	paper products, publishing	manufactures nec
other primary food	petroleum, coal products	utilities
other agriculture	chemicals, rubber, and plastic products	construction
forestry	mineral products nec	distribution
primary fishing	ferrous metals	other transport
primary mining	metals nec	maritime transport
processed foods, beverages, tobacco	metal products	air transport
textiles	motor vehicles and parts	communications
wearing apparel	other transport equipment	financial services
leather products	electronic equipment	

Liberalisation scenarios

Given the above information and pre-analysis of the situations and trends in Central America and the EU, two different scenarios are developed:

- A comprehensive FTA;
- A very comprehensive FTA.

The assumptions made in each scenario are presented in Table 1.3 below and relate to tariff lines, services liberalisation and NTMs (trade facilitation).

Table 1.3 Trade liberalisation scenarios

	Description	Agriculture and manufacturing	Services	Trade facilitation / NTMs
Scenario 1	Comprehensive FTA Agreement	90 % bilateral tariff reductions	25 % reduction in trade costs to services trade	1% of the value of trade
Scenario 2	Very comprehensive FTA Agreement	97 % bilateral tariff reduction	75 % reduction in trade costs to services trade	3% of the value of trade

Note: On basis of bilateral service regressions, liberalisation scenarios are based on full FTA liberalisation yielding a 40% expansion on services trade. This means we model 10% trade expansion for the 25% liberalisation scenario, and 30% expansion for the 75% scenarios.

90 and 97 percent reductions in overall tariff lines are respectively applied with respect to tariffs in agriculture and manufacturing in the comprehensive and very comprehensive scenarios. For services – as explained above – first trade cost equivalents are calculated, presenting the levels of restriction in services trade in terms of a tariff number. Subsequently these tariffficated levels of restrictions are reduced by 25 percent and 75 percent in the two scenarios. Under NTMs (trade facilitation), trade costs for goods are used (using standard values). For both services and NTMs, trade costs are modelled as

real, wasted resources (i.e. a certain percentage of total costs is just to meet regulatory and related barriers).

For tariffs, barriers to trade in services and NTMs, a one-off immediate reduction is modelled – for both the EU and Central America in a symmetric way. In 2018, the short-run (i.e. static capital) and long-run (i.e. allowing for dynamic adjustment of investment flows) results are calculated.

Two more factors within each of the two scenarios are taken into consideration:

- The difference between short-run and long-run effects;
- The question whether Panama will or will not join the EU-Central American AA.

Long-run versus short-run effects

The long-run closure links capital stocks to long-run (steady-state) changes in investment in response to changes in incomes and returns to investment. [8] The long-run closure provides an assessment of the impact that policy changes under the FTA will have on capital stocks and hence induced expansion (or contraction) of the economy over a longer time horizon following FTA implementation. In the short-run it is assumed that capital stocks are fixed and are not mobile across sectors. Essentially the short-run effects can be viewed as immediate static impact of the AA while the long-run effects allow for adjustment to factor in relative shifts in comparative advantage between sectors.

Panama

At present Panama has observer status to the AA negotiations and reserves the option not to participate in the trade part of the AA. The EU, however, has made it clear that no separate EU-Panama FTA will be considered. The quantitative analysis therefore looks at the possibility of an EU-CA6 FTA (including Panama) and an EU-CA5 FTA (excluding Panama) and compares the different outcomes.

This means that for each of the two scenarios outlined above, we have four sub-scenarios, depending on these two additional factors. These are presented in Table 1.4.

Table 1.4 Trade liberalisation scenarios, including long-short run and treatment of Panama

Scenario	Treatment of short/long run and Panama
Scenario 1: Comprehensive FTA	1a: Comprehensive, short-run, including Panama 1b: Comprehensive, short-run, excluding Panama (instead in ROW) 1c: Comprehensive, long-run, including Panama 1d: Comprehensive, long-run, excluding Panama (instead in ROW)
Scenario 2: Very comprehensive FTA	2a: Very comprehensive, short-run, including Panama 2b: Very comprehensive, short-run, excluding Panama (in ROW) 2c: Very comprehensive, long-run, including Panama 2d: Very comprehensive, long-run, excluding Panama (in ROW)

[8] Long-run closure is based on: Francois, J.F., B.J. McDonald, and H. Nordstrom (1997), "Capital Accumulation in Applied Trade Models," in J.F. Francois and K.A. Reinert, eds., Applied Methods for Trade Policy Analysis: A Handbook, Cambridge University Press, 1997.

Modelling limitations

CGE modelling is the best tool to evaluate outcomes of policy changes in general equilibrium. It yields outcomes with respect to output, employment wage changes and other macroeconomic variables that are important for policy makers. However caution is needed against very rigid interpretation of the modelling outcomes due to data issues (quality and quantity of data) and modelling issues. Some of the strongest limitations that CGE modelling encounters, and that policy makers need to be aware of, include:[9]

Limitations

- Economic phenomena like involuntary unemployment, effective demand failures cannot occur because of the assumption of full employment and a fixed trade balance and fixed budget deficit;
- The comparative-static approach allows for the description of the relative changes in the economy when all the necessary adjustments have taken place. It does not provide insights into the specific timing or patterns of adjustment;
- Trade in services is included explicitly in the model for cross-border modes only (modes 1 and 2);
- Within the model it is not possible to take the informal sector into account;
- If a sector is too small, the CGE analysis may yield magnified and unrealistic results – in that case the issue will be explained and the reader will be cautioned against literal results interpretation;
- For the labour market module in the CGE model market clearing is assumed, which is in line with the request to extrapolation of the GTAP dataset to 2018 – by which time labour markets should have cleared. This enables the model to specify wage changes;
- Market imperfections are assumed to exist. For example, product differentiation in the manufacturing and services sectors is modelled, while assuming homogeneity of goods in the agricultural sector;
- Non-tariff measures (NTM) can be modelled through Ad Valorem Equivalents (AVEs) and these can be reduced to model NTM reductions. The net effect of NTMs by sector is modelled. Specific modelling of an individual NTM is not contemplated.

(Partial) solutions

- As mentioned above, the lack of a dynamic nature of many CGE models is a limitation that needs to be addressed. Therefore, even though the core CGE model is inherently comparative-static in nature, features are added to address the dynamic nature of the FTA:
- Both a short-run and long-run closure are adopted, as discussed above in the liberalisation scenario section;
- Two scenarios are modelled – one comprehensive and one very comprehensive FTA to show very long run effects versus a more short-run estimate. The more comprehensive FTA can be seen as a long-run goal to maximise welfare for the EU and Central America in a dynamic context;

[9] It is precisely for this reason that we add a gravity analysis as well as in-depth analyses in Phase 2 of the report.

- Issues of FDI, technology and introduction of new goods will be addressed in more detail at sector levels making use of gravity analysis. We employ Berden & Van Marrewijk (2007) on the introduction of new goods through reducing trade barriers;[10]

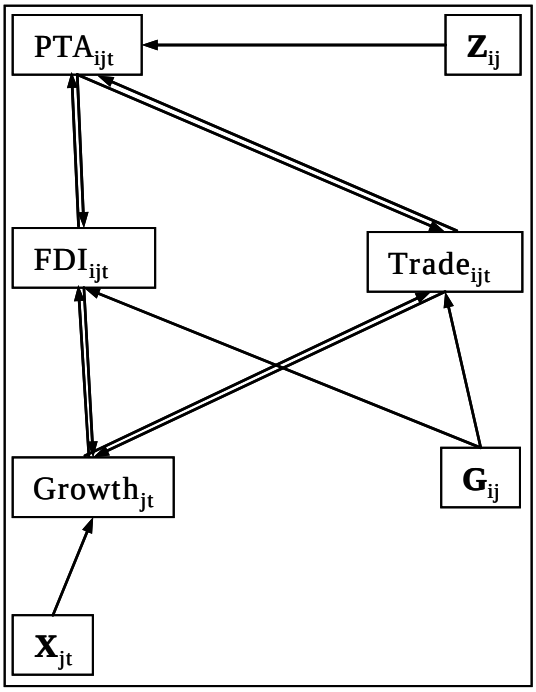
Through these measures the CGE model (and flanking methodological exercises) can be applied to adequately analyse the FTA scenarios in a meaningful way.

1.5.2 Other modelling techniques applied

FDI gravity analysis

To estimate additional effects related to FDI, we have simulated the effect of reciprocal Free-Trade Agreements (FTAs) between the EU and a number of potential partners on aggregate and sectoral growth based on elasticities estimated econometrically by Cadot & Tschopp (2009).

Figure 1.2 Growth, FDI and Trade



Growth in country *j* and year *t* is determined by a vector of country characteristics $\mathbf{X}_j$ and by trade and FDI flows with all other countries, but the relationship between growth, trade and FDI is two-way. Beyond the reverse causality from growth, bilateral FDI and

[10] Berden, K.G. and C. van Marrewijk (2007), 'On static and dynamic costs of trade restrictions', Journal of Development Economics, 2007.

trade flows are both determined by a vector of gravity variables ($\mathbf{G}_{ij}$) and by the presence of an FTA between *i* and *j*. Finally the presence of an FTA is determined, through reverse causality, by trade and FDI flows ("natural trading partners") but also by exogenous factors collected in the vector of instruments $\mathbf{Z}_{ij}$.

Modeling all these interactions would imply the simultaneous estimation of a system of equations looking roughly like this

$$\begin{aligned} FDI_{ijt} &= f_1\left(\mathbf{G}_{ijt}, g_{jt}, FTA_{ijt}\right), \quad \forall\, i \neq` j \\ T_{ijt} &= f_2\left(\mathbf{G}_{ijt}, g_{jt}, FTA_{ijt}\right) \quad \forall\, i \neq` j \\ g_{jt} &= g\left(\mathbf{X}_{jt}, \sum_{i\neq` j} FDI_{ijt}, \sum_{i\neq` j} T_{ijt}, \sum_{i\neq` j} FTA_{ijt}\right) \\ FTA_{ijt} &= h\left(FDI_{ijt}, T_{ijt}, Z_{ijt}\right). \end{aligned} \tag{1}$$

However the third of these equations is at the country level while the other three are bilateral, and the samples do not overlap (few of our countries of interest are in the OECD's bilateral FDI database, which is the one we use for the gravity estimation). Thus, direct estimation of system (1) is not feasible. As a second best, we go for a multi-step approach based on stand-alone reduced-form equations in which all potentially endogenous variables are instrumented, either through the use of outside instruments or through their own lagged values and first differences, using the GMM estimator. We also limit the estimation to the relationship between FTAs, FDI and growth, without considering the effect of FTAs on trade. In a first step, we estimate the effect of E.U. preferences on bilateral flows using a gravity equation (in which income levels are instrumented). In a second step, we estimate the effect of aggregate (all sources confounded) FDI inflows on growth in a panel growth equation (where FDI inflows are instrumented). In a third step, we allocate the growth boost across 28 SIC manufacturing sectors according to long-run elasticities of sectoral value added to aggregate growth estimated on time series.

Using this approach (which is based on Cadot-Tschopp, 2009), we are able to quantify the additional effects on sector output growth that a FTA with the EU will have for a range of countries (including in Central America) through resulting increases in FDI.[11] The resulting estimates under this approach for Central America provide a measure of increased output at the sector level because of FDI that follows from an FTA with the EU.

Global Simulation (GSIM) bananas / sugar

In addition to the general equilibrium modeling, a partial equilibrium model (GSIM) is applied in order to assess potential specific effects in some important product groups inside the agricultural sector – bananas and sugar.

The GSIM model was developed by Francois and Hall (2003)[12] and is a log-linearised partial equilibrium model developed for trade policy analysis at industry level. National

[11] Cadot , O and T. Schopp (2009), "*E.U preferences, FDI and Growth,"* manuscript.

[12] Francois and Hall (2003), Global Simulation Analysis of Industry-level Trade Policy, http://www.intereconomics.com/handbook/Models/Spreadsheet%20Models/GSIMpaper.pdf

product differentiation is a basic assumption of the model, meaning that imports are assumed to be imperfect substitutes for each other. The model uses a CES (Armington) import demand function. Import supply is similarly characterized by constant (supply) elasticities. The model requires data for trade and trade protection measures (also domestic production support could be included, but these have not been used this time). The results provide the changes in national output, consumer surplus, producer surplus, tariff revenues and in total net welfare. A more detailed description of the model is provided in Francois and Hall (2003).

The specification of the model as applied here are as follows. The model was run with a base year of 2007. Two scenarios were made, similar to the CGE model used:

1. Comprehensive scenario, assuming a 90 percent cut in tariffs; and
2. Very comprehensive scenario, assuming a 97 percent cut in tariffs.

UN Comtrade data from 2007 were used for the analysis together with WITS data of tariff levels. The baseline tariff levels assume the finalisation of Doha negotiations. The analysis is done for the following countries/regions: Costa Rica, Panama, El Salvador, Honduras, Guatemala, Nicaragua, EU27 and Rest of World (ROW). In addition, the bananas analysis includes results for the grouping of Rest of Middle and Low Income Countries (RMLIC), trying to capture the likely effect of a trade agreement between the EU and Central America on some of the other major banana exporting countries (such as Ecuador and Columbia). Similarly, the sugar analysis includes effects for the least developed countries (LDCs), which have currently a preferential access to the EU market and could potentially face large impacts from increased market access of Central American countries to the European sugar market.

Poverty analysis

In order to complement the overall impacts of the AA, the potential effects on poverty in the Central American region are quantified more directly with a specific poverty analysis. There is a large body of CGE literature on the impact of trade reforms on income distribution and there are studies that give theoretical explanation of linkage between trade and poverty mainly focusing on income distribution. However, very few attempts have been made to investigate the impact of trade liberalisation on poverty within the general equilibrium framework. Hence, the effects on poverty could not be calculated with the CGE model, but the results of the CGE analysis are used for the analysis.

Change in poverty is looked at as the interplay between changes in income distribution and changes in consumer prices. The CGE model provides estimates of the change in average income and consumer prices. Assuming that variance of income distribution does not change under the scenarios, changes in average income and changes in the poverty line would result in the change in poverty ratios for each region. Gini coefficients are available for all the Central American countries. Since Gini coefficients are invariant under changes of scale, they should be independent of the mean and only depend on standard deviation. Hence, lognormal standard deviation can be easily derived from the Gini coefficient and the log-mean can be estimated given the benchmark average income and lognormal standard deviation. Our objective is to look at the change in the baseline (benchmark) poverty due to the shocks estimated in the different scenarios. Similar to the Gini coefficients, as poverty ratios and average income for each country are based on

many sources, even for different time periods, we need to calibrate some of the parameters in order to maintain the benchmark poverty ratio. Given the benchmark poverty ratio and derived lognormal parameters explained above, we could calibrate the lognormal poverty line using the standard normal density function of FGT poverty measures. Table 1.5 provides the results of the estimated lognormal standards deviation, log normal mean and calibrated lognormal poverty line. Further, in order to calculate the change in poverty for the overall Central American region, we have derived benchmark poverty ratio for overall Central America by using the individual country's population for the latest year available. This is reported in the column *Absolute poverty share* and, in other words, it reports the share of poor people from all Central American countries located in each country. The poverty shares estimated thereof have been used later in the scenario analysis to derive change in poverty for overall Central American region.

Table 1.5 Benchmark poverty ratio, poverty line and lognormal parameters

	Poverty ratio (%)	Absolute poverty share (%)	Lognormal standard deviation	Lognormal mean	Calibrated lognormal poverty line
Costa Rica	18.60	3.65	0.910	8.202	7.390
Guatemala	54.80	34.77	1.153	7.139	7.278
Panama	29.00	4.68	1.008	8.104	7.547
Nicaragua	61.90	16.87	1.026	6.371	6.682
El Salvador & Honduras	58.21	40.03	1.022	7.183	7.395
All Central America	**51.23**	**100**			

Poverty ratios: CEPAL, Other variables: Authors estimations.

Poverty measurement can be categorized by the degree to which it includes aspects of well-being among the poor. Income poverty, typically measured against a poverty line, indirectly reflects access to goods and services that again affect well-being. The most frequently used poverty index is the head count index or poverty ratio, i.e. share of population living below the poverty line. For our study we focus on the income poverty that can be analysed via the CGE results. There are two major sources of data on poverty for Central American countries: the World Bank (in World development Indicators[13]) and United Nations' CEPAL. Both of them set two poverty lines: the moderate poverty (simple poverty line) and the extreme poverty (indigence). The World Bank poverty line is set at a fixed per day income, e.g. $ 2.15 for moderate and $ 1.08 for extreme in 2004. On the contrary CEPAL has developed country-specific poverty line based on basket of consumption goods consumed by the poor based on household surveys. The poverty ratios reported above are based on the CEPAL poverty lines.

[13] World Bank (2007), World Development Indicators Online, World Bank, Washington DC.

2 Overview of Quantitative Impacts

2.1 Introduction

This Chapter gives an overview of the main quantitative findings of this TSIA. The CGE outcomes are summarised, at macro-economic level as well as at sector level. The detailed model outcomes of the CGE can be found in the Annexes to this report. In addition to the CGE results, the outcomes of the additional analysis performed on FDI as well as on poverty are presented here.

2.2 Overall macro-economic results (CGE)

The overall macro-economic results are presented in Table 2.1 below for each of the Central American countries, EU-27, LDC and Rest of World, for each of the scenarios 1a-d and 2a-d. These results entail percentage change in national income, change in national income (€ millions), percentage changes in unskilled and skilled labour, percentage changes in total exports and percentage changes in total imports.

Table 2.1 Summary of macroeconomic changes

Scenario / variable	CRI	NIC	GTM	ES	HON	PAN	EU-27	LDC	ROW
Scenario 1a: Comprehensive FTA (short run. including Panama)									
National income (% change)	1.3	0.5	0.1	0.4	0.6	1.5	0.0	0.0	0.0
National income (€ million)	333.2	45.9	54.2	133.3	112.1	436.6	625.7	28.9	-93.8
Unskilled wages (% change)	0.6	0.8	0.2			0.0	0.0	0.0	0.0
Skilled wages (% change)	0.2	0.6	-0.1			-0.4	0.0	0.0	0.0
Total exports (% change)	6.7	2.3	2.8	2.4	4.7	11.3	0.0	0.0	0.0
Total imports (% change)	8.0	1.2	1.6			8.0	0.0	0.0	0.0
Scenario 1b: Comprehensive FTA (short run. excluding Panama)									
National income (% change)	1.3	0.5	0.1	0.4	0.6	0.0	0.0	0.0	0.0
National income (€ million)	335.6	47.5	58.8	134.3	112.9	-6.2	621.8	11.2	-243.9
Unskilled wages (% change)	0.6	0.8	0.2			0.0	0.0	0.0	0.0
Skilled wages (% change)	0.2	0.7	-0.1			0.0	0.0	0.0	0.0
Total exports (% change)	6.8	2.5	3.0	2.5	4.9	-0.1	0.0	0.0	0.0
Total imports (% change)	8.2	1.3	1.6			-0.1	0.0	0.0	0.0
Scenario 1c: Comprehensive FTA (long run. including Panama)									
National income (% change)	1.7	0.2	0.3	0.9	1.3	0.8	0.0	0.0	0.0
National income (€ million)	436.2	21.1	199.0	303.1	254.8	248.4	1749.8	82.1	-304.8
Unskilled wages (% change)	1.0	0.5	0.4			-0.6	0.0	0.0	0.0

Scenario / variable	CRI	NIC	GTM	ES	HON	PAN	EU-27	LDC	ROW
Skilled wages (% change)	0.7	0.3	0.1			-0.9	0.0	0.0	0.0
Total exports (% change)	7.6	2.2	2.9	2.8	5.5	10.9	0.0	0.0	0.0
Total imports (% change)	8.7	1.2	1.7			8.2	0.0	0.0	0.0
Scenario 1d: Comprehensive FTA (long run. excluding Panama)									
National income (% change)	1.7	0.2	0.3	0.9	1.3	0.0	0.0	0.0	0.0
National income (€ million)	440.7	24.0	180.7	303.9	255.5	-5.2	1524.3	35.8	-538.6
Unskilled wages (% change)	1.0	0.6	0.4			0.0	0.0	0.0	0.0
Skilled wages (% change)	0.7	0.4	0.1			0.0	0.0	0.0	0.0
Total exports (% change)	7.7	2.4	3.1	2.9	5.7	-0.1	0.0	0.0	0.0
Total imports (% change)	8.9	1.3	1.7			-0.1	0.0	0.0	0.0
Scenario 2a: Very comprehensive FTA (short run. including Panama)									
National income (% change)	1.6	0.8	0.2	0.7	1.0	1.9	0.0	0.0	0.0
National income (€ million)	413.7	78.1	119.5	231.1	194.3	574.0	737.7	32.5	-79.2
Unskilled wages (% change)	0.9	1.3	0.3			0.2	0.0	0.0	0.0
Skilled wages (% change)	0.4	1.0	-0.2			-0.2	0.0	0.0	0.0
Total exports (% change)	13.1	3.5	4.4	3.5	6.9	14.6	0.0	0.0	0.0
Total imports (% change)	17.0	1.9	2.5			10.7	0.1	0.0	0.0
Scenario 2b: Very comprehensive FTA (short run. excluding Panama)									
National income (% change)	1.6	0.8	0.2	0.7	1.0	0.0	0.0	0.0	0.0
National income (€ million)	416.9	79.9	124.6	232.2	195.3	-7.3	736.9	12.2	-252.1
Unskilled wages (% change)	0.9	1.3	0.3			0.0	0.0	0.0	0.0
Skilled wages (% change)	0.4	1.1	-0.2			0.0	0.0	0.0	0.0
Total exports (% change)	13.3	3.7	4.6	3.6	7.0	-0.2	0.0	0.0	0.0
Total imports (% change)	17.2	2.0	2.6			-0.1	0.0	0.0	0.0
Scenario 2c: Very comprehensive FTA (long run. including Panama)									
National income (% change)	3.5	0.5	0.6	1.6	2.2	1.3	0.0	0.0	0.0
National income (€ million)	919.4	44.3	368.3	502.2	422.3	380.8	2,286.4	82.0	-411.6
Unskilled wages (% change)	3.2	0.9	0.7			-0.5	0.0	0.0	0.0
Skilled wages (% change)	2.8	0.6	0.2			-0.8	0.0	0.0	0.0
Total exports (% change)	17.7	3.4	4.6	4.2	8.2	14.2	0.1	0.0	0.0
Total imports (% change)	20.9	2.0	2.8			10.9	0.1	0.0	0.0
Scenario 2d: Very comprehensive FTA (long run. excluding Panama)									
National income (% change)	3.5	0.5	0.6	1.6	2.2	0.0	0.0	0.0	0.0
National income (€ million)	925.3	47.6	347.9	503.1	423.1	-5.9	2,018.9	29.4	-671.4
Unskilled wages (% change)	3.2	0.9	0.7			0.0	0.0	0.0	0.0
Skilled wages (% change)	2.8	0.6	0.2			0.0	0.0	0.0	0.0
Total exports (% change)	17.8	3.6	4.8	4.3	8.4	-0.1	0.1	0.0	0.0
Total imports (% change)	21.1	2.1	2.8			-0.1	0.1	0.0	0.0

* CRI = Costa Rica, NIC = Nicaragua, GTM = Guatemala, ES = El Salvador, PAN = Panama, HON = Honduras, LDC = Least Developed Countries, ROW = Rest of World

2.2.1 Absolute and percentage change in national income

Table 2.1 presents changes in national income, as a percentage change from the baseline (2018) incomes. These give an overall measure of the relative impact by AA partner. Several patterns stand out:

1. Consistently, the impact on the EU is positive but negligible (+0.0 percent). This is because of the small size of the Central American economies relative to the EU.
2. Participation of Panama in the proposed AA is important for Panama, but not for the other parties. Panama will benefit if it does take part, but the benefits for other parties are not dependent on participation by Panama. Moreover, analysis of the subsequent macro-economic variables for Panama show three effects: a. Income effects drive a service sector expansion in a light Dutch disease[14] manner whereby overall GDP grows, overall exports increase (due to the expansion of the dominating sector(s)) at the expense of most other sectors (substitution), terms of trade are expected to improve, but due to negative dynamic investment effects (investments in Panama will decrease), long-run wages are going down, and negative labour displacement occurs; b. Also commercial service export increases drive the service sector expansion; c. Reinforced by EU manufacturing that can displace Panamanian production.
3. Overall, the largest gains follow, over the long-run, with the very comprehensive scenario.

Turning to a second perspective on overall macroeconomic effects, we look at gains from the proposed FTA measured in € millions valued in 2008 prices. The EU gains are estimated to be around €2.0 billion. Though in absolute terms this is a considerable effect (similar to the gains for the total Central American region), this is small as a share of total EU GDP (see analysis on percentage change effects above). At country level, substantial gains are realized in Costa Rica (between €330 million and €925 million) and El Salvador (between €133 million and €503 million), as well as Honduras (as much as €423 million). However, also Nicaragua and Guatemala gain, albeit to a smaller absolute extent. There is a small but positive impact on low income developing countries, and a small negative impact (less than 0.01 percent of GDP, or -€671 million) on the rest of the world.

2.2.2 Wage effects for low- and high-skilled workers

With respect to overall labour market impacts, we focus on two sets of impact indicators. The first is changes in labour income as presented in the Table above. The second is the relative reallocation of labour between sectors, measured by the standard deviation of percent changes in employment across sectors as presented in the Tables below.

Changes in labour income

As with income effects, we find no impact on labour market incomes in the European Union. There are, however, substantial positive impacts for the CA5. These range from

[14] Dutch disease relates to the negative consequences on the functioning of the rest of the economy, as a result of large increases to a country's income from one source, causing an increase in its currency value (as a result of large increase in foreign currency from FDI, foreign aid or a substantial increase in natural resource prices). The name stems from the exploitation of large natural gas reserves in the Netherlands, resulting in this economic phenomenon that caused a decrease in competitiveness and thus exports of manufactured goods and an increase in imports. In other words, non-resource industries are hurt by increase of wealth generated by resource-based industries.

0.2 percent (Guatemala, comprehensive agreement in the short-run) to 3.2 percent of unskilled labour wages (Costa Rica, long-run, very comprehensive scenario). Skilled wage effects are more muted, ranging up to 2.8 percent (Costa Rica, long-run, very comprehensive scenario). The one exception is Panama. While positive income gains are realised if Panama takes part, the dynamic investment effects actually drive down wages in Panama. As a result, we see a decline in wages in Panama (0.5 percent) consistently in the long-run, with Panama's participation in the AA. Note that third country effects are generally negligible (at or near zero).

Table 2.2 Labour displacement, standard deviation of sector changes in employment*

	Comprehensive FTA Short Run				Comprehensive FTA Long Run			
	All countries		No Panama		All countries		No Panama	
	UL	SL	UL	SL	UL	SL	UL	SL
EU27	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Costa Rica	6.2	6.2	6.3	6.3	6.3	6.3	6.3	6.3
Guatemala	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2
Nicaragua	3.6	3.6	3.5	3.5	3.5	3.5	3.4	3.4
Panama	15.0	15.0	0.3	0.3	15.2	15.2	0.3	0.3
Rest of CA (ES, Hon)	4.4	4.4	4.4	4.4	4.9	4.9	4.9	4.9
ROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	Very Comprehensive FTA Short Run				Very Comprehensive FTA Long Run			
	All countries		No Panama		All countries		No Panama	
	UL	SL	UL	SL	UL	SL	UL	SL
EU27	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2
Costa Rica	10.6	10.7	10.7	10.7	11.2	11.2	11.3	11.3
Guatemala	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.8
Nicaragua	5.2	5.2	5.1	5.1	5.1	5.1	5.1	5.1
Panama	17.1	17.1	0.3	0.3	17.4	17.4	0.4	0.4
Rest of CA (ES, Hon)	7.2	7.2	7.2	7.2	8.2	8.2	8.2	8.2
ROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* UL = Unskilled Labour; SK = Skilled Labour

Relative reallocation of labour between sectors

A second set of measures of labour market impacts relates to labour displacement. This involves quantifying possible percent deviations in employment across sectors. The Tables above report these effects in standard deviation form. This provides a measure of relative movement of labour across sectors under the various scenarios. There is a slight shift in EU employment, but the standard deviation of change is less than 0.3 percent of sector employment. In contrast, the impact of an FTA on Central American countries is consistently an order of magnitude (or more) above the EU impacts. Indeed, the greatest impact is in Panama (a standard deviation of change equal to 15 percent of sector employment). Combined with the negative long-run wage effects, this implies that labour market impacts in Panama are likely to be substantial and negative.

In contrast, for the CA5 countries, positive wage effects mean that labour market displacement is "good." Workers move between sectors because they are drawn by higher

wages in expanding export sectors. Hence, for example, in Costa Rica we see substantial labour displacement (over 6 percent of the work force and as much as 11 percent of unskilled and skilled labour), yet this is in the context of rising wages (up to a 3.2 percent increase). This means that while there will be a substantial impact on Central American labour markets, these are positive mechanisms at play, with workers relocating in response to rising wages and increased labour market demand. The one consistent negative outlier to this pattern of effects is Panama.

2.2.3 Percentage change in value of exports

The overall export effects help to explain the relative income effects. The greatest trade effects are for Costa Rica, which corresponds to the income gains reported above. Similarly, the relative trade gains for Honduras and El Salvador help explain their relative income gains as well. Clearly, duty free access to the EU marker translates, at a macroeconomic level, into increased trade opportunities and, in turn, increased national income. The impact on Panama also helps to explain the national income effects: when Panama is outside the proposed AA, it realizes a slight drop in export competitiveness. This is compensated when Panama takes part in the agreement. At the same time, for other AA members, because there is little trade impact in the CA5 and CA6 scenarios, this offers a clear explanation of why there is also limited impact above in estimated income levels. Another clear message is that, like the income effects, there is some substantial variation in trade impacts, with the very comprehensive agreement driving larger trade gains, and hence larger income gains.

2.2.4 Terms of trade effects

Below, in Table 2.3, we present the terms of trade effects. The terms of trade effects show how many imports a country's export can buy (in value terms).

Table 2.3 Terms of trade effects

	Comprehensive FTA Short Run		Comprehensive FTA Long Run		Very Comprehensive FTA Short Run		Very Comprehensive FTA Long Run	
	All countries	without Panama	All countries	without Panama	All countries	without Panama	All countries	without Panama
European Union	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Costa Rica	2.4	2.4	2.3	2.3	3.0	3.0	2.4	2.4
Guatemala	-0.5	-0.4	-0.5	-0.4	-0.6	-0.5	-0.6	-0.5
Nicaragua	-0.3	-0.3	-0.2	-0.2	-0.4	-0.4	-0.3	-0.3
Panama	7.7		7.9		9.3		9.4	
Honduras, El Salvador	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2
LDC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

The Table illustrates that the EU terms of trade are not affected, but that there are significant terms of trade changes in the Central American economies. Costa Rica and

Panama see significant improvements in their terms of trade, while the other economies in the region see small deteriorations, reflecting a small relative deterioration in export prices versus prices for import goods and/or a shift towards sectors with lower export prices or imports at higher export prices.

2.2.5 CO_2 effects

Looking at the effects of the different FTA scenarios on CO_2 emissions[15], we find that the largest share of CO_2 emission annual change as a consequence of the free trade agreement stems from the EU (63 percent of the total additional annual CO_2 emissions). We also note that in the very comprehensive scenario emissions are 20 to 30 percent higher than in the comprehensive scenarios (e.g. 966,000 metric tonnes in the very comprehensive scenario versus 742,000 metric tonnes in the comprehensive scenario). The real increase in CO_2 emissions, however, comes from the long-run scenarios versus the short-run ones, with a 155 percent increase in the very comprehensive scenario. In Central America, most CO_2 emissions come from El Salvador, Honduras and Costa Rica.

Table 2.4 Change in annual CO_2 emissions (thousands of metric tonnes)*

	Comprehensive FTA Short Run		Comprehensive FTA Long Run		Very Comprehensive FTA Short Run		Very Comprehensive FTA Long Run	
	All countries	without Panama	All countries	without Panama	All countries	without Panama	All countries	without Panama
European Union	313.7	199.2	741.9	547.7	378.4	244.0	966.0	731.9
Costa Rica	-0.5	-0.8	34.0	34.5	2.4	2.0	171.2	171.8
Guatemala	27.5	26.7	61.5	55.4	46.7	45.9	105.2	98.3
Nicaragua	26.5	26.8	13.2	14.2	43.2	43.5	24.7	25.8
Panama	4.1		-39.4		12.9		-31.9	
Honduras. El Salvador	75.6	75.3	171.3	170.9	125.6	125.2	278.4	277.9
ROW	-44.4	-66.7	-177.8	-133.3	0.0	-44.4	22.2	66.7
Total	**402.3**	**260.5**	**804.7**	**689.4**	**609.1**	**416.2**	**1,535.7**	**1,372.5**
% Global Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

* LDC effects are so small, they are included in Rest of World (ROW).

2.2.6 Natural resource use

Change in natural annual resource use is an indicator – based on the CGE results – that provides information as to the potential environmental impacts of the trade part of the AA (under the different scenarios). From Table 2.5 and Table 2.6 we understand that land use for grains and livestock in especially Costa Rica and Panama is expected to decline in favour of land use for vegetables and fruits. The same effect, though much smaller, is

[15] CO2 emission levels estimated in the model follow from activity by sector. As the sectors are projected to expand or retract, there is a direct link with the increase or decline in CO2 emission levels as compared to the baseline levels.

foreseen for Honduras and El Salvador. In the EU the reverse effect is expected, small in percentage change, though significant in absolute terms. Fish production will decline especially in Costa Rica (-0.5 percent) and Panama (-0.7 percent).

The very comprehensive scenario shows similar though more pronounced effects compared to the comprehensive scenario; i.e. the reallocation to land use for vegetables and fruits is more pronounced – in line with output and employment changes as well as export figures that are expected results of the FTA.

Table 2.5 Percentage change in annual resource use (long run, comprehensive scenario)

	Land for grains	Land for vegetables, fruit	Land for livestock	Fish production
European Union	0.4	-0.9	0.3	0.0
Costa Rica	-12.8	13.9	-12.0	-0.5
Guatemala	-0.3	0.2	0.1	0.1
Nicaragua	-1.2	2.0	-0.2	0.2
Panama	-14.3	40.4	-15.0	-0.7
Honduras, El Salvador	-1.7	3.8	-0.7	0.2
Low income developing countries	0.0	0.0	0.0	0.0
ROW	0.0	0.0	0.0	0.0

Table 2.6 Percentage change in annual resource use (long run, very comprehensive scenario)

	Land for grains	Land for vegetables, fruit	Land for livestock	Fish production
European Union	0.4	-1.0	0.3	0.0
Costa Rica	-14.8	15.8	-14.0	-0.7
Guatemala	-0.5	0.2	0.2	0.2
Nicaragua	-1.7	2.3	-0.3	0.4
Panama	-16.1	44.3	-16.9	-0.8
Honduras, El Salvador	-2.2	4.1	-0.6	0.4
Low income developing countries	0.0	0.0	0.0	0.0
ROW	0.0	0.0	0.0	0.0

2.3 Sector specific modelling results (CGE)

This section provides an overall summary of the modelling results at sector level. The detailed sector effects are reported in the Annexes to this report. The Annex also contains the in-depth sectoral analyses performed.

2.3.1 Output effects at sector level

First, in Central America, the greatest positive sector output impacts on average are on **vegetables, fruits & nuts** (+10 percent on average overall) although the effect is most positive for Panama and Costa Rica. The effect is strongest in the long-term very comprehensive scenario. **Electronic equipment** is also a sector that is projected to grow on average for Central America, but this applies to El Salvador, Honduras and Costa Rica. In fact, Panama and Nicaragua will see output reductions in this sector, as comparative advantages are reinforced by the trade part of the AA. In the case of **processed foods** (including for example processed fish products), **beverages and tobacco,** internal specialisation within the Central American region is also expected. Whereas production and exports are expected to decline in Costa Rica and Panama (if Panama joins the AA), the sector is expected to see growth in Guatemala, Nicaragua, Honduras and El Salvador. For **public services & dwellings** all Central American countries are expected to gain to a limited extent, although privitisation of certain public services, such as drinking water, may mean some vulnerable groups have reduced access.[16]

The sector that is expected to decline across the board of Central American countries is **transport equipment**; from -25 percent for Panama to -1.8 percent for Nicaragua outputs are reduced. This negative output effect is also expected for **other manufactures** (with the exception of Costa Rica where there are no effects) and **insurance services**.

For the EU a very small decrease in output in the **vegetables, fruits & nuts** sector and **electronic equipment** sectors is expected. The EU stands to gain a little bit in **grains**, **other agriculture** and **other primary foods**. Given the small changes and the fact the FTA is calculated as a divergence from the baseline, the EU effects can be considered negligible.

2.3.2 Price effects at sector level

Price effects at sector level are important to report for the subsequent poverty and social impact analysis because they give information about the cost of living and can be combined with wage effects to see what happens with incomes in Central America and the EU.

For the EU very small price effects occur, mainly due to decreasing land prices. Subsequently, the prices for **grains**, **vegetables, fruits & nuts**, **other agriculture, processed foods, beverages & tobacco** and **other processed foods** are predicted to decrease a little.

For the Central American economies, the picture is mixed. Whereas for Costa Rica and Panama prices for **agricultural products** are predicted to increase significantly (mainly as a consequence of increases in the prices for land in those countries), for Nicaragua and

[16] CDC (2008), *La privitización de los servicios de agua potable en Centroamérica: avances y perspectivas frente a los acuerdos de libre comercio).*

Guatemala that is much less the case. For Guatemala, Nicaragua, El Salvador and Honduras most sectors show decreasing prices (e.g. **chemicals, insurance**) as a consequence of the long-term very comprehensive FTA. The only exception in Guatemala and Nicaragua is an expected rise in prices for **motor vehicles & parts**. With the exception of Costa Rica, we predict a drop in prices in the **financial services** and **insurance services** sectors. These sectors in Central America are expected to shed jobs under pressure from imports from Europe. Tracing through the trade, output, and employment effects, we see imports rising between 12 and 42 percent across the various scenarios for the different countries.

2.3.3 Employment effects at sector level

Focusing on employment, there are some negative impacts for Central America that matter in all scenario specifications. Employment in the **motor vehicles & parts** sector and the **transport equipment** sector drops in a range of 0.5 to 22.3 percent. This is sustained both in the short-run and the long-run as dynamic effects pull employment towards sectors where higher wages draw in workers, like **vegetables, fruits & nuts** in Costa Rica and Panama and **electronic equipment** for Costa Rica, Guatemala, El Salvador and Honduras. For Nicaragua, Guatemala, El Salvador and Honduras a similar effect is expected to occur with a pull from the **textiles** sector. Overall, like with output changes, Costa Rica and Panama see employment gains in electronic equipment and vegetables, fruits & nuts, Nicaragua and Guatemala see employment gains in textiles, machinery and chemicals, rubber & plastics, and El Salvador and Honduras – 'in the middle' – see gains in **electronic equipment**, **vegetables, fruits & nuts** and **textiles**.

For the EU, the employment effects, both in the long-run and short-run, and for both scenarios, are negligible, with the very small exceptions of a decrease in employment in the **vegetables, fruits & nuts** and **electronic equipment** sectors.

2.3.4 Trade effects at sector level (imports and exports)

Overall trade flows, both imports and exports increase substantially as a consequence of the AA, causing positive effects for national income; especially the sector **vegetables, fruits & nuts** benefits from the AA. Imports into Central American countries increase significantly, but exports increase much more. This is in line with predicted output and employment effects in the previous sections.

The trade pattern changes (imports & exports) also show a relative shift of comparative advantage of **textiles & clothing** to Guatemala and Nicaragua (**leather**), away from Panama and Costa Rica. For **electronics**, we observe a shift of exports from Nicaragua and Panama to Costa Rica and Guatemala. Nicaragua sees increases in exports in **chemicals** and **other machinery equipment**.

For the sectors **transport equipment**, a slight increase in exports is seen in the EU, while exports from especially Panama decrease. A very slight decrease in **electronics** is seen in the EU, while especially Costa Rica is expected to increase its exports (as well as imports,

though relatively less). In the sector **processed foods, beverages and tobacco**, the increase of imports outpaces the changes in exports in Panama, Costa Rica and to a lesser extent Guatemala. Other sectors that see a large increase in imports include **other business services, construction, financial services, chemicals, rubbers & plastics** and **insurance services.**

Generally for most **services sectors** in Central America, both imports and exports expected to increase (though mixed results are observed for Nicaragua), implying increased intra-sectoral trade in services. Increased imports of cheaper enabling services from the EU – financial and insurance services – may have a negative impact on employment and output in the sectors themselves, but a positive effect on other sectors through lower prices for financial and insurance services.

2.4 Additional quantitative analysis results

2.4.1 Foreign Direct Investment

In addition to the CGE economic modelling results, a further indirect effect on growth as a result of induced changes in investment (FDI) can be expected. The estimates of our FDI analysis provide a measure at sector level of increased output because of FDI that follows from an AA with the EU. The results for Costa Rica, Guatemala, Nicaragua and Panama are summarized in the Annexes to this report. For each ISIC sector, the tables report the measured growth rate for the last available year, and the simulated growth rate at sector level obtained by adding the growth differential obtained by multiplying the GDP growth differential (with AA vs. without) by the relevant parameter estimate.

For the Central American states, estimated effects vary by country. In Panama, Nicaragua, and Guatemala, we have identified a number of sectors where effects are at or above 1 percent of value added. For Panama, these are **iron and steel, petroleum and coal products, and glassware, and non-metallic mineral products**. For Nicaragua, **non-electrical machinery and iron and steel** are the sectors seeing most growth. For Guatemala, the **plastics and pottery sectors**, (and also **metals** at close to 1 percent), are most affected (around 1 percent). In contrast, in Costa Rica all effects are less than 1 percent, with the greatest (but still less than 1 percent) in furniture and petroleum.

Our results must be taken very cautiously for a number of obvious reasons: (i) our approach is based on reduced-form estimation; (ii) it yields average elasticities estimated on a heterogeneous sample; (iii) it is relatively aggregate and so will understate the sectoral drivers of FDI. This said, we find that FTAs between the EU and non-EU members in general tend to trigger, on average, substantial inflows of FDI – and the EU-Central America AA is no exception to that. Those seem to translate into growth effects, with increases in value added ranging around roughly 0.5 percent.

2.4.2 Poverty

Intensification of globalization has created a need to analyse further regional losers and winners of the trade liberalisation. Hence, in addition to the impact analysis done through CGE, the study is substantiated with an analysis of the effect of the potential AA on poverty in the Central American republics – which relates to income distributional effects.

Since the beginning of the 21st century, most of the Central American countries have faced solid growth figures thanks to significant reform processes. Still, the region faces severe competition in the global market due to lifting of quotas. Though poverty ratios have fallen in the region, more than 50 percent of the population in some countries, such as Guatemala, Nicaragua, and Honduras, continue to live in poverty. The reported higher Gini coefficients of the Central American countries are an indication of high-income disparity in this region. Costa Rica has the lowest share of poverty with 18.6 percent of population living below the poverty line, while the worst situation is in Honduras with 68.9 percent of population living in poverty in 2007. See Table 2.7 for detailed information on the poverty ratios and Gini coefficient values.

Table 2.7 Poverty Ration and Gini coefficients for Central American Countries

	Poverty Ratios						Gini Coefficients					
Year	Costa Rica	Guatemala	Nicaragua	Panama	El Salvador	Honduras	Costa Rica	Guatemala	Nicaragua	Panama	El Salvador	Honduras
1998		61.1	69.9					0.56	0.584			
1999	20.3				49.8	79.7	0.473			0.536	0.518	0.564
2001			69.3		48.9				0.579		0.525	
2002	20.3	60.2		34		77.3	0.488	0.543		0.561		0.588
2003						74.8						0.587
2004	20.5			31.8	47.5		0.478			0.548	0.493	
2005	21.1		61.9	33			0.47		0.532	0.545		
2006	19	54.8		29.9		71.5	0.478	0.585		0.54		0.605
2007	18.6			29		68.9	0.484			0.524		0.58

Source: CEPAL

Since consumer prices are endogenously determined in the model, the monetary value of the poverty line is also endogenously determined. Each FTA experiment (shock) of the CGE model yields a set of new consumer prices and average incomes, which are then used to calculate the change in the poverty line and mean income from the baseline (benchmark) level as explained earlier. The results presented below are based on the comprehensive FTA scenarios calculated in the CGE and present a minimum case (the very Comprehensive scenario yields similar results, but higher ones). In general, the AA has a poverty reduction effect across all the Central American countries. However, in the long run, it has a mixed result.

Short run results

- In the short run, Central American poverty is estimated to decline by 0.47 percent and 0.46 percent in the 'all countries scenario' and 'without Panama scenario', respectively (see Table 2.8). This is a minimum case estimate (comprehensive scenario); poverty reduction is expected to be more pronounced in the very comprehensive scenario.
- In the comprehensive short run case, the lower middle income countries Nicaragua and El Salvador with Honduras (relatively poorest countries of the Central American region) would face the largest reductions in poverty, while the least reduction is taking place in Costa Rica.
- Consumer prices are estimated to decline in all countries except for Costa Rica and Panama. Costa Rica again is expected to face significant rises in income as well as in prices; as the former effect is larger that the latter, poverty declines. In Honduras, El Salvador, Nicaragua and Guatemala both price effects (declining) and income effects (increasing) are beneficial for poverty reduction (the price effect relatively dominating the income effect).
- The results between the scenarios where Panama is included (all countries scenario) compared to where Panama is not included (without Panama scenario) show that especially Panama would benefit from an inclusion in the AA in terms of poverty reduction in the short run.

Long run results

- In the long run, Central American poverty is estimated to decline by 0.63 percent and 0.37 percent in the 'all countries scenario' and 'without Panama scenario', respectively (see Table 2.9). This is a minimum case estimate (comprehensive scenario); poverty reduction is expected to be more pronounced in the very comprehensive scenario.
- In the comprehensive long run scenario, large changes are observed for Costa Rica. Costa Rica's poverty ratio would decline significantly compared to the short run scenario with a highest decline in the without Panama scenario.
- El Salvador and Honduras are expected to face a further drop in poverty compared to the short run and seem to face the largest poverty reductions on average compared to other countries in the region. Nicaragua, which showed the largest poverty reduction in the short run, would face a slightly lower decline in poverty in the long run – which is in line with the fact that in the long run dynamic investments may move to other countries in the region as the CGE model has shown.
- Panama would experience a small rise in poverty due to AA in the long run, mainly due to the fact prices increase faster than income. This pattern is compatible with the Dutch disease phenomenon observed for Panama.
- In the 'all countries scenario', thus including Panama in the AA, the overall decline in poverty for the aggregate Central American region in the long run is expected to be slightly higher than in the short run. On the contrary, the long run effect if Panama is not included is slightly lower for the overall region than in the short run.

Table 2.8 Impact of AA on poverty, consumer prices and income, based on the Comprehensive scenario, Short run

	Baseline poverty ratio (%)	Percentage change in poverty ratio		Percentage change in consumers price		Percentage change in income	
		All countries	Without Panama	All countries	Without Panama	All countries	Without Panama
Costa Rica	18.60	**-0.157**	**-0.177**	1.22	1.22	1.32	1.33
Guatemala	54.80	**-0.309**	**-0.369**	-0.39	-0.48	0.10	0.11
Nicaragua	61.90	**-0.600**	**-0.623**	-0.49	-0.51	0.51	0.53
Panama	29.00	**-0.571**	**-0.028**	0.88	-0.04	1.37	-0.02
El Salvador & Honduras	58.21	**-0.591**	**-0.600**	-0.39	-0.40	0.51	0.51
All Central America		**-0.47**	**-0.46**				

Table 2.9 Impact of AA on poverty, consumer prices and income, Comprehensive scenario, Long run

	Baseline poverty ratio (%)	Percentage change in poverty ratio		Percentage change in consumer price		Percentage change in income	
		All countries	Without Panama	All countries	Without Panama	All countries	Without Panama
Costa Rica	18.60	**-0.825**	**-2.762**	1.23	0.00	1.76	1.78
Guatemala	54.80	**-0.481**	**-0.144**	-0.42	0.09	0.35	0.32
Nicaragua	61.90	**-0.392**	**-0.143**	-0.42	0.02	0.23	0.26
Panama	29.00	**0.247**	**1.198**	0.97	1.01	0.76	-0.02
El Salvador & Honduras	58.21	**-0.973**	**-0.724**	-0.37	0.01	1.12	1.12
All Central America		**-0.63**	**-0.37**				

Unlike in the short run case, even though both prices and income are expected to significantly go up in Costa Rica ('without Panama effect' prices remain rather unchanged), the large poverty reduction is mostly due to the dominating income effect. Lower decline in poverty in Nicaragua has been also due to the dominating income effect compared to the short run scenario. In the case of Panama the rise in poverty in long run is mainly due to higher increase in prices compared in income (which is even marginally declining in the case Panama is not included in the AA). In the other countries, the declines in poverty are mainly caused by expected decreases in prices and increases in incomes.

So, in general, the AA is expected to have a small but positive effect on poverty in the Central American region in the short run. Also in the long run poverty is expected to decline for all countries except for Panama, which would face a small increase in poverty. Nicaragua, El Salvador and Honduras, which are the countries with the highest poverty rates in the Central American region, would benefit of the AA in the short run (and to smaller extent in long run) in both scenarios.

2.4.3 In focus: Sugar

Partial equilibrium model GSIM is used to analyse the potential product-group specific effects of the trade-part of the AA on sugar production in Central American countries and in the EU.

Product group characteristics

Guatemala is one of the most important sugar producers in Latin America after Brazil, but its exports to the EU have been relatively small until now, as most EU imports come from other regions in the world. In addition, thanks to the preferential access of the ACP countries, these countries count for a relatively large share of the European sugar imports compared to e.g. the Central American republics. The demand and supply elasticities used are based on FAO estimation and the substitution elasticity is based on the GTAP value. In general, the demand and supply elasticities are very low in the sugar sector, while substitution elasticities between different sources of sugar are high.

Modelling results

We assume a Doha round reduction of 30 percent in tariff lines for sugar and a reduction of tariff rates for ACP countries to 0 percent in the baseline (effective as of October 1st, 2009). For this reason, when the EU sugar tariffs for the Central American countries are lowered by 30 percent in the limited scenario and by 90 percent in the comprehensive one, e.g. the Costa Rican and Guatemalan tariffs are still higher than the tariffs for ACP countries, albeit marginally so in the comprehensive case. The impacts of the EU-Central America AA are estimated to be very small as the below table presents.

In the limited scenario, Honduras, Costa Rica and El Salvador are gaining in terms of production increases, with a small 0.1 percent. There are differences between the limited and comprehensive scenarios: across the board we find that the limited scenario – compared to the comprehensive one – leads to lower gains for the countries that benefit and lower losses for those that stand to lose ground.

In terms of welfare effects the EU faces a decline in their welfare due to the negative effects on producer surplus (even though the production is not changing in percentage terms accurate to one digit) and tariff revenue, while the consumers benefit from the lower sugar prices. In addition, the producers in the non-LDC and ROW are expected to lose a little bit due to the very small increases in the sugar trade between the EU and Central American countries. Most of the positive welfare effects for Costa Rica, El Salvador, Honduras and Guatemala stem from the positive effects for producers, while the consumers face hardly any effects from the AA. **Error! Reference source not found.** shows the export figures in order to place the percentage changes in the two scenarios in perspective of absolute values.

Table 2.10 Partial equilibrium modelling results

Change in	CRI	PAN	ES	HON	GTM	NIC	EU27	RLDC	ROW
Limited scenario, 30% cut									
Output, %	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Producer surplus, mil $	0.13	0.00	0.14	0.16	0.05	0.00	-0.77	-0.02	-0.05
Consumer surplus, mil $	-0.00	-0.00	0.03	0.02	-0.01	-0.01	1.22	0.00	-0.27
Tariff revenue, mil $	0.01	0.00	0.03	0.03	0.02	0.00	-0.92	-0.00	-0.01
Net welfare effect, mil $	0.14	-0.00	0.20	0.20	0.06	-0.01	-0.46	-0.02	-0.33
Comprehensive scenario, 90% cut									
Output, %	0.2%	0.0%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Producer surplus, mil $	0.39	0.00	0.42	0.48	0.16	0.02	-2.31	-0.07	-1.48
Consumer surplus, mil $	-0.01	-0.01	0.08	0.05	-0.04	-0.03	3.69	0.01	-0.81
Tariff revenue, mil $	0.03	0.00	-0.06	-0.05	0.05	0.00	-5.10	0.00	-0.05
Net welfare effect, mil $	0.41	-0.01	0.43	0.48	0.17	-0.03	-3.73	-0.06	-1.00

3 Overview of Consultation Outcomes

The main methods used for consultation with civil society were outlined in Section 1.4. While Chapter 2 summarises the quantitative results, this section looks briefly at the qualitative results gained as a result of these consultations.

The full results are presented in Annex IV. In this section, we briefly summarise the results of the two public meetings (Table 3.1 and Table 3.4), bilateral in-depth interviews (Table 3.2) and the TSIA Workshop (Table 3.3). These tables include the participants in each consultation, their main comments and how these comments were implemented.

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Table 3.1 Results Overview – Public Meeting 2 February 2009

Presence at the Public Meeting	
Ondres Oravez (MPO), Mr Camilo Tovar (Asociación Latinoamericana de Organizaciones de Promoción (ALOP)); Charly Poppe (Friends of the Earth Europe (FoEE)); Johan Bosman (Coalition of the Flemish North-South Movement); Mr Christophe Zufferey (economiesuisse); EUCOFEL AISBL; Iana Dreyer (ECIPE); René Elodie (GENESSEAU); Sonia Gonzalez (SPP DG Comm); Kyoungmin Ko (Korean Mission); Mr Melih Özsöz (Economic Development Foundation (EDF)); Suna Orcun Tusiad (Turkish Industry and Business Association); Dr Mareike Meyn (Overseas Development Institute (ODI)); Mrs Alba Ridao-Bouloumié (Spanish Food and Drink Federation, Brussels Delegation); Mrs Roberta Adinolfi (European Apparel and Textile Organisation (EURATEX)); Mr Roberto De Giorgi (International Confederation of European Beet growers); Ms Marianne Nichols (Association of Poultry Processors and Poultry Trade in the EU); Ms. Isaure Manchon (European Services Forum (ESF)); Aslihan Tuncer (Undersecretariat for foreign trade republic of Turkey); Mr Francesco Mongera (Grupo Sur); Ms Constanza Negri-Biasutti (Association of European Chambers of Commerce and Industry (EUROCHAMBRES)); Rosa Jiménez; Anna Dydou-cackowskie (Mission of Poland, Ministry of economy); Mrs Chloé Calvignac (EURODOM); Mr Luc Hellebuyck (European Fruit And Vegetable Trade Association)	
Main points raised during the meeting:	**Incorporation of comments into the Report(s):**
• The languages used for the consultation process: will comments be accepted in Spanish? What language will be used at the Managua workshop?	• Central American experts from our partner *CDR* (Costa Rica) will be involved. We also have Spanish-speaking experts from our Spanish partner, *Corporate Solutions* and members of the ECORYS team are fluent in Spanish. The workshop will be simultaneously translated and all executive summaries will be published in Spanish. Our ToR stated that all reports should be submitted in English.
• Scenarios: What will the scenarios with successful implementation of DDA look like? Will you include Panama in any of the scenarios? Can you include Turkey in one of your	• The DDA assumptions are based on the latest available texts from December 2008. We will also base our analysis on the most likely FTA scenario. The ambitious scenario is not 100%,

scenarios?	but close to it. The limited 02-02-2009 Minutes Public Meeting TSIA EU- CA 3 scenario has reduced services liberalisation and potential exclusion of sensitive sectors, but we are still discussing the exact scenarios. • We will run Panama in at least one of our scenarios. • Our ToR did not request that the consultants study the effects on Turkey. We realise there may be issues regarding EU border control.
• Products: The effects on bananas and sugar	• For bananas and sugar, the assumptions will be presented in an overview table, but given that these will be at a more aggregate level (e.g. bananas under 'fruit and vegetables'), these cannot be presented specifically.
• Will the Sustainable Development chapter constitute part of your analysis?	• We will look at this issue across the study, since our main focus throughout is on sustainable concerns.

Table 3.2 Results Overview – Bilateral and Website Consultations

Bilateral consultations with Civil Society	
Elies Arps (WWF Costa Rica/Traffic); Charley Poppe (FoEE); Camilo Tovar (ALOP); Johan Bosman (Coalition of the Flemish North-South Movement); EUCOFEL AISBL; Alicia Valenzuela and Karin de Léon de Reyes (VESTEX); Juan Carlos García (SIECA); Georgina Muñoz Pavón (Coordinadora Civil); CC-SICA (Bayardo Altamirzno (Universidades), Miguel Ruiz (CST-JBE), Rogen Barrantes (CST-JBE), Victor Campos (Centro Humboldt/Iniciativa CID), Francisco Delgadillo (UPOLi)); Haydée Castillo (CC-SICA); Adolfo Sansolini (on behalf of the Royal Society for the Prevention of Cruelty to Animals (RSPCA), World Society for the Protection of Animals (WSPA), Compassion In World Farming (CIWF) and Eurogroup for Animals; Felicity Manson-Visram (One World Action); Peter Lunenborg (South Centre Geneva); Jesus Garza (CHAAC); Annelie Anderson (APRODEV); Sheila Page (ODI); Manuel Aragon Castillo (Forestry expert); Marta Prado, (International Trade and Development) on behalf of Humane Society International (HSI); Alejandro Salas and Jana Mittermaier (Transparency International); ILO Bipartite Meeting.	
Main points raised during discussions	**Incorporation of comments into the Report(s)**
• The inclusion of biodiversity, sustainable development and the implementation of international conventions in the policy recommendations.	• The policy recommendations include reference to biodiversity and the inclusion of a sustainable development chapter. In addition, our labour analysis encourages the implementation of ILO Conventions and we look at Multilateral Environmental Agreements and International Environmental Agreements in Chapter .
• The workshop and invitations to the workshop should be organised in an open and transparent manner. Information about the event should be available sufficient time beforehand to allow preparation. Organisations representing Indigenous populations and small farmers should	• We will endeavour to make the workshop organization as open and accessible as possible. Several organisations have been sent to us and included in our contact list.

be included as stakeholders.	
• Recommendations to review certain pieces of literature.	• These have been reviewed and included where possible.
• Methodological suggestions: Recommendations to include certain products, sectors and horizontal issues in the analysis, e.g. biofuels, fruits, nuts and vegetables (especially bananas and sugar), textiles, tourism, financial services, beans and rice.	• These suggestions have been considered and included where possible. Biofuels are included in our forestry analysis, bananas and sugar are studied in-depth in the fruits, nuts and vegetables analysis and financial services and tourism are looked at in our investment conditions chapter.
• Non-tariff measures (NTMs) are a hurdle to reaching full regional integration. A regional system should be created to harmonise SPS measures, customs procedures and create a conflict resolution mechanism.	• This has been considered, particularly in our horizontal issue analysis of investment conditions.
• You should consider the informal sector and labour regulations in your report.	• This has been considered in the labour analysis in Chapter 5.
• Indigenous populations and other vulnerable groups should be included in the study.	• Indigenous populations, women and children are examined as part of our labour analysis.
• Increased trade liberalisation can encourage animal rearing practices inconsistent with those accepted in the EU. Policy recommendations should include suggestions on how to include animal welfare in the AA.	• As land use for livestock is expected to decrease, these practices are not expected to expand. Recommendations for the inclusion of animal welfare in the AA have been included in Chapter 8.
• Provision of various pieces of literature.	• Reviewed for relevance and referenced where appropriate.
• The policy recommendations under the economic pillar should be more clearly linked to the ones under the environmental pillar.	• The policy recommendations should be read in conjunction as the three fields of sustainability are complementary. This has been added to the Executive Summary.
• Policy recommendations should be added to the textile and clothing sector regarding enhanced cooperation on border control and programmes to promote joint investment between EU and Central American firms.	• These recommendations have been added to the textiles and clothing sector-specific recommendations.
• Recent events in Honduras highlight the need for strong language on political governance.	• Several recommendations have been made on compliance with international standards on issues related to political governance

Table 3.3 Results overview - Workshop in Managua, Nicaragua

Workshop Attendees
María Alicia Valenzuela (VESTEX); María Pía Hernández Palacios (ICCO); Elies Arps (WWF); Eva Carazo (MOACO); Jesús Leonel Garza Chinchilla (CHAAC); Carlos Alfredo Flores Rivera (Unidad Ecologica Salvadorena); José Antonio Morales (Christian Aid); Juan José Amate (CAM); Edgardo Benitez & Yenibeth Medina (Asang Launa); Joe Thompsom & Ulises Vallecillo (Nicaraguan Chamber of Commerce); Jaime López Badia (El Salvador Ministry of Ecomony); Alejandro A Arauz Laguna (A.Arauz Consulting & Associates); Beatriz

Cabrero (SETEM); Ezequiel Provedor (CARE International); Nicolas Bulte, Lucrecia Cibrian, Michele Schmit (EC Delegation Central America); Samuel Buc (FUDI); Lilliam Flores Martínez (New Holland Apparel Nicaragua); Stefano Abruzzini (DG Employment); Martha Pérez (Unión Internacional para la Conservación de la Naturaleza); Victor Campos Cubas & Luz Saavedra (CID); Manuel Aragón (Forestry expert).	
Main points raised during discussions	**Incorporation of comments into the Report(s)**
• Important sectors for consideration: fisheries, public procurement, handicrafts, bananas and sugar; tourism.	• These suggestions were taken into account during our sector selection.
• Highlighting of issues on labour displacement, biodiversity, vulnerable populations (including indigenous groups); water management, deforestation, non-tariff barriers.	• These useful suggestions have been taken into consideration while compiling this final report.
• Clarification sought on particular modelling results and model limitations.	
• Useful input provided on some sectors suggested for in-depth analyses: textiles, forestry, investment conditions and fruits, nuts and vegetables as well as various reports including impact assessments, CAFTA evaluations and sector-specific analyses.	• This additional information has been used when completing this final phase.

Table 3.4 Results Overview – Public Meeting 14 July 2009

Workshop Attendees	
Constanza Negri-Biasutti (Association of European Chambers of Commerce and Industry (EUROCHAMBRES)), Annelie Andersson (Association of World Council of Churches Related Development Organisations in Europe (APRODEV)), Regina Hosner (Bundesarbeitskammer Österreich), Patrick Pagani (Comite Européen des Fabricants de Sucre (CEFS)), Luc Hellebuyck (European Fruit and Vegetable Trade Association), Luisa Santos (European Apparel and Textile Organisation (EURATEX)), Pascal Kerneis (European Service Forum (ESF)), Tom Jenkins (European Trade Union Confederation (ETUC)), Silvia Melegari (Federlegno-Arredo), Simon Pettinger (Freshfel – The European Fresh Produce Association), Roberto de Giorgi (International Confederation of European Beet Growers), Wim Moningka (Product Board for Horticulture), Theo van Bemmel (Product Board for Horticulture), Lourdes Peroni (Transparency International EU Office), Christian Günther (VPMA), Astrid Moreno (Embassy of El Salvador).	
Main points raised during discussions	**Incorporation of comments into the Report(s)**
• The CGE model does not include investment.	• The CGE model does include investments as the long-run scenario allows for dynamic adjustment capital from investments to adapt and reallocate based on comparative advantages.
• There should be more focus in the report on services	• The estimated change in output for the EU services sector are 0%. Improvements in investment conditions will be most interesting for the EU services sectors.
• Central American countries are expected to gain on public services. Could you provide more information?	• This is a general equilibrium effect. The trade flows are likely to increase and therefore demand for public services will also increase.

Table 3.5 Results Overview – Workshop San José, Costa Rica 28 July 2009

Workshop Attendees	
Carlos Molina (CC-SICA), Jorge Coronado (Comisión Nacional de Enlace – Alianza Social Continental), Manual Cordero Alarcón (Universidad de Costa Rica), Francisco José Valerio (CEDIL Asemblea Legislativa de Costa Rica), Bernardo Aguilar González (Fundación Neotrópica), María Elena Mayorga (Fundación Neotrópica), Paola Herrera Montero (Fundación Neotrópica), Monica Solis Chavarria (Grupo Aequitas), Edgar Talavera (ACICAFOC), Omar Salazar (ASEPROLA), Giovanni Veluchi (CDR), Ariana Araujo (CDR).	
Main points raised during discussions	**Incorporation of comments into the Report(s)**
• It is important to update the policy recommendations in line with what is already there in the negotiations / texts and make them a bit more specific, especially in the social and environmental pillar.	• Regarding the monitoring mechanisms, from the study we objectively conclude that this is very important, thus we recommend it.
• The positive effects on poverty reduction depends to a large extent on policies in the field of education, health, access to employment, fiscal reform, etc.	• Although we address poverty issues in the report, this has now been highlighted further in the policy recommendations.
• The current crisis affect Central America significantly; much more than this FTA, also because the US is the most important foreign market for CA. This should be reflected in the study.	• This study tries to isolate the effect only of this FT A relative to the baseline. The crisis is very important, but the isolated effects of this FTA in the long run still stand. This might imply that while the baseline growth rate declines due to the crisis, the effect of this FTA is that the decline will be slightly less pronounced.
• The Executive Summary gives some contradictory statements on environmental impacts: not much impact on deforestation ←→ a large potential impact on it resulting from land use changes	• It has been clarified that while the direct impacts are low, the indirect impacts could be higher.
• Improvement of social dialogue and participation of civil society is crucial, especially in the social and environmental field.	• In the report it has been clarified further that involvement of civil society is recommended both in the social and the environmental pillar; the environmental pillar now contains this separately.

4 Summary of in-depth analyses

Based on both the quantitative and qualitative results, five sectors and one horizontal issue have been analysed in-depth. The full sectoral analyses can be found in Annex V. Below, the main impacts and conclusions for both regions in relation to these sectors and horizontal issue are summarised.

4.1 Fruits, vegetables and nuts

4.1.1 European Union

- **Economic**: Output of the EU FVN sector is expected to decline by a maximum of 1.4 percent; exports are expected to decrease and imports increase. This is a direct effect of specialisation according to comparative advantage as a result of further trade liberalisation between the EU and Central America. For some EU producers in the sector, this would imply a decline in income and a need to reallocate resources towards other products; these impacts may be relatively pronounced in regions in the EU where production of FVN is concentrated. It may imply an incentive to either increase efficiency in production of these fruits, or reallocate resources to other uses. As trade flows increase in the sector, the EU is expected to import 1 percent more FVN products from Central America, around € 13 million in absolute terms. EU exports are expected to decrease by 1.5 percent. Consumer prices also decline, implying a positive welfare gain from a consumer perspective.

  With respect to the product group bananas, the partial equilibrium model showed an expected output decline for the EU of 2.0 and 2.1 percent (comprehensive and very comprehensive scenario respectively). This model also showed a very small decline in the net welfare, as the positive effect on the consumer surplus and the negative effects on the producer welfare and the tariff revenues almost counteract each other.

- **Social**: As production in the EU FVN sector is regionally concentrated, the expected fall in employment as a result of declining output – though small – may be felt in some regions especially. The scenarios show a decrease between 0.9 and 1.5 percent. Within all the scenarios, the change for skilled and unskilled labour is the same. The expected decrease in employment and production – though relatively small – could also indirectly adversely affect relative poverty levels, given that there are more unskilled workers in the FVN sectors (respectively 0.93 percent of the total unskilled labour in the EU and 0.09 percent of the total skilled labour in the EU). The impact on other social issues, such as health, education and equality, will be closely linked to

the employment impact and is expected to be similarly small. The impact on these issues will also depend on the availability of alternative employment or adequate social protection systems.

- **Environmental:** The projected output decline for the EU FVN sector has only negligible impact on environmental indicators. The two main areas for the environmental impact of this AA for the fruits, vegetables and nuts sector[17] are indicators of environmental conditions on human health (related to air pollution, drinking water quality, contamination of soil, food security and accumulation of hazardous chemicals), and indicators of the state of the environment. Mostly these changes are slightly positive, especially for Southern Europe. However, increasing output in Central America flows will increase the global greenhouse gas emissions. In addition, increasing trade flows and marine transport will cause pressures on marine pollution, biodiversity and waste management. The changed state of the environment of this agricultural subsector relates mainly to sustainable use of natural resources, loss of biodiversity and water and natural resource use in agriculture.

4.1.2 Central America

- **Economic**: Output of the FVN sector in Central America is expected to increase considerably, especially in Costa Rica (output increases of 20 to 23 percent) and Panama (output increases of 58 to 65 percent). The other countries of the region are also expected to gain, though to a smaller extent. Real incomes are increasing considerably, but domestic prices in the sector are also expected to increase, implying that the producer surplus will increase considerably. For consumers, there is a positive income effect (from increased employment) on the one hand and a negative effect from higher domestic prices on the other hand. A clear trade specialisation process is expected, by which Central America further specialises in production according to its comparative advantage. Trade impacts are positive for the whole region, impact magnitudes varying across countries. Because of specialisation, import will also increase (implying intra-sectoral trade increases, though only modest) provided that NTMs such as market access, SPS measures and Rules of Origin are reduced. This specialisation process can improve knowledge- and capital-intensive processes. In addition, organic production in vegetables and fruits is expected to increase in Central America as demand in EU for this type of production is high.

  With respect to the product group bananas, Costa Rica and Panama would benefit the most from the trade part of the AA, though the rest of the Central American countries also gain to a lesser extent. In percent terms the output change is expected to be 1.9 to 2.0 percent in Panama (in the comprehensive and very comprehensive scenario respectively) and 1.4 to 1.5 percent in Costa Rica. The net welfare effect is significant for both countries, because of the increase in producer surplus, $ 60.6 million and $

[17] Fruit and vegetables are important crops in value terms. They represent 30% of the total EU27 crop output. Their production distribution among the EU-27 countries can be both very wide (for example, apples) and highly concentrated (for example, eggplant). In general, climatic conditions in the south of Europe are favour the production of fruit and vegetables. Source: Eurostat 2007.

65.4 million for Costa Rica and $ 22.3 million and $ 24.1 million for Panama (comprehensive and very comprehensive scenarios respectively).

- **Social:** Increased employment opportunities, especially for unskilled labour is expected to have considerable positive effects on reducing poverty and income inequality. Yet, two aspects need to be kept in mind. First, attention needs to be given for spreading the gains across the Central American countries that participate, to avoid the risk of strong increases in income divergence in the region, as well as of increasing differences in business opportunities for large export-oriented producers and SMEs and small (subsistence) farmers with less access to capital, technology and knowledge. Some migration flows can be expected from Nicaragua, Honduras and El Salvador towards Costa Rica and Panama as a result of increased demand for unskilled labour. Secondly, it must be noted that the large involvement of informal employment in the sector could imply that the employment effects will be less pronounced than the model outcomes would suggest due to the formalisation effect - i.e. part of the jobs are filled by people previously working informally in the sector, thus real employment effects may be more limited than predicted. Other consequences of increased FVN production could include changes in land use, with some potential consequences for the livelihoods of indigenous populations; increased prices for produce which means gains for producers and mixed gains for consumers (overall income increases through higher employment, but so do consumer prices); and negative health effects from the use of pesticides and other hazardous substances is expected to decrease with the AA, as higher SPS and other standards will apply to Central American producers wanting to export to the EU, though there will be a push for more efficiency and productivity that might have the opposite effect.

- **Environmental:** The increase in output in Central America as well as increased (maritime) transport flows will increase global greenhouse gas emissions. Land use for FVN production will also increase moderately in Nicaragua and Guatemala and significantly in Costa Rica (13 percent) and Panama (40 percent), though the AA might also provide considerable opportunities for improved efficiency in production and transport modes and use of greener technologies. Increases in output will increase CO_2 emissions from the Central American FVN sector and will also create new threats to biodiversity as more land is used for agricultural purposes. However, the latter effect may be tempered due to a decrease in land use for cattle (substitution effect).

4.2 Forestry

4.2.1 European Union

- **Economic** and **social** impacts in the forestry sector in the EU are expected to be small to negligible in the EU, as output, prices and employment are not expected to change. Trade and investment opportunities may arise, especially for forestry management services and equipment, while trade in forestry services may also be given a boost by the AA in combination with other EU environmental policies.

- **Environmental**: The environmental impacts of the EU-Central America AA are considered to negligible for the EU forestry sector, while at the global level – thus also affecting the EU – there is a potential increase in global GHG emissions if deforestation is not adequately addressed. On the positive side the opening up of trade and investment opportunities in forest based environmental services may have positive impact on mitigation of climate change issues and the export of EU 'green' technologies.

4.2.2 Central America

- **Economic:** Overall economic impacts for the forestry sector are expected to be limited as a consequence of the relatively small size and importance of the sector and low base values of trade flows. A limited impact – in percentage terms – on forestry output is expected, while trade flows – mainly exports – are expected to increase for all countries. Increased trade flows will partially depend on the addressing of some infrastructural bottlenecks in e.g. Nicaragua.

  Small increases in output for paper and pulp are expected in Guatemala, Nicaragua and El Salvador / Honduras, while all countries are expected to see a decline in the output of wood products. The interconnected nature of the sector and high level of informal / illegal activities may imply that outcomes are underestimated and this warrants close monitoring of developments with regards to illegal logging, biofuels production, enforcement issues, etc. The FTA/AA (in combination with national policies and measures) may enhance the region's potential for developing forestry based environmental services and non-wood forest products (NWFPs)

- **Social:** The substantial involvement of informal workers and indigenous (poorer) groups in the sector is likely to imply that employment impacts – although limited overall – may be more pronounced for these marginalised groups, potentially having a positive effect on poverty reduction. The same holds true for the possible development of forestry based environmental services and NFWP, the latter which have benefited particularly indigenous groups (e.g. in Peru). It must be noted though that also in this sector, the large involvement of informal employment in the sector could imply that the employment effects will be less pronounced than the model outcomes would suggest due to a formalisation effect. If land use and property rights of particularly small-holders and indigenous communities are not properly protected, the increased activity in the sector could benefit only a small group of large producers and would thus have limited poverty alleviation effects.

- **Environmental:** Although direct impacts of the AA on the environment through increased outputs of forestry and forest based sectors are expected to be limited and as such are not likely to affect logging practices substantially, indirect impacts may be more pronounced. For instance, competing land uses such as for vegetables, fruits and nuts and for bio-fuels production may put pressure on forested areas.

  Insofar as increased activity in the sector and linked sectors are not flanked by adequate addressing of illegal logging and wood processing, the ultimate impacts of

trade liberalisation may be negative for land and water quality, biodiversity and natural resources use.

In making these assessments one needs to keep in mind that in the grand scheme of Central American deforestation issues, the EU-Central America AA is only one of the contributors to the overall problem. Moreover, through the AA and flanking policy measures there are opportunities to address in a more coordinated way the issues at play. The relative lack of a well developed bio-fuels policy and framework in Central America could result in unsustainable practices such as threatening forest areas and regional food security once trade is further liberalised and demand increases.

4.3 Textiles and clothing

4.3.1 European Union

- **Economic:** Increased trade and investment opportunities may encourage outsourcing of clothing manufacturing to Central America, but this is an 'optimistic' assessment and it is more likely that investment increases in Central America also come from other sources, such as iron and steel and petroleum, services, and other country-specific sectors. As a market Central America is less attractive, due to its low levels of GDP, relatively small populations and fragmented nature; with longer term predicted income growth in the region, this may change in the mid to longer term, in which case especially higher-end EU products should see market opportunities emerge in the region. Again, this is an optimistic assessment and crucially hinges on the addressing of some pervasive NTMs in Central America, including issues on RoO and IPR.

- **Environmental and Social:** Overall sustainability impacts for the EU textiles and clothing sector are expected to be marginal. Textiles output may in fact increase slightly, especially in more technical textiles, which could result in a more pronounced effect in some regions / sub-regions.

4.3.2 Central America

- **Economic:** While the T&C sector in the Honduras, El Salvador and Guatemala should grow, Costa Rica and Panama will experience negative impact. Nevertheless the size of the Textile and Clothing industry in these last countries is so small that the real impact overall could even be positive since lower prices would benefit consumer more than producers in the sector would lose. The AA is expected to have a positive impact on investments, however, we expect these to originate mainly from Asia and the US, as the AA provides access to EU markets for producers in Central America. The RoO and IPR regimes play an important role in the extent to which this will take place.

  Increase in the trade relations with the European Union countries in this sector will increase exports somewhat – even if the distance is a hurdle – and improve the trade

balances. It may also open up opportunities for diversification of export markets and reduce Central America dependence on the US market, although this impact is expected to be small.

- **Social:** The expected increase in employment, especially of Central American women, is expected to reduce the levels of poverty and mitigate illegal immigration to the US. Moreover, also an increase of internal immigration is foreseen towards the urban centres where *maquilas* are located, offering new employment opportunities. For social effects to be positive, it should be noted that efforts to include the small-scale (domestically oriented) textile producers need to be made.

- **Environmental:** In the short term, the increase in production is expected to generate some negative pollution effects as well as pressure on urban services, the quality of water and local pollution levels in urban communities where the *maquilas* are located. The increasing demands of the new internal migrants on public services, education, access to clean water, health services, etc., will undoubtedly be a problem which will have to be balanced with investment in infrastructure and services in these areas.

4.4 Electronics

4.4.1 European Union

- **Economic:** As a result of the AA, the sector is expected to contract in terms of output, employment and exports. The contraction is however only marginal (less than 0.5 percent). Real income will decrease as a result of the effects of the AA on the sector. As imports increase, the trade balance for the electronics sector will deteriorate slightly, although the change will again be small. This will serve to further expand the existing deficit in computer-related goods which the EU already has with Central America. The higher imports do lead to lower prices for electronics products, benefiting consumers. The impact of the AA of investments in the sector is expected to be negligible.

- **Social:** The AA is expected to have a small negative effect on employment (up to -1.4 percent), for both skilled and unskilled labour and in all scenarios. In certain EU regions where the sector is particularly dominant the effects could be larger but this is dependent on the effects on various subsectors as this will directly impact the few companies active in the sector in these areas. These same country-specific effects could mean increases in unemployment there and thereby lower real incomes. In addition, as the sector has a relatively high rate of female employment in Eastern European countries in particular, the AA will have a marginal negative effect on gender equality. The effects on other social indicators are negligible.

- **Environmental**: the overall environmental impact of this AA is considered to be negligible in magnitude as in the long run the EU 27 electronics industry is expected to have less than 0.4 percentage change in the annual production output. In addition, the EU will be affected by the positive impacts on Central America electronics

industry output and the resulting global CO_2 emissions, but this increase is negligible when compared to total global CO_2 emissions. Slight changes are expected in some indicators as a result of increased output. These include the use of water, natural resources and energy.

4.4.2 Central America

In general, the effects on all Central American countries except Costa Rica should be placed in the context of the low relative importance of the sector in the overall economies.

- **Economic:** While the electronics sector is not an important sector in most countries in Central America, it is a very important sector in Costa Rica, among others as a result of the availability of skilled labour and active government policies to attract foreign investments, which culminated in the attraction of Intel a decade ago. According to the CGE model, in this country the electronics sector stands to gain from the AA in terms of output, employment (both skilled and unskilled) and trade. While in other countries such as Guatemala, El Salvador and Honduras the effects are also significant in percentages, they are small in absolute terms. The Nicaraguan electronics sector is expected to decrease slightly.

  The prices of electronics are expected to increase in all Central American countries, except Nicaragua. However, given the small proportion of income spent in the sector, the effects for consumers will be insignificant.

  Costa Rica is expected to increase the amount of imports of products such as circuits and electronic microstructures sector and exports in the sector are also expected to increase there as well as in El Salvador and Honduras, further integrating the country (and region) in the global supply chain. Investments in the sector are also expected to rise, but these are more linked to the global economic situation rather than the AA.

- **Social:** The employment effects in Costa Rica are positive and significant and other countries such as Guatemala, Honduras and El Salvador are also expected to experience positive employment effects. Nicaragua could see a slight reduction in employment and Panama could see a significant reduction if it is included in the AA. Nevertheless, the AA's impact the impact on poverty and equality will be limited, given the dominance of high-skilled labour in the sector, the involvement of several non-Central American firms, and the relatively low involvement of female labour. On a similar note, the changes in the electronics sector caused by the AA are not expected to have significant effects on the health care or educational system, although multinationals may set up educational programs (in cooperation with public universities) and health programs as part of their corporate social responsibility and to ensure future human resources.

- **Environmental**: The projected increased output in the sector is expected to increase carbon emissions and energy use. While these issues give reason for concern, the electronics sector's direct impact on the environment is relatively small. The impact

of the AA through this sector specifically is expected to be negligible. Further inclusion in global production networks may lead to 'greener' production in the sector.

4.5 Maritime transportation services

4.5.1 European Union

- **Economic**: For the EU maritime transport sector, the direct economic impact as a result of the AA is expected to be very limited, given the large size of the overall sector in the EU as well as the relatively small transport flows between the EU and Central America as a percentage of total EU flows. Given the overall increase in trade flows between the EU and Central America, a potential positive impact – though small – can be expected in the broader field of maritime products and services (including exports of transport equipment from the EU). The potential impact for the EU is mainly dependent on the extent to which auxiliary and port services (cargo handling, freights forwarding, but also onward transportation possibilities) in Central America are improved and NTMs such as divergent customs procedures and SPS measures are reduced and the investment climate improved (allowing improved door-to-door services through multi-modal service provision or efficiently contracting local companies).

- **Social**: Given the small output and trade effects, hardly any employment effects are expected for the EU maritime transport services sector. Depending on the extent of increased investment effects and the reduction of NTMs especially in Central American ports, there could be economic benefits for both regions, which could have a small indirect yet positive effect on employment, especially in auxiliary logistic and transport services. A positive effect on employment would mean additional opportunities for unskilled workers as they are particularly active in this sector.

- **Environmental**: The overall environmental impact of increased marine transport between the EU-27 and Central America will very slightly increase global CO_2 emissions and there is some risk of increased marine pollution and the entry of alien species into the EU-27. All other environmental impacts are assessed to be negligible.

4.5.2 Central America

- **Economic:** The Central American maritime transport sector is expected to expand slightly as a result of the AA, both in terms of output as well as export value (for all Central American countries, except Costa Rica). In line with this effect, domestic prices in the sector are expected to decline slightly (with the exception of Panama). Overall, these changes are expected to have no major effect on GDP per capita. In general, sector growth will rather depend on a synthesis of intra-regional facilitation of transport services, both for road and water, as well as viable investments for improving the regional port infrastructure. The expansion strategy of Panama in relation to the Canal is expected to strengthen its current predominant position. In

addition, the introduction of the AA could serve to stimulate trade facilitation and NTM reduction which in turn encourages transparency and thereby leads to a better functioning of the sector. A secondary effect of such efforts can be increased integration in global supply chains and transportation networks that can in turn better facilitate the expansion of the FVN sector, for example.

- **Social**: In line with slightly increasing output and exports, employment in the sector in Central America is expected to increase slightly (for all Central American countries except Costa Rica). Given the large absolute number of unskilled labour in this sector in Panama, the percentage change is expected to have most impact there. The fact that unskilled labour in particular is expected to benefit, may have some small positive effects on poverty and income inequality. With respect to labour issues, if these standards are improved, this could in turn improve productivity and thus services will become more efficient. The risk exists that there could be a lack of enforcement of labour regulations in a context of increased competitive pressure. Convergence with EU standards in this field through Corporate Social Responsibility initiatives, improved legislation and enforcement, could improve transparency and may positively affect labour conditions. Under state control however, maritime services tend to lose effectiveness and their long term purpose.

- **Environmental**: As a result of the fact that the level of maritime activity has doubled during the last decade and a half, atmospheric pollution has increased accordingly. Increased trade flows as a result of the AA are expected to increase global emission levels from long-haul shipping, though these increases will be relatively small compared to the baseline values. Existing threats in the Central America region regarding air quality, land and water conditions (wetlands, marine biodiversity and waste management), aggravated by fragmented sectors and scantly empowered environmental bodies in the region, could increase slightly as a result of increasing trade flows. On the other hand, the AA could help in providing incentives to further reduce emissions and environmental distress by using cleaner technologies as well as improving standards along with the monitoring and enforcement mechanisms of those standards.

4.6 Investment Conditions

On the basis of our in-depth analysis, it appears that the impact of improved investment conditions will be minimal for the EU, but could potentially have a large impact on Central America as investments increase there. Below are some brief conclusions on these impacts.

4.6.1 European Union

- **Economic**: The economic gains for the EU are expected to be insignificant. Economically, improved investment conditions (through reduced NTMs and regulatory divergence in Central America) and liberalisation in certain sectors will improve transparency and a more accessible business climate for EU firms from those sectors wishing to establish in Central America. These projects are also expected to

lead to higher returns at lower risk levels. This could lead to a minimal increase in GDP per capita. In addition, improved investment conditions are expected to stimulate trade flows further which may mean cheaper imports of certain products to the EU and thereby a wider choice for consumers and a marginal positive income effect.

- **Social:** Improved investment conditions may have a slightly positive impact on employment in the EU, especially for firms active in sectors that export to Central America. This includes the manufacturing and transport equipment industry which accounts for 48 percent of EU total exports to Central America, as well as chemicals and related products and manufacturing goods (14.3 percent and 7.2 percent of total exports to Central America, respectively) which are also important export sectors to Central America[18].

  Given the link between other social indicators and employment and since employment effects are expected to be mostly small, the impacts on poverty, health, education and equality will also be small.

- **Environmental**: The estimated environmental impacts on atmosphere, land, biodiversity, environmental quality and on fresh and waste water related to improved investment conditions of the EU-Central American AA are considered to be insignificant or negligible for the EU27. This statement is based on the fact that all changes for environmental indicators would remain at less than one percent of the current EU27 baseline. However, the overall increase in global greenhouse gas emissions would require mitigation.

4.6.2 Central America

In summary, the trade part of the EU-Central America AA could be highly beneficial for Central America as European investment in the region grows, but these positive effects are dependent on the reduction of intra-regional NTMs and trade facilitation.

- **Economic:** Reduced intra-regional NTMs are key to allowing Central America to reap the benefits of improved investment conditions under the AA. Freedom from these restrictions could make the region more efficient and help to promote it as a target market for investors from the EU and other countries. As FDI flows increase, trade flows are also likely to increase, stimulating further GDP growth, income increases and products available to consumers at lower prices. Certain firms may have a comparative advantage when investing in the EU through low production costs and investment in natural resources by EU firms are expected to increase. These benefits will, however, not be immediately apparent and Central American companies will require time to adapt to the AA and to learn new methods of diversification, particularly in those sectors where outputs are expected to reduce, including financial and business services.

[18] EC (2008), *EU Bilateral Trade and Trade with the World : Central America.*

- **Social:** As more EU investors establish in the region, employment opportunities may grow and infrastructure may be improved. In addition, given that European investors may demand more transparency and respect for human rights in the region when investing there, this could mean an improvement for labour and social conditions (i.e. increased salaries for high and low-skilled workers in the long-run) in general for Central Americans. Allowing investments to spread beyond the international export-oriented firms and beyond the export-sector into domestic sectors and towards SMEs would significantly increase their positive social impact.

  Education, healthcare and skills could improve as these are geared more to investor needs (i.e. provision of on-the-job training, language courses, improved health and sanitation facilities and technical assistance). A match between higher education programmes and economic and commercial needs from the private sector is imperative for positive effects of investments. Higher investment in certain sectors where (indigenous) females are particularly active, such as agriculture and textiles, may have a positive effect on gender equality.

- **Environmental:** Improved infrastructure and increased employment means extra pressure on the environment, particularly due to higher CO_2 emissions and increased demands on natural resources. Labour migration to urban areas, for example, will mean higher water and energy consumption. The attraction of heavy industries such as chemicals and construction could potentially cause increased water and land pollution and increased investment in the forestry sector could encourage yet more illegal logging. However, increased investment by EU firms in environmental goods and services, and integration of Central America firms in international production networks, could allow mitigating factors to neutralise harmful effects.

5 Main Economic Sustainability Impact

This chapter summarises the main economic impacts that are expected for the EU and Central America as a result of the AA.

When looking at both the macro-economic outcomes for the various scenarios produced by the CGE model as well as the sector-level in-depth analyses, it is clear that:

- The AA is expected to bring economic benefits both to the EU and Central America.
- The positive economic impacts from the very comprehensive scenario are expected to be more beneficial than those from the comprehensive one.
- Panama is expected to benefit in relative terms from participating in the AA; the rest of the region is not significantly affected whether Panama is included or not.

Below, the economic impacts will be summarised according to the economic sustainability indicators used in this TSIA.

5.1 Real income

At a macro-economic level, the expected impact of the AA on real income in the EU is positive (between €622 million and €2286 million, depending on the scenario). As a percentage change from the EU baseline value (2018), this change is consistently negligible for all scenarios.

For Central America, national income in all 6 republics (for Panama only applicable if joining the AA) is expected to increase as a result of the AA, and the extent of this increase depends on the scenario:

- Costa Rica: between €330 and €925 million, representing 1.3% to 3.5% of GDP.
- Nicaragua: between €21 and €80 million, representing 0.2% to 0.8% of GDP.
- Guatemala: between €54 and €369 million, representing 0.1% to 0.6% of GDP.
- El Salvador: between €133 and €503 million, representing 0.4% to 1.6% of GDP.
- Honduras: between €112 and €423 million, representing 0.6% to 2.2% of GDP.
- Panama: between €248 and €574 million, representing 0.8% to 1.9% of GDP, if Panama joins the AA. If Panama does not participate, the expected effect on national income is between -/- €5 and -/-€7 million, mainly due to relative preference erosion vis-à-vis the other Central American republics.

Overall, the greatest relative gains are projected over the long run for the deeper set of scenarios.

At sector level, the effects on real income identified in the in-depth analyses can be summarised as follows:

- For the EU, given its large baseline sizes and the relatively limited importance of Central America as a trading partner for the EU, impacts on real income (e.g. through increased output, employment and/or wages at sector level) are expected to be negligible.
- In the EU, a slight decline in output is expected in FVN (up to 1.4 percent) and electronic equipment (less than 0.5 percent), as a result of specialisation according to comparative advantage between the EU and Central America. From a producer perspective, this implies a slight negative effect on real income, possibly pronounced in some regions, while for consumers overall there is a small positive effect on income, as prices are also expected to decline very slightly in these sectors.
- In Central America, output, export and employment (positively impacting real income) is expected to increase considerably in the FVN sector, mostly for Panama and Costa Rica. The electronic equipment sector stands to gain considerably in Costa Rica.
- Overall, production and trade flows at sector level for the EU and Central America are expected to change according to further specialisation in line with comparative advantage. Such a process can be observed *between* the EU and Central America, for example in the FVN sector, in which Central America has a comparative advantage, and transport equipment, in which the EU has a comparative advantage. Yet, this process can also be observed *within* the Central American region, as illustrated by the relative shift of production activity of electronic equipment from Panama and Nicaragua towards El Salvador, Costa Rica and Honduras. Another example is the textiles & clothing sector, where a relative shift can be observed from Costa Rica and Panama towards Honduras, El Salvador, Guatemala and Nicaragua.
- The extent of potential positive impacts on output and real income in the services sectors, including maritime transport services, depend to a large extent on the degree of successful regional integration, liberalisation and NTM reduction in the Central American region, including logistic bottlenecks and regulatory divergence between the countries.
- Price effects – also impacting real income – are mixed throughout the Central American region, varying across sectors and across countries. Along with boosts in output (and increased in land prices), prices for some agricultural products are expected to increase, especially in Costa Rica and Panama, and to a much smaller extent in Nicaragua and Guatemala. Overall, prices in most sectors in Guatemala, Nicaragua, El Salvador and Honduras are expected to decrease in the long run for the very comprehensive scenario, mainly in secondary and tertiary sectors (chemicals, insurance). A drop in prices is also predicted in the financial and insurance services sector in the region.

5.2 Investment – fixed capital formation

Investment flows are expected to increase as a result of the AA and are expected to have potential indirect beneficial effects, especially in Central America. Given the size of the economy as well as current investment conditions, overall effects are expected to be negligible in the EU area. Central America can, however, benefit considerably from

increased investment. Investment condition amelioration at a regional level in Central America is expected to have an overall beneficial effect, inducing increased EU investments, but also intra-regional investments and FDI from other parts of the world.

When looking at the CGE modelling results, the difference between the short and long run results is indicative for the extent of this effect, as in the long run capital is assumed to be mobile and allowed to reallocate among sectors while adjusting to the steady state.

- In the very comprehensive long run scenario including Panama, the increase of national income in the short run for the EU is €738 million, while in the long run this is €2286 million, the difference being attributable partly to reallocation of capital.
- For Central America, the long run national income effects in that scenario are also considerably larger (more than double in most countries) in the long run than in the short run (except for Nicaragua and Panama).

The FDI gravity analysis shows that the additional impact on sector output induced by changes in FDI as a result of implementing the trade part of the AA with the EU are positive for Central American states, though the extent of these effects varies by country.

- In Panama, Nicaragua, and Guatemala, additional effects for some sectors are equal to or above 1 percent of value added. In Costa Rica the effects are less than 1 percent.

Though these results should be interpreted with caution, the outcomes reflect the indirect pro-competitive effects of trade and specialisation, partly facilitated by investment. Reduced tariffs also imply lower cost of investment and higher return on investment, illustrating the non-zero-sum-game nature of the trade part of an AA between the EU and Central America in which trade and investment reinforce each other.

The potential benefits from investment flows especially in Central America is largely dependent on the extent:

- To which regional integration in the Central American region is facilitated, especially addressing intra-regional horizontal issues like customs procedures, labelling requirements, IPR and investment climate amelioration; and
- To which the investments not only flow to export-oriented large firms, but spread and disperse into the more domestically focused small producers.

For maritime transport and related services, the effect is also dependent on the extent to which logistic and transportation bottlenecks can be tackled (e.g. port infrastructure).

5.3 Trade

Overall, trade flows between the EU and Central America are expected to increase, especially for Central America. The macro-economic CGE results show increases in trade in the Central American countries in all scenarios.

- The percentage changes in total export value and total import value of the EU with the rest of the world as a result of this AA are negligible in all scenarios, due to the relatively low ranking of Central America as an EU trade partner regarding trade value.
- For the Central American countries, the percentage changes in overall export value vary between 2.2 and 18 percent in the various scenarios including Panama. The

percentage changes in total import value vary between 1.2 and 21 percent. For Panama, some very slight negative impacts are observed when not joining the AA, while imports and exports increase considerably when joining.

At sector level, the following trade patterns can be observed.

- The sectoral trade effects reported relate to overall trade, thus not only between the EU and Central America, but with the rest of the world, reflecting changed trade flows also as a result of external competitiveness effects of the trade part of the AA.
- Trade specialisation – and thus production patterns – is expected to take place both between the EU and Central America as well as within the Central American region. An example of the latter is the trade specialisation pattern observed in the textiles & clothing sector, where estimated impacts in El Salvador, Honduras and Guatemala are positive, and negative in Panama and Costa Rica, indicating a relative change in production concentration in the region.
- In the FVN sector, Central America is expected to ameliorate its sectoral trade balance considerably. Especially Panama and Costa Rica are expected to increase their export values by up to 61 and 167 percent, respectively.
- In electronics, EU exports will decrease very slightly, while Costa Rica in particular is expected to increase its exports (as well as imports, though relatively less). In the EU, a slight increase in exports of transport equipment is observed, while exports from Panama especially are expected to decrease.
- In most services sectors in the Central American region, intra-sectoral trade will potentially increase, as both imports and exports are expected to increase (for Nicaragua, the results are mixed). In the long run, FDI is expected to potentially play an important facilitating role in these sectors. The extent to which investment conditions can be ameliorated will be a crucial conditional determinant of the extent of such effects.

6 Main Social Sustainability Impacts

The main social sustainability impacts relate to employment, wages and labour issues as well as the related issues of (gender) equality, vulnerable social groups, education and health. The main impacts expected in the context of this AA are discussed below. Employment an wages are discussed first, separately from labour issues, including ILO decent work and other related themes, though these are obviously very interrelated.

6.1 Employment and wages

In line with changing production structures and trade patterns causing reallocation of resources among sectors, employment will shift accordingly and effects therefore differ between sectors and countries. The Annexes show the estimated sectoral changes in employment.

- In the EU, the employment changes as a result of the AA will be negligible in the majority of sectors. There are some small negative impacts to be expected in the FVN sector, the consequences of which may be felt in regions where production is concentrated in the EU.
- In the Central American region, some considerable incentives for relative reallocation of labour between sectors is observed. In all countries except Panama, these changes are mainly caused by “pull-factors”, i.e. workers are pulled towards expanding export sectors by higher wages. This means that while there will be a substantial impact on Central American labour markets, these are positive mechanisms at play, with workers relocating in response to rising wages and increased labour market demand. This pull mechanism is expected to have most impact in Costa Rica, but also a considerable influence on the rest of the region. Panama is the only consistent outlier; labour market displacement is negative (push factors, in the context of decreasing wages) and rather substantial.
- Employment in the motor vehicles & parts sector and the transport equipment sector in Central America is expected to drop, though with small absolute values. This is sustained both in the short-run and the long-run as dynamic effects pull employment towards sectors where higher wages draw in workers, like FVN in Costa Rica and Panama and electronic equipment for Costa Rica, Guatemala, El Salvador and Honduras.
- For Nicaragua, Guatemala, El Salvador and Honduras, a similar effect is expected to occur with a pull from the textiles sector. Overall, as with output changes, Costa Rica and Panama see employment gains in electronic equipment and FVN, Nicaragua and Guatemala see employment gains in textiles, machinery and chemicals, rubber & plastics, and El Salvador and Honduras – ‘in the middle’ – see gains in electronic equipment, FVN and textiles.

- Some migration of mainly unskilled labour towards Costa Rica and Panama as a result of the large increase in demand in the FVN sector can be expected.
- In general, increased specialisation and incentives for efficiency improvement is expected to lead to higher productivity, mitigating employment increases in expanding sectors to a certain extent.

The macro-economic results (CGE) also give an estimation of the changes in labour income (wage levels), that result from changing demand for labour.

- In line with the limited effects on employment, wage levels in the EU will be virtually unaffected.
- In Central America, both skilled and unskilled wage levels are expected to increase slightly in Costa Rica and Nicaragua, between 0.2 and 1.3 percent in most scenarios, and for Costa Rica up to 3.2 percent for unskilled wages in the very comprehensive scenario in the long run (including Panama). Guatemala also sees some rising wage level estimates, though in some scenarios there are slightly decreasing skilled wage levels observed. No macro-level wage estimates are available for Honduras and El Salvador.
- The main changes in the Central American region are expected in Panama which shows slightly decreasing wage level estimates in the scenarios in which it is included. This is a result of the Dutch disease phenomenon, in which dependency on some very strong sectors negatively affects the other sectors in the economy, in this case resulting in decreasing wage levels at a macro-economic level.

The overall observed upward pressure on wages in the Central American region reflects the macro-economic expectation of increased employment and demand for labour. The estimates on increasing wage levels are likely to be upper bounds, especially for the unskilled wages. This is due to expected formalisation effects – i.e. especially in unskilled labour markets, increased demand may very well be filled immediately by an influx of workers from the informal economy (not included in the model), releasing the upward pressure on prices as a result of increased demand in the face of relative scarcity as assumed in the model. Rather than rising wages, the increasing demand for labour may then translate into increasing formalisation of workers from the informal economy and decreasing hidden unemployment. It then depends on the accuracy and penetration of the tax system, how much the economies can benefit.

6.2 Labour issues

There are severe labour-related issues in Central America such as child labour, gender inequality and forced labour, and it must be emphasised that many of these are linked. For example, if wages are kept low in a desire to exploit the country's comparative advantage in cheap labour, families are forced to supplement their income by having as many family members as possible at work, including children.

Agreements with developed regions such as the AA with the EU provide opportunities to improve upon these challenges, as has been indicated during the consultations held in Central America, in particular, through the inclusion of various international agreements on labour standards (e.g. 'The 2008 Declaration on Social Justice for a Fair

Globalisation' which specifically prohibits the violation of worker rights for the benefit of comparative advantage). In addition, the inclusion of a sustainable development or labour chapter can serve to identify these issues and the means to tackle them. If the EU insists upon standards being met in the production of goods to be exported there and the implementation of ILO Conventions, then this could benefit Central American workers, in particular the most vulnerable groups (women, children and indigenous populations). However, the means to do this must come from domestic will to do so and cooperation of Central America countries with the EU, for example through EU funds offered for stimulating tripartism and social dialogue through the ILO and the political dialogue and cooperation pillars of the AA. In addition, a monitoring and evaluation system of labour issues, such as that included in the EU-Chile agreement, should also be put into place following implementation of the agreement. The Sustainable Development Chapter could also implement the enforcement mechanisms implemented as a result of the DR-CAFTA White Paper including employer sanctions, the provision of direct support to labour unions, and urging governments to create laws to regulate employment subcontracting.

The following issues are relevant in each region:

European Union

- The EU performs well in the ILO DWA indicators which include employment opportunities, remuneration and working conditions. Social dialogue is also well-developed, particularly in the west and north of the region.
- Despite this good performance, some issues remain. These include gender inequality in employment and unemployment rates and the generally higher representation of women in traditionally 'female' sectors such as education, health and social work which serves to emphasise the division further. Forced labour is an issue in certain European countries, with trafficking of women for sexual exploitation as an issue of particular concern.

Central America

- A large proportion of workers (60 percent) are active in the informal sector. The effects on these groups are difficult to assess given the lack of data on the informal sector, but need to be included in the policy space within the trade part of the AA or flanking it.
- Despite the application of labour laws in theory, issues of concern remain as regards freedom of association, social dialogue, forced labour and unpaid overtime.
- Vulnerable groups such as women, children and indigenous populations suffer from disadvantaged positions. Females have higher rates of unemployment and lower salaries. Indigenous populations are affected by poor labour conditions in the informal sector and child labour is prevalent in all six countries. Some sectors which employ these groups especially (i.e. women in the textiles sector) will see growth in output and employment in certain countries (such as Guatemala) through the introduction of the AA which will in turn impact these vulnerable groups positively.
- In addition, in those countries where those same sectors suffer employment decreases (to use the textiles example once more – Costa Rica and Panama), other sectors (e.g. electronics) will increase in output and thereby wages will be

higher. This will serve as a pull factor for those working in sectors whose outputs will decrease.

6.3 Poverty

The effects on poverty are mainly induced from the combination of income changes in the economy on the one hand, as a result of changed output, as well as employment and wage levels, and changes in prices on the other hand.

With respect to employment levels, it was concluded above that overall employment is expected to increase (at a macro-economic level, though obviously differences among sectors exist) in Central America, with the exception of Panama. With respect to poverty, increases in unskilled employment opportunities are particularly relevant. Especially the large expected increase in unskilled employment opportunities in the FVN sector is expected to have a positive effect on poverty reduction.

The poverty analysis conducted quantifies the expected poverty effects in Central America as a result of this AA by looking at the expected relative changes in income against relative changes in prices.

- Overall, the AA is expected to have a slight positive effect on poverty reduction in the Central American region; a reduction of poverty levels in the long run of 0.63 percent is expected in the comprehensive scenario including Panama.
- Consumer prices are estimated to decline in all countries except for Costa Rica and Panama. Costa Rica is also expected to experience significant rises in income and prices. As the price effect still dominates the income effect in all countries, the region is expected to face a decline in poverty as a result of the AA.
- In the short run, the least advanced countries of the region, i.e. Nicaragua, El Salvador and Honduras would face the largest reductions in poverty, while the least reduction is expected to take place in Costa Rica. In the long run, larger reductions are observed for Costa Rica, with the highest decline in poverty expected when Panama does not join the AA. El Salvador and Honduras are expected to face a further drop in poverty compared to the short run and seem to face the largest poverty reductions on average compared to other countries in the region. Nicaragua, which showed the largest poverty reduction in the short run, would face a slightly lower decline in poverty in the long run.
- Especially in the long run, poverty reduction is higher for the overall region if Panama joins the AA. In the short run, it does not matter for the overall region results whether or not Panama joins. In the long run, Panama is the only country experiencing a slight increase in poverty levels mainly due to a higher increase in prices than in income, but this increase is much smaller if Panama joins than if it does not.

These effects on poverty can be seen as minimum case estimates (analysed for the comprehensive scenario); effects are estimated to be more pronounced in the very comprehensive scenario.

6.4 Equality and gender issues

Given the very limited impacts observed in the EU as a result of the AA, impacts on income inequality or gender inequality are expected to be negligible.

With respect to income inequality in Central America, the following (indirect) impacts can be derived:

- The macro-economic wage effects give an indication of impacts on inequality. As mentioned, wage levels of both skilled and unskilled labour are expected to increase. For all Central American republics, unskilled wage changes are more positive that skilled wage changes (or less negative for Panama in some scenarios), implying a slight relative decrease in income inequality levels within the countries.
- With respect to income inequality between countries in the Central American region, the highest relative gains (in percentage of GDP) are expected for the two richest countries in the region, Costa Rica and Panama (if participating). This implies a slight increase in per capita income differences between countries. However, all countries – including the poorer ones - stand to gain from the AA. This is confirmed by the results from the poverty analysis that show that Honduras and El Salvador seem to face the largest poverty reductions on average compared to other countries in the region.
- With respect to income inequality at sector level, there is a risk that increased specialisation patterns and an orientation to export within some sectors, such as the FVN sector, may be of benefit to firms which are already more efficient and relatively large, while SMEs and small-scale (subsistence) farms may not be able benefit from the new opportunities and could even face a relative competitiveness erosion.

With respect to gender issues and the position of indigenous peoples, the effects in some sectors like textiles & clothing (high share of female labour) and agricultural sectors (making use of land) may be of influence.

- Female workers in Honduras, El Salvador and Guatemala are expected to benefit relatively more than men from the expected increases in employment in the textile and clothing sector, as the share of female employment in this sector is relatively high. However, female workers in Costa Rica and Panama may be facing challenges, in a declining textiles sector, to shift to other sectors in the economy. Overall, the effect on gender issues is not so pronounced.
- In increasing sectors where land is used as an important resource, like the FVN sector, increased demand for land may induce pressure on some living areas of rural population and indigenous peoples.

An improvement of (facilities for) social dialogue as a result of the AA might have a positive effect on mitigating the risk of exclusiveness and improving labour market participation, in particular for women and people of indigenous descent.

6.5 Education

In Central America, no major (direct) effects on education are expected.

- An indirect positive effect on education can result from higher income levels and slightly reduced poverty levels.
- The fact that Central America is expected to expand in some primary sectors like FVN, while the auto parts and transport equipment sectors are declining, could have a slight indirect negative effect on education incentives.
- Although import increases in the services sectors in Central America generally outpace export increases, increased intra-sectoral trade in services may induce knowledge diffusion. However, as there is no significant overall growth expected in the tertiary sectors in the region, no increased demand for skilled labour and incentive to education are expected from the services sectors.
- Overall, technology dissemination as a result of intensified trade relations and specialisation effects can in the long run induce higher incentives to education and more knowledge-intensive production in various sectors.

No direct effects on education in the EU are expected as a result of this AA. Indirectly, this AA may - as a further example of ongoing specialisation processes in which the EU is transitioning (according to its comparative advantage) towards higher value-added and technologically advanced products as well as services – reinforce the incentive to promote and invest in knowledge and innovation in the EU.

6.6 Health

In Central America, some small indirect effects on health are expected.

- The large expansion in the FVN sector is expected to increase the use of pesticides and other substances potentially harmful to human health. On the other hand, improved compliance with SPS measures, as required for the EU export market, may lead to observing higher standards in hygiene, heath and safety.
- Increased investments by EU firms and more exports destined for the EU may positively influence labour standards and working conditions. However, increased competitive pressure can also increase tendencies to violate decent work standards, especially in sectors which compete on prices (e.g. lower value-added textiles, where more vulnerable workers also tend to be active), inducing a so-called “race to the bottom”. The inclusion of a labour or sustainable development chapter in the AA could help to raise health and safety standards in these sectors, thus assisting the avoidance of this tendency and thereby improving the health of Central American employees.

For the EU, no substantive impacts on health are expected. A slight indirect effect results from increased imports of agricultural commodities, associated with a slight increase in the risk of entry of alien species.

7 Main Environmental Sustainability Impacts

7.1 Atmosphere

A slight negative impact on the amount of global GHG emissions as a result of the AA is expected. The CGE model estimates the change in annual CO_2 emissions as a result of this AA:

- The largest share of CO_2 emission annual changes as a consequence of the AA stems from the EU (63 percent of the total additional annual CO_2 emissions). As a share of total EU emission levels, this increase is negligible.
- Emission levels in the deeper scenario (very comprehensive) are significantly (20 to 30 percent) higher than in the comprehensive scenario. Also, emissions in the long run scenarios are larger than in the short run.
- Increases in GHG emission in the Central American region in the long run are mainly estimated to come from El Salvador, Honduras and Costa Rica.

At the sectoral level, effects on the atmosphere differ among industries and countries:

- The large increase in production of FVN may be harmful to GHG absorption capacity in the region, though this may be (partially) mitigated by the fact that increased resource allocation of land towards this activity and away from livestock, which is more emission- intense. Insofar as such competition for land puts pressure on forested areas, there is a negative impact on climate issues to be expected.
- Increased maritime transport (especially long shipping) as well as road transportation, as a direct consequence of growing trade flows, is expected to lead to increased GHG emission levels.

Given the increasing global priority for mitigating climate change at a global level, increased trade-relations may also induce incentives to investment opportunities in e.g. (forest-based) environmental services, which can induce long term positive impacts on the atmosphere. Similarly, intensified trade relations may facilitate the diffusion of the use of greener technologies further.

7.2 Land use

Change in annual natural resources use is included as an indicator in the CGE model. The following model results should be interpreted with caution, given that the model only allows for estimations of expected tendencies, rather than exact predictions of change in land use. Expected changes may for example result in changing price levels for different types of land, rather than direct conversion:

- Land use for grains and livestock is particularly expected to decline in Costa Rica and Panama in favour of land use for FVN. Honduras and El Salvador will experience a similar effect but at a lower level.
- The EU will experience the reverse effect in land use.
- These effects are most pronounced in the very comprehensive scenario whereby land use reallocation intensifies along with changes in output and employment.

At a sectoral level, the following impacts are expected on land use: A projected decline in agricultural sectors such as FVN, will have a slight positive impact on land use and natural resource stocks in the EU. Land use in FVN production is expected to increase significantly in Costa Rica (13 percent) and Panama (40 percent). However, in combination with increased productivity, land use will also become more efficient.

- Wetlands are under threat in most of the coastal areas of Central America and may be further threatened if port areas are enlarged and maritime frequency increases on coast lines. The areas of most concern are those with low land protection, along the Caribbean coast of Honduras, Nicaragua and Costa Rica.

7.3 Biodiversity

Increased agricultural use in both regions could potentially lead to a loss of biodiversity, which is important, because a large share of the world's biodiversity is concentrated in the Central American countries. Reductions in output in the EU are expected to have a positive impact on the formation and maintenance of natural value farmland (especially in Southern Europe) which is expected to have a positive though negligible impact on protected areas and ecosystems in the EU27. In addition, as production increases in Central America, if waste and waste water produced by factories is not adequately taken care of (i.e. dumped in natural water sources or land), mining activities are not closely controlled, and illegal logging not addressed, biodiversity issues could become more pertinent. This warrants close monitoring of environmental standards in production plants and policy regarding mining activities and illegal logging.

At a sectoral level, the following impacts may be seen:

- As FVN production in Central America increases, new threats to biodiversity will be a concern as land is used for agriculture purposes while the use for other purposes is not significantly decreased.
- Central America is home to many rare species of plants and animals that depend crucially on the tropical forests. Sustainable forest management thus affects not just local, but global biodiversity issues.
- Similarly the EU biofuels policy could have a substantial impact and this warrants close monitoring. Honduras and Nicaragua and Guatemala are increasing the land allocated to palm oil for biofuels, which could put further pressure to move the agricultural frontier into the forested areas. Likewise, El Salvador is increasing the land used for sugar cane plantations for biofuels, and reducing other crops, including that of its basic staple, corn.
- Increasing marine transport will increase the risk for marine pollution and potential entry of alien species into the EU-27. In the long run this may pose a threat to a

number of species in the EU27. In Central America, port development could threaten diversity in countries such as Costa Rica, Nicaragua and Honduras. However, the AA outcome in this regard, is less relevant than simplification of trade regulations in Central America itself. The latter would have a larger bearing on the equilibrium of coastal ecosystems.

7.4 Environmental quality

Increasing trade volumes and marine transport will slightly increase pressures on waste management especially on harbour areas and storehouses. The amount of packaging waste which is potentially harmful to human health, may increase slightly. In addition, increasing transport will increase the consumption of transport fuels and energy resources both in the EU27 and Central America.

On a sectoral level, we also see various changes in environmental quality:

- Organic farming as well as the use of greener and more efficient production methods in the expanding FVN sector can contribute to enhancing environmental quality.
- Growing output of the electronics sector in both regions will directly increase use of energy resources, leading to potentially negative environmental effects.
- Increased maritime transport can directly impact urbanisation near harbour areas, put pressure on waste management in coastal areas and harbours and increases the use of transport fuels and energy resources in harbours in both regions. Also, the quantity of water use and amount of waste water generated could increase.
- The Panama Canal expansion project deserves special attention, as it would entail an entirely new lane of traffic along the Canal through the construction of a new set of locks. Water-saving basins will be built next to the new locks, designed so as to reuse 60 percent of the water in each transit. This technology would eliminate the need for constructing dams, flooding or displacing communities along the watershed. Whether this will materialise through existing environmental norms, or will be influenced by the AA, remains to be seen.
- With respect to FDI, two effects are possible. First, a ‘race to the bottom’ caused by attempts to attract scarce FDI resources may lead to a lowering of or non-enforcement of environmental standards. Second, inclusion of production in global production networks and related FDI flows may enhance ‘greener’ production. Policy determines which effect may come to dominate.

7.5 Fresh and waste water

In general for both the EU and Central America, increased sea pollution as a result of increased trade flows induced by this AA can pose the risk of increased environmental (water) pollution, as well as to e.g. fisheries. For the EU, the biggest impact on water pollution is expected from the maritime services and the textile sector. In relation to this AA however, there are no large impacts expected for these sectors for the EU, implying the effect on water is limited. At sector-level, the AA might induce some effects ion Central America, that are included in the summary below.

As regards fresh water supplies and waste water management, some impacts can be observed at sector level:

- Increased FVN production in Central America may have a negative impact on drinking water quality but a projected decline in EU FVN output will have slight positive impact on the quantity of water use there. This positive impact would mainly benefit Southern Europe.
- Unless increased activity in the forestry sector is flanked by addressing the issue of illegal logging, this could also serve to contribute to water scarcity and reduced water quality (through salinisation). The AA would be a minor contributor of many other factors to this effect.
- Increased production in the Central American textiles industry which uses chemicals in dyeing and other finishing processes, and thus produces potentially harmful wastewater. Similarly, the attraction of FDI in certain heavy industries (i.e. chemicals, construction and petroleum refineries) could mean increased water contamination and an increased amount of waste water. These effects are not expected to be substantial, but warrant close scrutiny, as inadequate environmental standards can have significant and lasting impacts on water and other natural resources, as well as on health of both workers and people living close to factories.
- Increased maritime transport and investment in the EU may cause slight increases in the generation of waste water.

7.6 Deforestation

Although the direct impact of the trade part of the AA on the forestry and forest-based sector is expected to be limited, the expected increases in land use especially for the expanding FVN sector can have a negative effect on forest areas. Close monitoring of potential secondary effects, particularly related to deforestation and climate change is required.

- In Central America, increased investment in the forestry and agriculture sectors might stimulate illegal logging for timber production or agricultural frontier expansion if policies are not established to control these. Flanking measures will be needed to mitigate the harmful secondary effects of deforestation including reduced land and water quality. In the EU, purchases of illegally logged timber or products made thereof, needs to be clearly discouraged and limited.
- In Europe, climate change already appears to impact many sectors of society. Higher temperatures and more intense droughts are producing a rising trend in the number and severity of forest fires in the Mediterranean. These threaten forestry, farming, tourism and the suitability of the land for habitation. The contribution of the EU-Central America AA to these processes will be so small that it is hard to attribute to the agreement per se, but rather to the overall trends of which it forms a part.
- On the positive side, to the extent that the AA opens up increased opportunities for provision of forest based environmental services, it may also assist in mitigating climate change issues. And, as the AA also leads to increased dialogue and assistance with regards to sustainability issues and possibly (flanking) negotiations on FLEGT/VPA, environmental impacts could be positive. Both the EU and Costa Rica have considerable experience with sustainable forestry management, to which FLEGT might contribute in order to reduce illegal logging in the medium to long run.

8 Policy Recommendations and Flanking Measures

Based on the outcomes of the quantitative and qualitative analyses performed, this Chapter provides policy recommendations and flanking measures to the trade-part of the AA to be negotiated between the EU and Central America. The quantitative and qualitative analyses performed have identified the potential positive and negative effects of an EU-Central American AA by highlighting the potential economic, social and environmental impacts. Given these findings, the policy recommendations aim at suggesting flanking measures that can help enhance positive impacts and prevent or mitigate negative ones.

Overall policy recommendations are divided into those directly related to the trade part of the AA and those not related to the trade part. In addition, some sector-specific policy recommendations are derived from the in-depth analyses. These recommendations are provided by the research team and do not reflect any commitment from the Commission or the Central American governments.

8.1 Policy context and approach

Modelling assumptions

The impacts identified in this TSIA are partly based on the CGE and other modelling techniques used, implying that they are influenced by the assumptions underlying these techniques. Some of these assumptions directly relate to the policies measures of the parties involved, implying that it may seem as if a policy measure is already in place even though it is a model assumption that has specific impacts *if* agreed and implemented.

For instance, both scenarios and especially the very comprehensive one implies trade facilitation and removal of NTMs through the AA, which in turn crucially hinge on the implementation of policies related to trade facilitation, SPS measures, IPR enforcement etcetera. Thus, some rules of trade are implicit in the model, but require policy action beyond the lowering of tariffs and removal of NTMs within the clauses of the AA alone. Another example is the assumption of successful completion of the Doha Round in the baseline scenario (2018).

Policy and socio-economic context

While negotiating and subsequently implementing the AA – including preventative, mitigation and enhancement measures – both the EU and the Central American Republics need to be aware of the socio-economic and policy context in which they are being

implemented. The AA and its mitigating and enhancing measures have a socio-cultural context in which they are implemented. Context factors (including political pressure, silent resistance, geographical distribution effects, etc.) may lead to different outcomes in the dynamic interplay between implementation of the AA and its mitigating and enhancing measures and the effect this has on the socio-cultural environment. It is therefore imperative to keep the following risks and challenges in mind for the AA:

- The aforementioned factors may cause certain regulations and liberalisations to not fully achieve the internalised social and environmental externalities despite the fact that they set out to do exactly that;
- Given the high involvement of civil society and broad extent of public debate in Central America, it is important to have a two-way involvement between civil society and public policy makers. In order to achieve implementation of effective, optimal mitigating measures for sustainable development, it is important for civil society to take a responsible and vocal role so as to ensure the broad and often varying interests are adequately represented.
- It is vital to have adequate monitoring and evaluation mechanisms, making sure the effect of policy measures are monitored, reviewed and if necessary amended.

Ongoing structural transformation processes and regional integration

The impacts assessed in this TSIA for the AA between the EU and Central America should be seen in the context of ongoing structural transformation processes within the EU, within Central America and at a global level. In line with this, some of the impacts expected in the AA can be seen as a reinforcement or acceleration of already ongoing structural adjustments. Likewise, policy recommendations should take these processes and the ensuing policies into account.

Despite the fact that the AA is agreed between the EU and the Central American region, implementation will to a large extent take place at a national level in the Central American republics, as there are few truly regional institutions with strong mandates like in the EU – a situation which may limit some of the positive impacts identified. Given the large disparities within the region as well as the diverging levels of institutional development, processes may take long and some differentiation will continue to exist. A large challenge in general for the region lies in striking a balance between national and regional approaches and interests. Further regional integration and institutional and regulatory convergence will greatly enhance the effectiveness of the EU – Central American AA and its flanking measures and benefit the peoples of Central America.

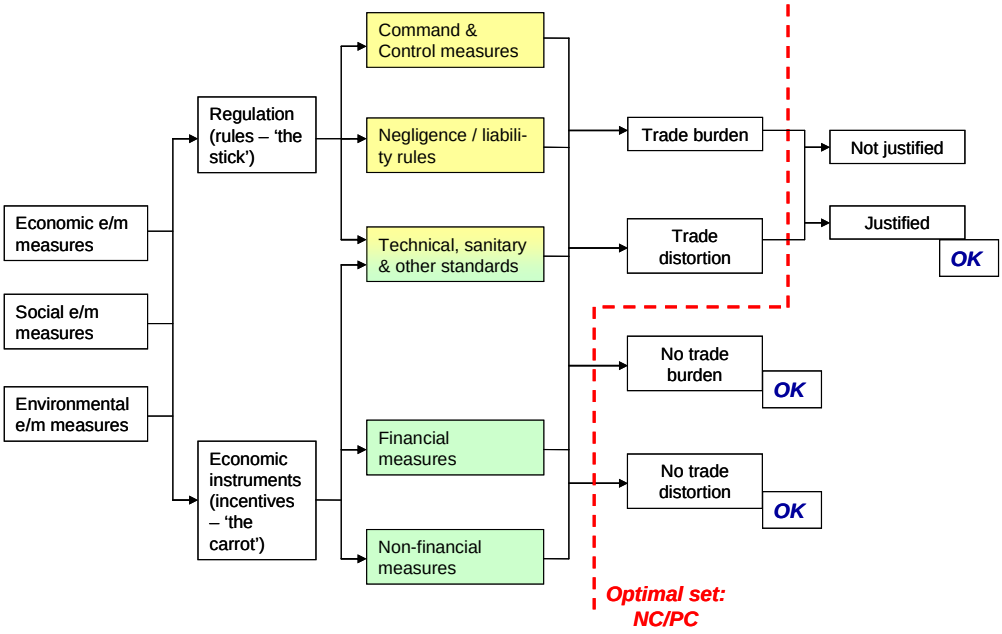
Mitigating and enhancing policy measures

Taking into account the above-mentioned challenges, a large mix of instruments can be employed in order to generate the desired outcomes. There are two main approaches to mitigating and enhancing measures: the legal approach through regulation and the economic approach through economic instruments. A schematic overview of choosing the optimal set of mitigating and enhancing measures policy measures is in Figure 8.1. Schematically, we need to look at:

- Which measures to employ (from Command & Control[19] to Non financial measures);
- Assess whether these measures create trade burdens or distortions;
- Assess whether they meet the normative and positive criteria for an optimal policy mix (the dotted line);
- If the measures create a trade burden or distortion, assess whether these are justified;
- Subsequently determine the preventative, mitigation and enhancement measures to be imposed: those that do not create trade burdens and/or distortions and those that do but are nonetheless deemed justified.

Several preventative, mitigation and enhancement measures which do not create trade burdens or distortions may then be implemented. Several environmental and/or social regulations and economic instruments that may create trade distortions or burdens knowingly can also be implemented if they fit in the ex ante agreed decision making framework as 'justified'.

Figure 8.1 Mitigating and enhancing measures - overview



Approach and principles

The overall approach to this AA and its implementation should be positive and cooperative, providing a sustainable basis for extending the EU – Central American relations. The following approach is taken:

- **Building on existing cooperation and taking a positive approach**; This AA is clearly part of a more general process of enhanced cooperation and dialogue between the two regions, that is increasingly built on mutual interests and reciprocity and as

[19] The OECD defines Command & Control (CAC) policy as: "policy that relies on regulation (permission, prohibition, standard setting and enforcement as opposed to financial incentives, that is, economic instruments of cost internalisation." This approach has e.g. been used widely with respect to environmental damage brought about by economic activities.

such has graduated from a purely assistance based form of cooperation. Our analyses indeed confirm that closer cooperation and integration bring mutual benefits – both between the EU and Central America and within Central America. The trade-part of the AA should therefore build on the positive experiences, initiatives and relations built up over the past decades and maintain the policy and technical dialogue and co-operation that has been established through these means. The mainstreaming of trade into these overall assistance programmes and cooperation agreements will enhance policy coherence and encourage further economic integration between the two regions and sustainable development.

- **Continue to promote the international and multilateral trade liberalisation and convergence processes;** The EU continues to be a strong advocate of the multilateral approach to trade and investments. Progress in the multilateral trade arena – and particularly the completion of the Doha Round – will support the successful implementation of this AA as well. Moreover, cooperation between major global trading partners such as the US and EU and more generally OECD countries on particular standards can have a positive impact on closer integration between the EU and Central America as well, insofar it contributes to the development of globally accepted standards. In this case the costs of compliance would be relatively lower than those pertaining in the event of large divergences between standards and requirements in the different export markets.

8.2 Overall policy recommendations

8.2.1 Policy recommendations related to the economic pillar

Overall, the economic effects of the AA are expected to be positive for both the EU and the Central American republics. However, the AA is expected to enforce or induce certain (ongoing) structural adjustment processes that may lead – especially in the short run – to some negative externalities. Economic policy interventions can help mitigate such negative externalities as well as enhance the positive gains that lead to long-term sustained economic growth. Table 8.1 below summarises the economic policy recommendations in context of this AA, both for the trade part and the other two pillars of the AA, political dialogue and cooperation.

Table 8.1 Main economic policy measures

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
1. Continue promoting regional (economic) integration and regulatory convergence in Central America while considering the experience of other Latin American regions in regional integration.		√
2. Provision of technical assistance and capacity building in addressing NTMs, especially SPS, TBT and trade facilitation	√	√
3. Stimulate ongoing investment and business climate amelioration	√	√
4. Improve infrastructure and promote port development (also outside Panama)	√	√

5. Support efforts facilitating structural adjustment across sectors in the short term resulting from implementation of the AA	√	√
6. Allow for phasing in of tariff reductions at sector level over time, especially for those sectors where social and environmental impacts will be high	√	
7. Improve the taxation system to widen and deepen its coverage		√

1. Continue promoting regional (economic) integration and regulatory convergence in Central America;

Economic development of the region is found to be hampered considerably by internal barriers within the Central American region, such as differing customs procedures, technical regulations and labelling requirement, SPS measures, fiscal regulations and competition policies. For many of the potential (positive) impacts identified in this TSIA, the extent to which such effects materialise depend to a large extent on whether these issues can be addressed and regional economic mobility can be improved. Ongoing efforts and commitments to reduce internal regional barriers (e.g. through SIECA) should be stimulated and enforced through policy measures.[20]

2. Provision of technical assistance and capacity building in addressing NTMs;

In order to ensure that enabling mobility through reduction of NTMs is effective, institutional capacity building, e.g. including customs and regional economic agents may be required. Also, in order to ensure inclusiveness of the opportunities for sustainable economic development promoted through NTM reduction, technical assistance e.g. in the field of meeting SPS and TBT standards for international markets as well as export promotion assistance may be of specific importance to smaller-scale economic entities like SMEs – possibly at cluster level. Apart from scale (small firms vis-à-vis larger ones), there may be a regional focus in such assistance as well, for example in the FVN sector in Nicaragua in order for parts of that sector to grow along with and compete internationally alongside Cost Rica and Panama.

3. Stimulate ongoing investment and business climate amelioration;

Amelioration of the investment climate especially for the services sectors both in the EU and in Central America can lead to large benefits for both regions. In Central America, such amelioration consists of reducing foreign ownership restrictions, improving competition policy and strengthening market forces (e.g. phasing-out state aid in port services), strategic deregulation and effective conflict mechanism on investment issues. Further regional integration in Central America may have a large positive influence on attracting FDI, though given the regional differences inhibiting this process, finance and technical support with implementation can be provided in order to address these challenges. To emphasise the positive effects of the improvements in investment conditions and promote some inclusiveness of the benefits, technical assistance and capacity-building for local and national governments and SMEs is needed and the political dialogue and cooperation pillars can help to address these.

[20] Specific recommendations are made to the Government of Honduras in a report by Morazán and Negre (2008), *Análisis del Impacto del CAFTA en Honduras y Recomendaciones para las Negociaciones de un Acuerdo de Asociación con la UE.*

4. Improve infrastructure and promote port development (also outside Panama);
Transport services – crucial for facilitating trade and development – can become a bottleneck in the development of the Central American region. Regional port development and infrastructure is important for both intra- and extra-regional mobility, including short-shipping from Panama to the rest of the region. Also, improved onward transportation from ports can reduce trade costs considerably and facilitate efficient door-to-door trade in goods or multi-modal services.

5. Support efforts facilitating structural adjustment across sectors in the short term resulting from implementation of the AA;
Structural adjustment processes that are beneficial in the long run, are likely to come with some adjustment cost in the short run; the deeper the FTA, the deeper such short-run costs (with the higher gains in the long run). In some cases, it may be needed to look at the possibility of short-term transition agreements or funding of structural transition efforts by way of the cooperation pillar. In the EU, the globalisation fund can be applied.

6. Allow for phasing in of tariff reductions over time, especially for those sectors where social and environmental impacts will be high;
Similarly, increased specialisation according to comparative advantage increases overall efficiency and improves welfare, but may come with considerable adjustment costs. Also, labour displacement among sectors and reallocation of land use may require some adjustment time. Especially in sectors where output and employment losses are envisaged, where female employment rates or the role of vulnerable indigenous groups are relatively high, where land reallocation is envisaged or where risks of biodiversity loss or deforestation are present, it may be considered to phase in tariff reductions over a longer period, in order to allow for smoother adjustment processes including appropriate surrounding policy initiatives and legislative or institutional adjustments, benefiting those affected adversely. This should be done in parallel with improvements in relevant legislation and its enforcement and the promotion of sustainability standards and their monitoring.

7. Improve the taxation system (widening and deepening it);
In order to benefit from the AA and broaden the Central America governments' policy space, especially when – through formalisation – the informal sector becomes more formal, the scope and depth of the taxation systems in the Central America countries needs to be looked at. When the labour force increases, the tax revenues should be positively affected, allowing the governments policy space to further strengthen some positive effects and mitigate negative ones.

8.2.2 Policy recommendations related to the social pillar

Many of the social effects identified in this TSIA are closely related to the structural transformation processes addressed in the economic pillar above. Social externalities should be seen in that context and specifically included in the overall policy dimension. Social policies will mainly relate or stem from reallocation effects of labour across sectors and the implications thereof, as well as changing employment opportunities and conditions.

Table 8.2 Main social policy measures

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
1. Include a Sustainable development chapter in the AA, including related support, addressing social and environmental issues related to the trade-part of the AA. Social issues may include: a. (Enforcement of) international labour standards b. SMEs c. Strict monitoring and evaluation systems d. Positive indirect effects on labour standards e. Working conditions (e.g. in the *maquilas*) also in domestically oriented sectors	√	
2. Promote social and tri-partite dialogue	√	√
3. Continuously involve civil society and key stakeholders in social policy issues	√	√
4. Support and provide technical assistance to the SME sector	√	√
5. Provide regional policy support, especially in regions where negative social effects are expected to be pronounced		√
6. Devote special attention to poverty and vulnerable groups		√
7. Ensure a match between educational skills and development needs		√

1. Include a Sustainable Development chapter in the AA, addressing social and environmental issues related to the trade-part of the AA

In a specific sustainable development chapter, the interlinkages and indivisibility of the economic, social and environmental pillar can be highlighted. In the social field, issues that can be flagged or highlighted may include:

- **Help enforce international labour standards**. Commitments of both parties to effective implementation and enforcement of core ILO labour standards and issues flagged in ILO DWCPs (e.g. with respect to abolition of child labour, equal work opportunities for women and combating discrimination against indigenous peoples and other vulnerable groups in the workplace – ILO Convention 169 is particularly pertinent to this issue). A positive example is the labour chapter that was included in CAFTA setting minimum labour standards for Central American firms before they export to the US. By the same token, EU firms importing from the region should ensure the imported products are produced in accordance with ILO DWA standards, as well as other ILO declarations such as those identified as 'priority conventions' by the ILO Governing Body (1993 decision), although taking a more in-depth approach than in CAFTA by including issues on gender quality and discrimination.[21]
- **SMEs** may not have the capacity and facilities to adhere to these and therefore technical assistance will be required from the EU or Central American governments.

[21] Red Regional de Monitoreo de DR-CAFTA (2008), *II Informe Regional sobre los Impactos del DR-CAFTA en Centroamerica y la Republica Dominicana.*

- Also, as low wages and lax labour regulations can serve as a comparative advantage for Central American countries. Increased competitive pressure might include the risk of local firms (whether or not foreign-owned) using these factors in seeking to maintain their local competitive positions in a 'race to the bottom'. **Monitoring and evaluation systems** (such as those recommended in the DR-CAFTA White Paper, e.g. employer sanctions, the provision of direct support to trade unions, and urging governments to create laws to regulate employment subcontracting) should be implemented by the governments to avoid this as low cost labour has been proven not to be a sustainable way to encourage development.
- On the flipside, as investment increases from the EU, this could **encourage the improvement of labour standards**. Vulnerable groups such as women, children and indigenous populations may benefit from better labour conditions provided by foreign firms which will improve their working situation. EU firms investing in the region should ensure they adhere to the ILO DWA and encourage national governments in Central America should stimulate the incorporation of these standards into local practices.
- A specific area of attention relates to **working conditions in the *maquilas***. Increased competition from Asian countries and a reduction in recent years in the added value growth of the *maquilas* could have consequences for employees in this sector. The AA should include a mechanism to mitigate the negative effects of trade liberalisation on vulnerable groups. This should include working closely with the ILO on Decent Work Country Programmes (DWCPs) which recognise the importance of tripartism, social dialogue and decent work standards as central to assistance to developing countries. Also in domestically oriented sectors, working conditions should be addressed. In addition, all companies on the territory should be made to comply with these standards thus avoiding the expansion of export processing zones (EPZs) as a means to avoid the enforcement of decent labour conditions.

2. Promote social and tri-partite dialogue

In line with the previous recommendation on labour issues, social dialogue between trade unions, employers and labour ministries could be improved with the help of EU funds and technical assistance. The suggestion by Central American society to provide two mechanisms for social dialogue; one for social organisations and one for environmental organisations is a useful tool in stimulating this dialogue and should therefore be implemented. Building upon and searching for synergies with existing initiatives and networks should be sought, e.g. with regional efforts deployed by the ILO. Social dialogue needs to be aimed specifically at inclusiveness of employment opportunities, facilitation of reallocation of labour and formalisation efforts of informal workers. Especially on the side of trade unions in Central America, some capacity building for effective social dialogue can be required.

3. Continuously involve civil society and key stakeholders in social policy issues

In designing and implementing social and labour policies, it is crucial to continuously involve civil society and the private sector (e.g. by way of a Trade and Sustainable Development Forum on an annual or bi-annual basis), and in particular vulnerable groups such as indigenous populations. This is important in order to make policies truly balanced and for the benefit of society at large. It also helps making policy measures legitimate. Existing forums, networks and mechanisms both at regional and national level should be

used and were required be established. These mechanisms can then also be used e.g. to provide incentives to create more public-private partnerships.

4. Support and provide technical assistance to the SME sector

The SME sector is likely to be affected by ongoing economic liberalisation and structural reform of the economy in an increasingly competitive environment as a result of the AA (and of globalisation processes in general). As the SME sector forms a significant part of employment, formal but also informal, and livelihood in Central America (especially the economically less-advanced countries in the region), continuous attention to SMEs and especially the vulnerable groups therein should be given throughout the various policy initiatives. Measures could include efforts to increase education levels and provision of vocational training (e.g. on entrepreneurship and administration, or specifically in content-based knowledge) and retraining to facilitate labour displacement across sectors. Export promotion programmes (e.g. basic knowledge of important export markets, as well as of legal and administrative procedures and meeting SPS required for export) for SMEs could also prove to be specifically beneficial.[22]

5. Provide regional policy efforts where needed

The AA is expected to have uneven effects (both positive and negative) in certain sectors. If in addition production and employment in such sectors are concentrated in certain EU regions or Central American countries, it can be advisable to develop a regional strategy to deal with such transformation processes e.g. through structural funds. For example in the EU some effort might be advisable to facilitate reallocation of labour away from the FVN sector in southern Europe and stimulate refocusing towards higher value-added agricultural products. In Central America, some (temporary) migration patterns can be expected (e.g. for FVN production in Costa Rica and Panama), requiring targeted facilitating programs and policy efforts.

6. Devote special attention to poverty and vulnerable groups

Overall, our poverty analysis indicates slightly declining poverty levels in the Central American region. At the disaggregate level however, certain specific groups may be affected by sectoral decline or specific price and income effects. Throughout various policy initiatives, monitoring and enhancing the pro-poor and pro-gender equality effects should be ensured.[23] As mentioned before, technical assistance in various fields and at sector-level could be aimed at specific vulnerable groups, e.g. export promotion for SMEs, entrepreneurship for female groups, environmental services in forest areas for indigenous populations and SPS standards in small-subsistence farmer areas.

7. Ensure a match between educational skills and development needs

Domestic educational programmes should be acutely aware of the need to increase the skills levels of the populations in Central America as a whole, since this will make the workers more flexible in changing jobs overall.[24] However, as is witnessed in many other developing countries, the educational and skills trainings should focus not only on

[22] CC-SICA (2009) highlights the importance of monitoring this technical assistance to SMEs to assist with implementation.

[23] See for example the suggestion by CC-SICA to include a Social Cohesion Fund in the AA: CC-SICA (2009), *Propuesta estrategica.*

[24] CC-SICA (2009) highlights the importance of encouraging non-traditional education in order to stimulate awarenees on sustainable issues.

academic development, but also on the skills needs coming from the developing societies. For example, if engineers and technicians are direly needed, a strong focus on economics and business alone would not suffice.

8.2.3 Policy recommendations related to the environmental pillar

As with the social pillar, many of the environmental effects identified closely related to economically-induced transformation processes as a result of the trade part of the AA. Environmental externalities should be seen in that context and specifically included in the overall policy dimension. Environmental policies will mainly relate to or stem from changing demand for land and land use, as well as the issues of deforestation and institutional capacity for monitoring and enforcing environmental standards.

Table 8.3 Main environmental policy measures

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
1. Include a Sustainable Development chapter in the AA, including related support, addressing social and environmental issues related to the trade-part of the AA. Environmental issues may include: a. Multilateral environmental agreements (MEAs) b. Regional approaches c. Impact monitoring mechanisms d. Environmental standards e. Sector-specific issues (e.g. on forests, fishery, biofuels, organic farming, etc.)	√	
2. Create incentives for greener production, including environmental services		√
3. Enhance dissemination of innovative technologies		√
4. Create and improve monitoring mechanisms & ex-post evaluations		√
5. Continuously involve civil society and key stakeholders in environmental policy issues and conservation efforts	√	√
6. Provide regional policy support, especially in regions where negative environmental effects are expected to be pronounced		√
7. Strengthen institutional capacity for Central American environmental agencies and policy-making	√	√
8. Address deforestation and biodiversity loss	√	√

1. Include a Sustainable Development chapter in the AA, addressing environmental issues related to the trade-part of the AA

As highlighted under the social policy recommendations, the interlinkages between the economic, social and environmental pillars should be the starting point of such an SD chapter. In the environmental field, issues that can be addressed may include:

- Commitment to signing and enforcing multilateral and international environmental agreement (MEAs) in order to combat climate change, preserve biodiversity and ecosystems (Convention on International Trade in Endangered Species of Wild Flora and Fauna - CITES), as well as the identification and tackling of bottlenecks to effective implementation.
- Promote regional (cross-border) approaches in Central America and cooperation and compatibility of national and regional policies and strategies.
- Attention for improved design and implementation of specific monitoring mechanisms to strengthen sustainable natural resource management (e.g. addressing illegal logging, trade in wildlife, unsustainable fishing practices).
- Ensure the monitoring and evaluation of environmental standards, particularly in sectors which have a tendency to forego this for the sake of exploiting their comparative advantage in cheap production (e.g. sustainability of fishing and other agricultural activities with large potential environmental impacts).
- Make sector-specific regulations (certification systems), e.g. in relation to endangered wood species and the (eco-) tourism sector which can have a profound effect on the environment. It is also recommended to include sector-specific environmental considerations and provisions for those areas where environmental impacts are predicted to be significant, both in the SD chapter as well as in other relevant chapters.
- Cooperate to encourage the production and use of biofuels in a sustainable manner, thereby decreasing fossil fuel reliance in both regions.

2. Create incentives for greener production, including environmental services

Projected increases in production and growth are expected to have some negative environmental impacts as identified in the TSIA. A positive approach to counterbalance and mitigating such effects is to create incentives for environmental friendly products and services.[25] These should be based on individual country situations rather than a 'one size fits all' approach.[26] This fits very well in the trend towards greener production, increased attention for health and sustainable consumption that is observed in both the EU as well as Central America. Positive policy measures could for example link a fast-track speed of sector liberalisation or other benefits to the level of environmental progress in those sectors compared to the starting point of reforms and initiatives (e.g. in environmental goods and services between the EU and Central America). Such measures should stimulate eco-industries as well as for example organic farming, which is starting to take off in Central America. Another way to promote greener production is to include environmental standards in public procurement contracts.

Given that land use for livestock is expected to decrease in Central America, there may be an opportunity to improve farming practices and thereby animal welfare throughout the production chain. The current European proposal to include bilateral cooperation on this issue should therefore be encouraged. Other tools which could potentially be considered include mentioning animal welfare in the SPS chapter, as was done in the EU-Canada and

[25] As suggested by the Union Internacional la Conservación Naturaleza (2009), *Pago de Servicios Ambientales* and CC-SICA (2009), *Propuesta estrategica.*.

[26] Suggestions for environmental programmes to be implemented are included in the Centro Humboldt (2009) study on Nicaragua. These include a climate change programme, protection of biodiversity, water resources and organic and sustainable farming.

EU-Chile agreements and thereby stimulating EU-funded training for veterinarians and abattoir workers and developing public awareness on these issues; and implementing differential tariff treatment according to levels of animal welfare, as in the case of encouraging good environmental practices.

3. Enhance dissemination of innovative technologies

Cleaner environmental technologies are available in the EU and the dissemination of these to Central America should be stimulated. To facilitate these, action can be undertaken in both regions. As in point 2, the EU could provide incentives to businesses for the use of more environmentally-friendly engines, such as increased market access to the EU and/or environmental tax incentives. EU firms investing in Central America should ensure adherence to environmental policies and guidelines by their own fixtures as well as others in their supply chain. In Central America, financial assistance by way of temporary funds could be provided by the government in order to encourage the transition to these cleaner technologies. The disbursement of these funds should be conditional on using environmentally-friendly methods and equipment thereby both creating incentives to commit to these practices *and* raising awareness of environmental issues in industry.

4. Create and improve monitoring mechanisms & ex-post evaluations

The successful implementation of environmental regulations and standards is partly dependent on a robust monitoring and evaluation system. While early and systematic monitoring of environmental developments assists in the identification of certain impacts (i.e. on deforestation, biodiversity and ecosystems and GHG emissions, etc) and allows the creation of suitable preventive measures, a thorough and import ex-post evaluation mechanism serves to assess the success rate and appropriateness of such measures and allows recommendations to be made on improving these. We also recommend the inclusion of a reference to voluntary Environmental Management Systems. In Central America in particular, this is likely to be challenging given the weak institutional capacity in the region and the lack of mandates for national, regional and local entities to enforce environmental standards. A key target then should be capacity building for such institutions.

5. Continuously involve civil society and key stakeholders in environmental policy issues and conservation efforts

In designing and implementing environmental policy and conservation efforts, civil society and the private sector (including universities and research institutes) should be continuously involved. This is important in order to make use of existing conservation efforts and local knowledge e.g. present in local (indigenous) communities and to make policy measures legitimate and broadly supported. Existing forums, networks and mechanisms both at regional and national level should be used and were required be established.

6. Provide regional policy efforts where needed

The AA is expected to have uneven effects (both positive and negative) in certain regions. In Central America specific policy efforts and associated funding is required in those regions where negative environmental effects are pronounced. This might for example be

the case in the regions where the FVN sector is expected to expand mostly, which are also the areas where most forests and biodiversity exists.

7. Strengthen institutional capacity in Central American environmental agencies and policy-making

As mentioned above, the capacity of Central American institutions in general, and environmental agencies in particular, must be improved in order to allow the successful implementation of policies and mechanisms to mitigate the negative effects of increased trade and investment flows in the region. This could be provided by Central American governments or the EU and should also seek to provide technical assistance in conservation efforts. This last issue is particularly relevant in this region with a high indigenous population who is heavily reliant on forests for their habitat and livelihood.

8. Address deforestation and biodiversity loss

The monitoring of deforestation is difficult to maintain given limited information and methods for monitoring land use change. These methods should be improved to ensure the effective implementation of natural resource legislation by way of a joint monitoring programme between the two regions. This would involve the use of satellite imagery and GIS mapping, which can be used to relate the requirements of formal land use and development plans to actual land cover within any country. This monitoring mechanism can thereby serve to trace deforestation trends and create mitigation measures to prevent this at an early stage. The FLEGT/VPA initiative should also be included in the AA to prevent illegal logging. In addition to this and similar initiatives with a positive environmental impact, trade and investments should be promoted in environmental services and assistance should be provided in encouraging knowledge dissemination and on forestry-related issues such as forest management and sustainable forest products. Furthermore, from the EU side a strict monitoring and enforcement policy on imports of timber from Central America should be maintained, scrutinising the origins of imported timber to combat illegal logging. Certification and monitoring thereof is one approach to take, in combination with a regional agreement on logging in Central America.

One of the suggestions for further research relating to this point is to continue improving environmental impact assessment methodologies. This would include collecting more precise data on the specific regions / areas within relevant countries where predicted land use changes are most likely to occur and indentifying specific and targeted (regional or local) measures to avoid additional deforestation and biodiversity loss.

8.3 Sector-specific policy recommendations

In addition to the horizontal policy recommendation given for the economic, social and environmental pillars above, some complementary sector-specific policy recommendations are summarised below, based on the in-depth analysis performed in this TSIA for selected sectors and horizontal issues.

Table 8.4 Policy recommendations: Fruits, vegetable and nuts

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
European Union		
Depending on the local situation, technological advancement can be stimulated in the EU in order to improve efficiency and competitiveness.	√	
Specific (technical) occupational resettlement for unskilled labour force requiring reallocation to other sectors.		√
Improved environmental monitoring and mitigation measures to prevent the risk from entry of alien species, of disposal of packaging materials harmful to human health and increased pressure on marine pollution.		√
Central America		
Capacity building should be provided in the following areas: export promotion (knowledge of the EU market), efficient and sustainable production methods and technologies, and meeting SPS standards.		√
Opportunities should be improved for SMEs to access credit (and technology) to improve access to export markets.	√	
Investment in ports, roads and transportation is crucial for improving growth.		√
Regional integration and regulatory convergence between the Central American countries in e.g. technical standards, SPS measures and labelling requirements can facilitate efficiency and growth of the sector on a regional level considerably and will stimulate further investment in e.g. infrastructure.		√
Measures are needed to monitor and mitigate potential negative environmental effects on land use and on indigenous peoples' territories. This implies the need to collect more precise data for the specific regions / areas where predicted land use changes are most likely to occur in order to specify targeted measure to avoid additional negative effects on e.g. deforestation and biodiversity loss.	√	
The AA can provide incentive structures to improve the investment in and use of clean technologies and green production processes as well as robust social standards in agricultural production of FVN. Similarly, organic production can be stimulated.	√	

Table 8.5 Policy recommendations: Forestry

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
European Union		
Inclusion of sustainable development chapter and of specific environmental issues in the sector chapter. e.g. related to the furniture industry, tourism.	√	
Develop monitoring and evaluation system and conduct ex-post assessments of the implementation and impacts of the FTA and AA to examine environmental issues.	√	
Closer cooperation is needed between EU and Central American countries on the development of sustainable biofuel policies and bio-energy.		√

Include FLEGT/VPA as part of the AA and flag the VPA in the FTA SD chapter.	√	
Promote certification and due diligence programs and assist CA countries with compliance.		√
Explore the role that trade and investments in forest based environmental services can play.	√	
Provide assistance and encourage technology and knowledge dissemination on forestry management and sustainable forest products and biofuels production.		√
Central America		
Explore the role that trade and investments in forest based environmental services can play..Stimulate involvement of and cooperation with local populations and communities to develop and exploit further opportunities for forestry-based environmental services and NWFP.	√	√
Promotion of incentives and conditions for sustainable forest management and better enforcement of existing legislation relevant for the protection of forests with assistance and technical expertise from the EU.		√
It is necessary to develop effective mechanisms to monitor compliance with regulations of both local and international operators, aimed at protecting the environment and fair conditions and labour practices.		√
Active labour and other social measures in regions most affected by unemployment increases such as re-skilling of labour, temporary safety nets, and promoting new employment sources in the affected countries and regions.		√

Table 8.6 Policy recommendations: Textiles and clothing

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
European Union		
Inclusion in the AA of a Sustainable Development chapter and continuation of the initiatives under the GSP+ system in the area of labour and social policy and decent work issues.	√	
Encourage mainstreaming of trade policy and assistance programmes to facilitate addressing of environmental and social (adjustment) issues in the context of the T&C sector and wider economies of CA.	√	
Provide information, education and training to EU T&C companies and especially SMEs in understanding the agreement and its requirements, as well as Central American markets.		√
Central America		
Address existing NTMs, e.g. by simplifying labelling requirements, improving transparency and efficiency of customs procedures, and establishing a strong IPR protection regime.		√
Work towards the alignment of technical regulations and standards with international practices e.g. by strengthening border control and cooperation with EU authorities.		√

Further promote the enforcement of labour regulations as a means to attract EU investment in maquila plants and access critical EU markets.	√	
Ensure that labour laws must also protect essential workers rights such as association and trade unions.		√
Promote internationally accepted and recognised certification for producers and their subcontractors and support the adoption of CSR best practices.		√
Improvement of infrastructure and services (education, health, sanitation, roads, ports, communications, etc) is a priority, foreseeing the increase of population in urban and neighbouring areas.		√
Develop flexible labour markets through re-skilling or vocational training programs in order to help workers moving from sectors that will decrease labour demand to new industries.		√
Promotion of cluster/integration programs. A goal for the region should be the integration of the domestic industries and the *maquila* plants in order to reinforce the local market and increase the national production. In addition, special programmes to promote joint investment initiatives and cooperation between EU and Central American business operators should be considered.		√

Table 8.7 Policy recommendations: Electronics

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
European Union		
Governments could help stimulate innovation and productivity in the region by investing in education and R&D, promoting public-private partnership and possibly by FDI attraction.		√
Governments may support the unemployed by providing education for these people to get them employed in other sectors, or use existing measures like Structural Funds.		√
Given the relatively strict environmental standards in the EU, it is important to monitor non-compliant imported electronics entering from Central America.	√	
Energy efficiency could be further supporter by promoting stimulus packages to invest in smart technology, introducing targeted regulation, and sharing of best practices.		√
Central America		
The AA should allow for similar policies and provide measures that support the moves into new comparative advantages in high-tech.	√	
Both public and private funds and initiatives to improve the education sectors in the different countries in the region should be stimulated.		√
Linkages between the sector and the rest of the economy should be stimulated, preferably with the involvement of SMEs.		√
To stimulate gender equality in the sector, affirmative action, both in tertiary education and in hiring policies, could be recommended.		√
TA should be provided to exporters in the region for raising awareness on		√

EU regulations on electronic products and for compliance with these regulations.		
The AA should allow for similar policies and provide measures that support the moves into new comparative advantages in high-tech.	√	

Table 8.8 Policy recommendations: Maritime transportation services

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
European Union		
Incentives to further gradually liberalise the whole door-to-door transport services chain should be implemented.		√
The AA could contribute to creating incentives to reduce emissions from seaborne trade on this route, e.g. by promoting the use of greener technologies and better enforcement of standards.	√	
Improved Flag State control between Central America and the EU could reduce the risk for sea polluting incidents.		√
Central America		
Stimulate port development, including auxiliary, transport and logistic services, and infrastructural improvement (door-to-door) in order that economic benefits in this sector can materialise.		√
The use of EU expertise and examples of EU best practices, can be used to map existing bottlenecks and to identify the main factors contributing to the presently high transport costs in the Central American region thus contributing to making the system significantly more efficient.		√
A regional and EU-Central American concerted approach is needed for updating the Plan Puebla Panama, specifically aiming at the intraregional facilitation of short sea shipping (SSS) potential, as well as upgraded outlets from agrarian production centres to ports.		√
Port infrastructure should be upgraded as well as maritime environmental regulation and protection.		√
Port training centres may well be involved in Central American educational programmes aimed at efficiency enhancement, based on exchanges and fellowships as already practiced with Central America's other partners.		√
Labour standards and social dialogue should be strengthened in the region to ensure fairness, transparency and defence mechanisms.		√
Coastal protection schemes should be included in flanking programmes resulting from increased technical cooperation between the two regions.		√
Strategies to combat crime are needed in the context of cost cutting strategies as some port centres (e.g. San Salvador), the cost of delinquency has risen to dimensions of non-tariff measures. Strategies could include more trade facilitation to improve customs procedures and encourage transparency		√
Environmental standards could be included in the overall regulation system, inspections, intensive controls and paperwork, thus amounting to a win-win outcome of improved environmental conditions and reduced economic		√

barriers		
National ministries for environmental affairs would have to play a much more prominent role in the articulation and implementation of guidelines together with their regional as well as transatlantic counterparts, if the further introduction of international norms and standards is to have any effect.		√
In order to reap the benefits of the AA, Central America needs to focus on upgrading its services. One vital way of achieving this is by the provision of on-the-job training in Central American firms in order to allow this upgrading to occur.		√

Table 8.9 Policy recommendations: Investment Conditions

Policy measure	Potential to address	
	Within trade-part AA	Outside trade-part AA
European Union		
Promotion of among EU businesses of investment opportunities in Central America.		√
Research should be done into the opportunities for EU firms to invest in natural resources and raw materials in Central America.		√
Central America		
The region must remain committed to reducing NTMs such as SPS measures, customs procedures and the lack of a conflict mechanism on investment issues.		√
Technical assistance and capacity-building for local and national governments and SMEs will be needed.		√
In tourism, municipalities and regional governments must be supported in the development of policies that will encourage the creation of local skills in the sector.		√
There should be an informative campaign targeting businesses and chambers of commerce on exporting to the EU.		√
Opportunities in new/niche sectors such as environmental goods and services, eco-tourism and fair trade initiatives should be promoted as commercially interesting to private EU investors.		√
Thorough environmental impact assessments must be conducted by national governments or investment promotion agencies in order to predict and make plans to mitigate the potentially harmful effects of increased industry through investment.		√
The investment climate should be improved by reducing foreign ownership restrictions, competition policy and strengthening of market forces (e.g. phasing-out state aid) and strategic deregulation.	√	√