



The Impact of the Central America Free Trade Agreement on Agriculture and the Rural Sector in Five Central American Countries

Executive Summary



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382.972 RUTA Project

P969-p The Impact of the Central America Free Trade Agreement
on Agriculture and the Rural Sector in Five Central
American Countries Executive Summary / Hans G.P.
Jansen; Sam Morley y Máximo Torero. - 1. ed. - San José, C.R. :
Proyecto RUTA; IFPRI, 2007.
32 p. ; 28 x 22 cm. (RUTA Publication Series. Working
Paper ; No. 26)

ISBN 978-9968-866-57-6

1. Free Trade. 2.Comercial Agreements. 3.Agriculture.
4.Rural Areas. 5.Central America. I. Jansen, Hans G.P. II.Morley,
Sam. III. Torero, Máximo.

Working paper prepared by:
Hans G.P. Jansen, Sam Morley, Máximo Torero, IFPRI

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Printed in: Costa Rica

October 2007

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Glossary

CAFTA	Central America Free Trade Agreement
CBI	Caribbean Basin Initiative
CBTPA	Caribbean Basin Trade Partnership Act
CGE	Computable General Equilibrium
ECLAC	Economic Commission for Latin America and the Caribbean
IADB	Interamerican Development Bank
IFPRI	International Food Policy Research Institute
LSMS	Living Standard Measurement Survey
RUTA	Regional Unit for Technical Assistance
USA	United States of America

Acknowledgements

This research has been possible thanks to the financial support of the World Bank, the Interamerican Development Bank (IADB), the Dutch Embassy in Nicaragua, the Central American Bank for Economic Integration (BCIE), the Regional Unit for Technical Assistance (RUTA), and the UK Department for International Development (DFID).

The authors would like to thank RUTA for its contribution to the dissemination of the results of the project throughout its execution, promoting its relevance for the region and stimulating wide interest in its findings.

Finally, we would also like to thank Patrizia Cocca for the editorial work, Valeria Piñeiro for text review, Miguel Gómez for valuable inputs, and Roxana Romero for graphic design.



1. Introduction

The International Food Policy and Research Institute (IFPRI), headquartered in Washington, D.C. and represented by an office in Central America based in RUTA, in San Jose, Costa Rica, and the Sub-regional Economic Commission for Central America (ECLAC) office based in Mexico, have been executing the Project on the Impact of the Central America Free Trade Agreement on Agriculture and the Rural Sector in Five Central American Countries (“the Project”).

The Project covers the five Central American countries (Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica), and it is expected that its outputs serve as a guide on the type of policies and complementary measures that must be taken for the countries to maximize the use of the new economic environment brought about by CAFTA and, at the same time, reduce possible negative impacts that could take place among the vulnerable groups of the rural areas in these countries.

The Project started with a qualitative analysis using economic sense to obtain criteria on courses and magnitudes of the effects of CAFTA on the welfare level of producers and consumers. However, the Project's main activities have approached a series of quantitative analyses, namely:

1. Analysis of CAFTA's impacts on macroeconomic indicators (economic growth, employment, imports, exports, etc.), sector behavior, income distribution and poverty, through simulations with national mathematical models such as Calculated General Equilibrium (CGE) models.
2. Analysis of five productive chains affected by CAFTA in each of the five countries, and which are relevant for the small producer, with emphasis on how the treaty will change competitiveness of each of these items and obstacles that hinder their competitiveness on imports or the use of new export opportunities. New opportunities that may arise for substitute import products that could face certain challenges, and for export items whose prospects could improve as a result of trade opening.
3. Calculation of economic rates of return of public investments that improve access to various types of infrastructure (roads, electricity, drinkable water and telephones) on the basis of a cost-benefit analysis, as an input for the design of complementary agendas.

The purpose of this report is to provide a summary of the qualitative analysis outputs, and synthesize key results of the three types of quantitative analyses mentioned above.

2. Qualitative analysis of the impact of CAFTA ¹

The qualitative analysis was carried out to assess the effect of CAFTA's effects on the wellbeing of producers and consumers. The following are the main conclusions:

Result 1: The impact of CAFTA's rules regarding tariff reduction and quotas for strategic (sensitive) products is small in the short and medium term.

The effects of tariff reduction are necessarily small because:

1. Average tariffs in Central America had been substantially reduced prior to CAFTA (see Table 1).
2. The tariff reduction process generated by CAFTA is gradual (it protects producers yet at the cost of denying consumers access to cheaper products from the United States market during the period of gradual reduction), see Table 2.
3. Most Central American households are net consumers of basic agricultural products that are sensitive.

Table 1. Average tariff levels before CAFTA (%)

	1990	1995	1997	1999
Costa Rica	16	11	10	3
El Salvador	16	10	10	6
Guatemala	16	12	11	8
Honduras	42	10	10	8
Nicaragua	8	11	7	11

**Table 2. Gradual tariff reduction (%) on sensitive commodities:
Example for Honduras**

	Pre-CAFTA	1st Year	5th year	10 th year	15th year	20th year
Yellow corn	45	45	45	30.2	0	0
White corn	45	45	45	45	45	45
Rice	45	45	45	45	25.2	0
Beans	15	14	10.3	5	0	0
Carne Bovina	15	12	0	0	0	0
Poultry	54.9	52	45.5	41.1	23	0
Dairy	12.1	11.8	11.6	11.3	5.5	0

¹ Based upon the following documents: (1) Morley, Sam. Trade liberalization under CAFTA framework: Analysis of the agreement with special reference to agriculture and smallholders in Central America. Working document No. 19, RUTA-IFPRI-DFID, San José, Costa Rica (www.ruta.org), 2007; (2) Jansen, Hans G. P.; Morley, Sam; Piñeiro, Valeria; Sánchez, Marco; and Torero, Máximo. The impact of the Central America Free Trade Agreement on the Central American textile maquila industry. IFPRI. Discussion Paper No. 720. Washington DC. 2007.

The effects of quotas are necessarily small because:

- For most sensitive products, the size of quotas is smaller than the imports prior to CAFTA.
- Wherever quotas are larger than imports prior to CAFTA (e.g. white corn for El Salvador and Guatemala), they are small compared to the national supply (<5%), except for rice in the case of Honduras.
- Safeguards are provided to most commodities subject to quotas.

However, these results with regard to tariff reduction and quotas do not do away with some concerns:

- Immediate income losses in certain sectors, even though small (max. 5%), are potentially significant for the poorest people, especially in the short term; examples include pig producers given that imports quotas for pork meat are relatively large.
- In the longer term, after the transition period provided by CAFTA, net producers of sensitive products (especially rice, pork and poultry) need to adjust to the new economic environment set by CAFTA; public interventions will be needed to assist low income households to face the adjustment costs and to take advantage of new opportunities.

Result 2: There are few export commodities for the increased access to the US market through quotas provide significant benefits

However, there are some exceptions:

1. Sugar: Quotas for Central American countries are almost doubled (yet they represent less than 1 % of total Central American production).
2. Beef: Additional quotas for Costa Rica and Nicaragua mean a 13 – 16% increase of current production levels.
3. Peanuts: Additional quota for Nicaragua.

CAFTA also consolidates the preferential access to the US market for textiles and apparel produced in Central America (see result 4).

Result 3: CAFTA establishes a gradual elimination of tariffs for many commodities produced in Central America with export potential to the US, thus increasing, in the medium and long term, their possibilities of penetrating the US market.

- Based upon the analysis of comparative advantage, a large number of products have strong potential to increase their export volumes to the US market: 136 products produced in Costa Rica (10.7% of total exports), 116 in El Salvador (6%), 181 in Guatemala (9%), 75 in Honduras (8%) and 82 in Nicaragua (35%).
- Under CAFTA, several of these products are given preferential access to the US market, thus increasing their export potential: 43 of these have a current export value of at least one million dollars per year (see Table 3).

Table 3. Competitive commodities under CAFTA's trade liberalization

SAC	Total exports (mill. US\$)	Excluded from CBI	Tariff category	Product
Costa Rica				
2031100	944	X	A	Pork meat
3034200	1123	X	G	Tuna
3052000	1606	X	G, A	Fish roes and liver
5111000	2224	X	G	Bovine semen
8045010	4361		A	Fresh mangos
8071900	62757		A	Other fruit
12071010	5963	X	G	Palm nuts
15111000	33566	X	G	Palm oil
16041300	6042	X	G,A	Sardines
17041000	2339		A	Chewing gum
19053000	14585	X	G	Sweet cookies
20097090	1188	X	nc	Concentrated apple juice
21069030	41695		Q	Preparations for the manufacture of beverages
Total	178393			
El Salvador				
3023900	1090	X	G,A	Fresh tuna
9023000	1285	X	A	Black tea
15179090	1117		A	Food preparations based on animal or vegetable oil
17019900	2597		Q	Saccharin
19021900	1659	X	A	Non-egg pasta
21039000	2882		Q	Sauce preparations
23099020	2114	X	Nc	Bird food
Total	12744			
Guatemala				
409000	1773		A	Honey
7020000	6078		A	Fresh tomatoes
7096010	1940		A	Pepper
10051000	2644	X	G	Corn seeds
11041200	2953		A	Oatmeal
12074010	4254	X	G	Sesame seeds
15179090	3872		A	Food preparations based on animal and vegetable oil
19021900	2412	X	A	Non-egg pasta
19041000	28919		A	Products based on roasted cereals
19059000	10547	X	A	Cookies, pastry and bread
21021090	1593		A	Yeasts
2208010	2142	X	G	Ethyl alcohol
Total	69127			
Honduras				
7082000	1267		G,A	Beans
7133200	7594		A	Red beans
15119010	1414	X	A	Palm oil
17049000	4438		G,A	Sugar confectionery
20055900	1319		A	Preserved beans
20094000	4366		A	Pineapple juice
20097010	4471	X	Nc	Concentrated apple juice
Total	24869			
Nicaragua				
1029000	15982		G	Bovine animals, live
2011000	4712		Q	Bovine carcasses
4063000	2964		Q	Processed cheese
12074010	1197	X	G	Sesame seeds
Total	24855			
Gran Total	309988			

Result 4: The largest immediate impact of CAFTA is on the Central American textile maquila industry, protecting more than 400,000 jobs.

CAFTA's consolidation and expansion of the already existing (but temporary) regulations regarding the maquila industry has a big impact because:

- In all countries (with the possible exception of Costa Rica), the textile industry has huge economic importance (see Table 4).
- With regard to rules of origin for inputs, CAFTA makes permanent the temporary advantages granted through CBI and CBTPA (without CAFTA, CBI and CBTPA would expire by 2008).
- Without CAFTA, the maquila would enter the North American market only if fabrics, cotton, thread and other related inputs are produced in US ("yarn forward rule").

Table 4. Economic importance of the textile maquila industry in Central America

	Exports (10 ⁶ \$)	% of total exports	Employment (‘000)	No. of enterprises
Guatemala	1717	37	140	500
Honduras	2462	60	130	200
El Salvador	1445	34	90	250
Nicaragua	754	46	65	70
Costa Rica	479	6	15	15
Total	6857	31	> 400	>1000

CAFTA makes permanent the benefits that the maquila industry is already enjoying under the CBI and CPTPA. Therefore, the impact of CAFTA on the sector might be overlooked unless an analysis is undertaken that assesses the situation with and without CAFTA. In this respect CAFTA provides a degree of security and sustainability to the maquila sector.

3. Quantitative analysis of the impact of CAFTA

Despite its interesting conclusions, the qualitative analysis presented in the previous section has two significant limitations:

- The qualitative analysis partial and static, i.e., it does not take into account the general equilibrium effects generated by free trade on the national economy, in particular the indirect effects on the exchange rate, household income, employment etc.
- The qualitative analysis is limited to the analysis of general changes in the economic environment brought by CAFTA but does not:
 - Provide information on barriers to the successful insertion of small producers into value chains with new potential.
 - Indicate which type of infrastructure investments could have the largest impact on the wellbeing of rural households, in particular those which produce commodities sensitive to CAFTA.

In order to overcome the above limitations and to provide inputs into the design of the complementary policy agendas of all five countries, the Project used the following approach:

- Simulation of the macroeconomic impact of CAFTA using recursive dynamic CGE models. The results for the labor market obtained from the simulations with the CGE models were then linked to the household surveys of each country, and a microsimulation methodology was used to assess the effect of CAFTA on poverty and income distribution (see section 3.1)².
- Analysis of twenty five productive chains (five in each country) of sensitive products and commodities with export potential, with a focus on identifying changes in comparative advantage as a result of CAFTA, and the bottlenecks that small producers face in inserting themselves into these value chains (see section 3.2).
- Calculation of returns to public investments aimed at improving access to infrastructure and public services in general and areas where sensitive commodities are produced in particular (see section 3.3).

² The studies in Honduras and El Salvador were carried out by Sam Morley, Eduardo Nakasone and Valeria Piñeiro (2007); the study in Nicaragua was done by Rob Vos and Marco Sánchez (2006); and the study in Costa Rica was done by Marco Sánchez (2007).

3.1 Macroeconomic and poverty impact of CAFTA³

CGE models were used to assess the macroeconomic and poverty impact of CAFTA, projecting the performance of the Central American economies over time with and without CAFTA. A microsimulation methodology then linked the results to household surveys in order to analyze the impact of CAFTA on poverty and income distribution:

- Baseline simulation: Analysis of economic performance and poverty trends without CAFTA.
- Tariff simulation: Analysis of the impact of tariff reductions.
- Quotas simulation: Analysis of the impact of increases in the quotas of sensitive products.
- Maquila simulation: CAFTA makes permanent (and expands) certain rules of origin regarding maquila inputs already enjoyed by the textile maquila under the CBTPA. This simulation compares economic performance and poverty trends with and without those rules.

Result 5: Although small, the impact of CAFTA's trade liberalization on economic growth is positive.

- Consistent with the qualitative analysis, the impact on economic growth of increased import quotas is almost zero (see Table 5).
- Also consistent with the qualitative analysis, the impact of tariff reduction on GDP growth is very small (less than 0.2% per year, see Table 5).

Result 6: The largest impact of CAFTA in the short and medium term is not trade liberalization, but rather the consolidation and expansion of the rules of origin for the textile maquila industry. With the exception of Costa Rica, these rules account for 80–90% of CAFTA's total effect on GDP growth.

- With the exception of Costa Rica, the consolidation and expansion of the rules of origin for maquila have a significant impact on GDP growth (up to 1.4% per year in the case of Honduras, see Table 5).

³ Based on the following documents: (1) Morley, Sam and Piñeiro, Valeria. The impact of CAFTA on employment, production and poverty in Honduras. International Food Policy Research institute (IFPRI), Washington DC and San José, Costa Rica. 63 p. February 2007; (2) Morley, Sam and Piñeiro, Valeria. The impact of CAFTA on poverty, distribution and growth in El Salvador. International Food Policy Research institute (IFPRI), 56 p., Washington DC, April 2007; (3) Sánchez, Marco V. Trade liberalization in DR-CAFTA: Effects on growth, poverty and inequality in Costa Rica. ECLAC, Social Development Unit, Studies and Perspectives Series N. 80. Mexico D.F. September 2007. 112 p. (4) Sánchez, Marco V. and Vos, Rob. DR-CAFTA: Panacea or misfortune for economic and social development of Nicaragua? ECLAC, Social Development Unit, Studies and Perspectives Series N. 57. Mexico D.F. October 2006 (5) Morley, and Piñeiro, Valeria. The impact of CAFTA on growth in four countries in Central America: Evidence from a CGE analysis. IFPRI, Washington DC. 2007.

Table 5. Impact of CAFTA on economic growth: Annual percentage change, compared to the base scenario without CAFTA

Type of simulation	Honduras	El Salvador	Nicaragua	Costa Rica
Tariffs	0.14	0.17	0	0.09
Maquila	1.4	0.4	0.6	0.01
Quotas	0	0	0.2	0

Result 7: The impact of CAFTA on poverty is positive, and mostly due to consolidation of employment of unskilled labor in the maquila industry.

The simulation results indicate that CAFTA does not increase poverty but rather leads to a slight poverty reduction:

- The positive poverty effect reflects the findings of Result # 6 with regard to economic growth: The poverty impact of quotas is almost zero, whereas the impact of tariff reductions is very small. However, the poverty effect of the consolidation and expansion of the rules for maquila is significant, especially in Honduras and El Salvador (see Table 6).
- The substantial reduction of poverty in Honduras and El Salvador comes from maintaining employment of unskilled labor in the maquila industry under CAFTA, compared to the scenario without CAFTA (and CBTPA elimination) when most maquilas would be forced to close down.

Based on the above, it becomes clear that CAFTA is not a panacea to address poverty in Central America: Although positive, its effect on poverty is relatively small.

Table 6. Impact of CAFTA on poverty rates: Absolute change (%) by the end of the simulation period, compared to the scenario without CAFTA

	Tipo de Simulación		
	Tariffs	Quotas	Maquila
Honduras (2020)			
- national	-1.1	0	-7.3
- rural	-1.0	0	-7.8
- urban	-1.1	0	-6.7
El Salvador (2020)			
- national	-2.1	0	-3.7
- rural	-2.5	0	-4.4
- urban	-1.8	0	-3.3
Nicaragua (2012)			
- national	+0.1	-0.3	-0.7
- rural	+0.1	-0.3	-0.9
- urban	0	0	-0.3
Costa Rica (2026)			
- national	-0.8	0	0
- rural	-0.6	0	0
- urban	-0.9	0	0

Result 8: The impact of tariff reductions under CAFTA on agricultural sector growth is very small, but positive in Honduras and El Salvador, and negative in Nicaragua and Costa Rica; the impact of increased quotas is significant and positive only in the case of Nicaragua.

- Tariff reductions have a very small impact on agricultural sector growth (see Table 7).
- In Nicaragua, the expansion of quotas for certain agricultural products in the US market increases the rate of sector growth at around 1% per year.

Table 7. Impact of CAFTA on agricultural sector growth: Annual percentage changes, compared to the scenario without CAFTA

Type of simulation	Honduras	El Salvador	Nicaragua	Costa Rica
Tariffs	0.11	0.17	-0.05	-0.01
Quotas	0	-	1.0	-

Result 9: There are two possible ways to increase the positive effects and reduce the negative effects of CAFTA on economic growth and poverty. The first is to change the structure of domestic and foreign demand, in favor of those sectors that make intensive use of unskilled labor (e.g. maquila and export-oriented agriculture). The second is to increase the rate of investment, injecting more capital into the economy. Simulations using the CGE models show a significant positive impact of increased foreign direct investment on growth, employment and poverty.

3.2 The impact of CAFTA on agricultural production chains of small farmers⁴

The purpose of this section is to improve the understanding of CAFTA's likely impact on agricultural production chains that are relevant for small farmers. The analysis seeks at facilitating decisions aimed at mitigating the negative effects of CAFTA on smallholders and promote their participation in new market opportunities emerging from CAFTA. A total of twenty five value chains (five in each country, see Table 8) were selected for analysis, according to the following main criteria:

- Imports and/or exports are affected by CAFTA
- The products is to a significant extent produced by smallholders

In addition, the following secondary criteria were used:

- Number of jobs created
- Extent to which the product is produced in poor areas
- Importance in domestic consumption, for import substitution products
- Extent to which the product is exported to the rest of the world but not to the United States, as an indication of comparative advantage in international markets
- Geographical concentration or dispersion of production (products with higher concentration were selected)
- Degree to which the product is considered sensitive (affects vulnerable groups or producer associations with strong bargaining power)

Table 8. Product selection

Type of product	Costa Rica	Nicaragua	El Salvador	Guatemala	Honduras
Import substitution	Chicken leg quarters	White corn	Sorghum	White corn	Beans
	Pork	Red beans	Pork	Yellow corn	Pork
	Milk powder	Pork	Beans	Potatoe	
	Palm oil				
Export	Chicken leg quarters	Carne bovina	Sweets based on cane sugar	Mango	Watermelon
	Dracaena marginata (ornamental plant)	Cheese	Processed fruits	Flowers	Beef
					Palm Oil

In each of the five countries the analysis began with a detailed review of the literature regarding agricultural market chains in each country, followed by collection of quantitative data on selected products using field-based surveys (an average of one hundred surveys per product).

One of the main conclusions of the literature reviews was that the number of available market chain studies relevant for the Project is very small in all countries. More specifically, few available

⁴ Based on Jansen, Hand G. P. and Torero, Máximo. The impact of CAFTA on agricultural value chains of smallholders in five Central American countries. 213 p. IFPRI-RUTA, San José, Costa Rica. 2007.

studies allow a quantitative identification of the different stages in the market chain, their value added and potential or existing bottlenecks.

The results of the analysis carried out by the Project based on the survey data are shown by country, focusing on bottlenecks and competitiveness of each market chain.

The term “bottleneck” refers to limitations and inefficiencies in the market chain that affect the performance of the chain, with a focus on bottlenecks encountered at the farm level. Spider charts were used to demonstrate the proportion of interviewed producers that identified a given problem as their main bottleneck.

To assess the competitiveness of each individual product, the domestic price (based on total production cost on small farms plus a profit margin, 10% or 20%, depending on the scenario), was compared to the import or export price (border price plus tariff, be it in Central America for import substitution products, or in the US for export products).

In the case of import substitution products that enjoy a certain level of tariff protection in Central America, the domestic price⁵ includes the applicable tariff (taking into account the reductions imposed by CAFTA). The import price is defined as the price in the world market plus import duties. The ratio between the import price and the domestic price provides an index of competitiveness of the product. An index greater than 1 indicates that the Central American product is competitive.

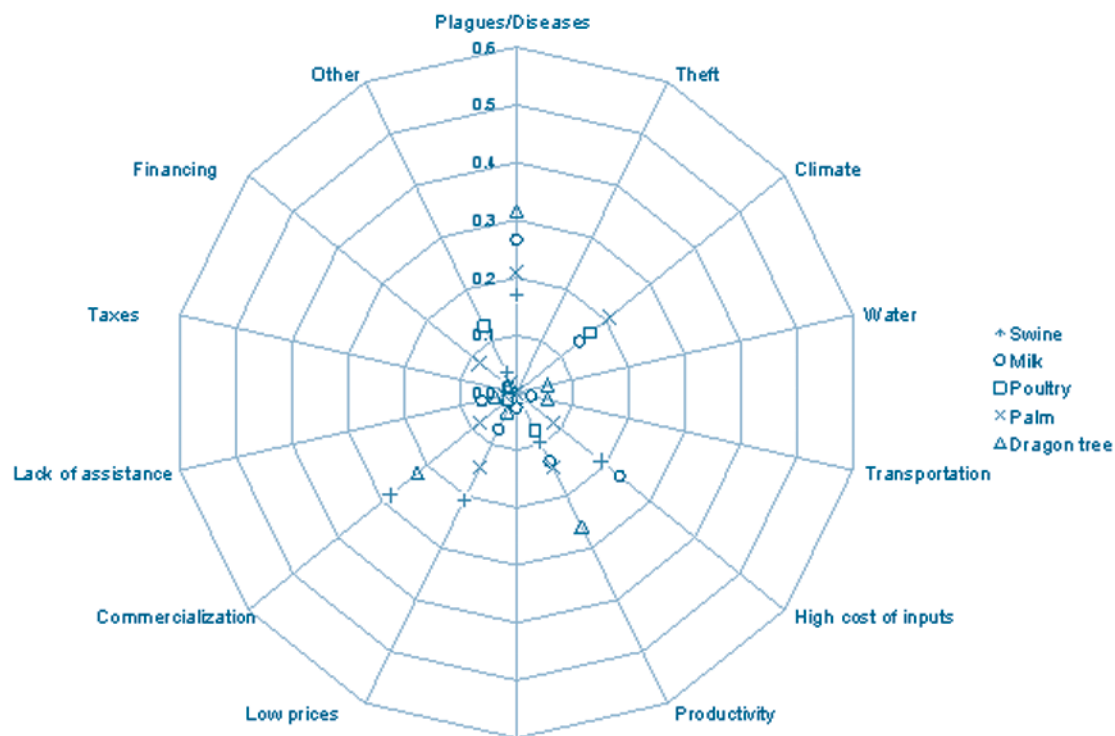
In the case of export products, the price of the Central American export supply in the US market (total cost in Central America plus applicable tariff at the US border) and the price in the world market (plus the same tariff) were compared. The ratio between the latter and the former is another index of competitiveness of the product. An index greater than 1 indicates that the Central American product is competitive.

5 The national price is defined as the cost of production plus the transaction costs (information, supervision, negotiation and transport).

3.2.1 Costa Rica

In Costa Rica, more than three quarters of the producers interviewed mentioned that they were facing difficulties. Small producers of *dracaena marginata* (see Fig. 1) mentioned as their most important bottlenecks pests and diseases (30% of interviewees), low productivity (26%), and commercialization problems (20%). Among small pig producers, difficulties in marketing are the most important limitation (50%), and climate and pest/disease related problems are the main bottleneck of palm producers. The main barriers for small milk producers include animal disease and the high cost of inputs, whereas disease and adverse climatic conditions are the main concern of poultry producers. According to the survey data, other problems such as technical assistance, transportation, labor and financing are relatively less important in Costa Rica.

Figure 1. Main bottlenecks of Costa Rican producers



Result 10: In Costa Rica, CAFTA improves the competitiveness of dracaena marginata and African palm, but worsens it in the case of milk, poultry and swine. However, the Costa Rican milk and poultry sectors seem to be competitive enough to withstand the new competition (see Table 9).

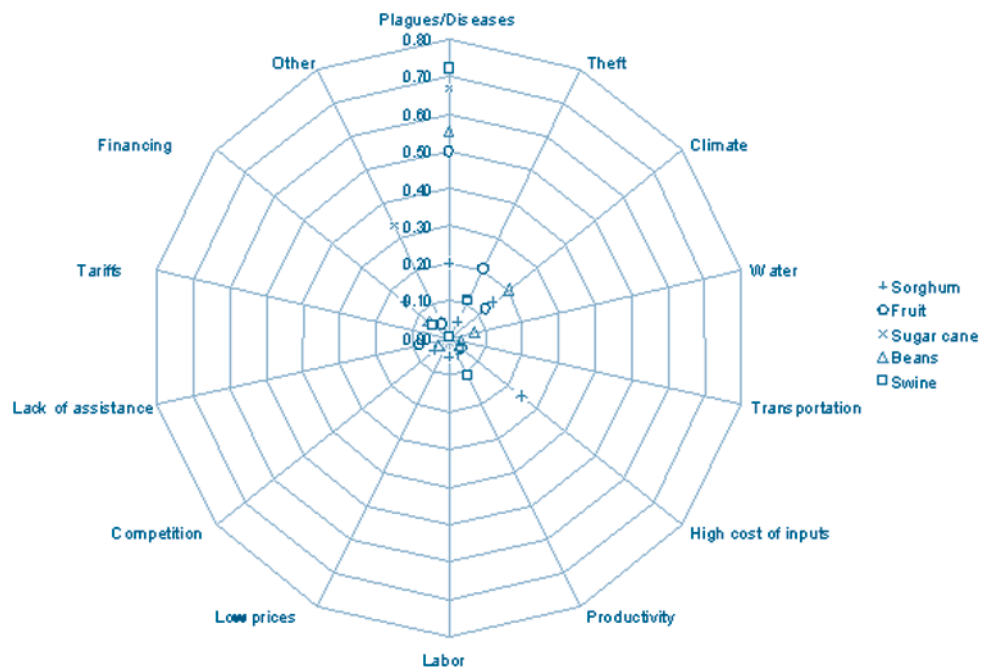
Table 9. Costa Rica: Competitiveness indexes before and after CAFTA

	Import substitutes			Export products	
	Milk	Chicken	Pork	Palm Oil	Dracaena M.
Total production cost	0.14	0.30	124.30	366.90	0.60
Production cost, 10% margin	0.15	0.33	136.73	403.59	0.66
Production cost, 20% margin	0.17	0.36	149.16	440.28	0.72
Pre-CAFTA tariff	0.15	0.15	0.40	0.15	0.40
Pre-CAFTA domestic price, 10% margin	0.18	0.38	191.42	464.13	0.92
Pre-CAFTA domestic price, 20% margin	0.19	0.41	208.82	506.32	1.01
International price	0.81	2.30	114.90	1918.00	0.75
International price plus tariff	0.93	2.65	160.86	2205.70	1.05
Pre-CAFTA competitiveness index, 10% margin	5.26	6.97	0.84	4.13	0.81
Pre-CAFTA competitiveness index, 20% margin	4.82	6.39	0.77	3.79	0.74
Post-CAFTA competitiveness index, 10% margin	4.57	6.06	0.60	4.75	1.14
Post-CAFTA competitiveness index, 20% margin	4.19	5.56	0.55	4.36	1.04

3.2.2 El Salvador

On average, and compared to Costa Rica, a significantly lower proportion of producers interviewed in El Salvador (between 18 and 61%) indicated that they were having problems. Pests and diseases are the most serious bottleneck in the production of beans and fruits (Figure 2), mentioned by 25% and 30% of producers respectively. Animal disease is the main bottleneck in smallholder pig production (30%), whereas pests and diseases are the main bottleneck for sugar cane producers (just under 20%). Finally, pests and lack of financing (inadequate access to credit, high cost of inputs) are the main bottlenecks mentioned by sorghum producers.

Figure 2. Main bottlenecks of Salvadoran producers



Result 11: Sorghum production by small farmers in El Salvador does not remain competitive under CAFTA's rules. On the other hand, small producers of sweets based on cane sugar, which had a 150% tariff in the US market, become competitive under CAFTA. Small producers of beans and pigs are competitive enough to succeed also under CAFTA's rules (see Table 10).

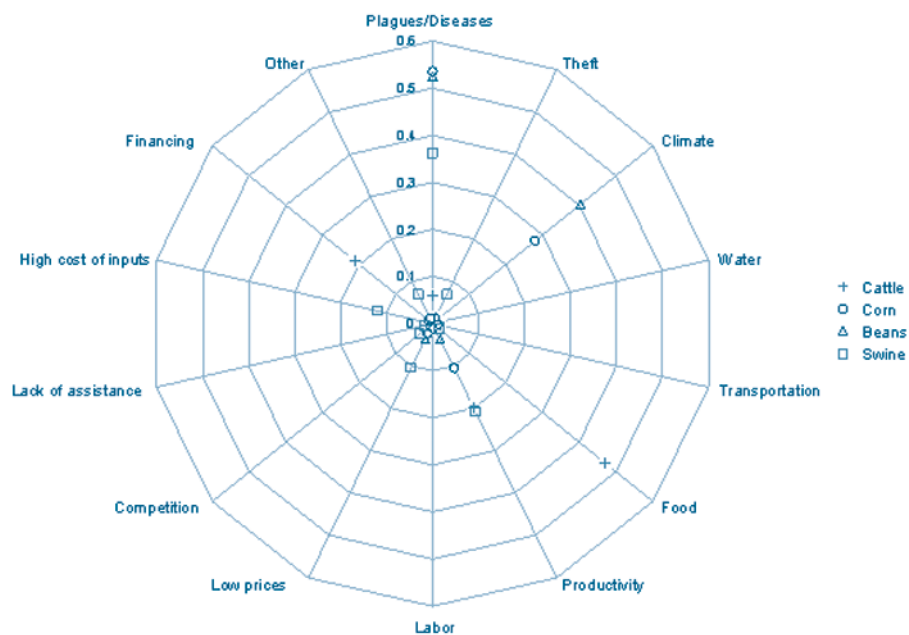
Table 10. El Salvador: Competitiveness indexes before and after CAFTA

	Import substitutes			Export products	
	Bean	Sorghum	Pork	Processed fruits	Sweets based on cane sugar
Total production cost	136.70	100.20	32.30	43.60	275.60
Production cost, 10% margin	150.37	110.22	35.53	47.96	303.16
Production cost, 20% margin	164.04	120.24	38.76	52.32	330.72
Pre-CAFTA tariff	0.15	0.15	0.40	0.15	1.50
Pre-CAFTA domestic price, 10% margin	172.93	126.75	49.74	55.15	757.90
Pre-CAFTA domestic price, 20% margin	188.65	138.28	54.26	60.17	826.80
International price	683.70	127.00	114.90	770.50	368.90
International price plus tariff	786.26	146.05	160.86	886.08	922.25
Pre-CAFTA competitiveness index, 10% margin	4.55	1.15	3.23	13.97	0.49
Pre-CAFTA competitiveness index, 20% margin	4.17	1.06	2.96	12.81	0.45
Post-CAFTA competitiveness index, 10% margin	3.95	1.00	2.31	16.07	1.22
Post-CAFTA competitiveness index, 20% margin	3.62	0.92	2.12	14.73	1.12

3.2.3 Nicaragua

The quantitative analysis of market chains included cattle, pigs, beans and corn. On average, a high proportion (between 72% and 87%) of producers reported problems. Pests, diseases and adverse climatic conditions seem to be the most serious problems of basic grain producers (Figure 3), as pointed out by 40% of corn and beans producers, as well as by a significant proportion of pig farmers. The main problems of beef cattle farmers are linked to cattle feed (30%), financing (15%) and low productivity (14%). The latter is also a problem for pig producers.

Figure 3. Main bottlenecks of Nicaraguan producers



Result 12: CAFTA does not affect significantly the competitiveness of small farmers producing beef, pork, beans and corn. Under CAFTA, bean and pork farmers remain competitive, and beef cattle farmers become even more competitive, whereas corn producers become even less competitive (see Table 11).

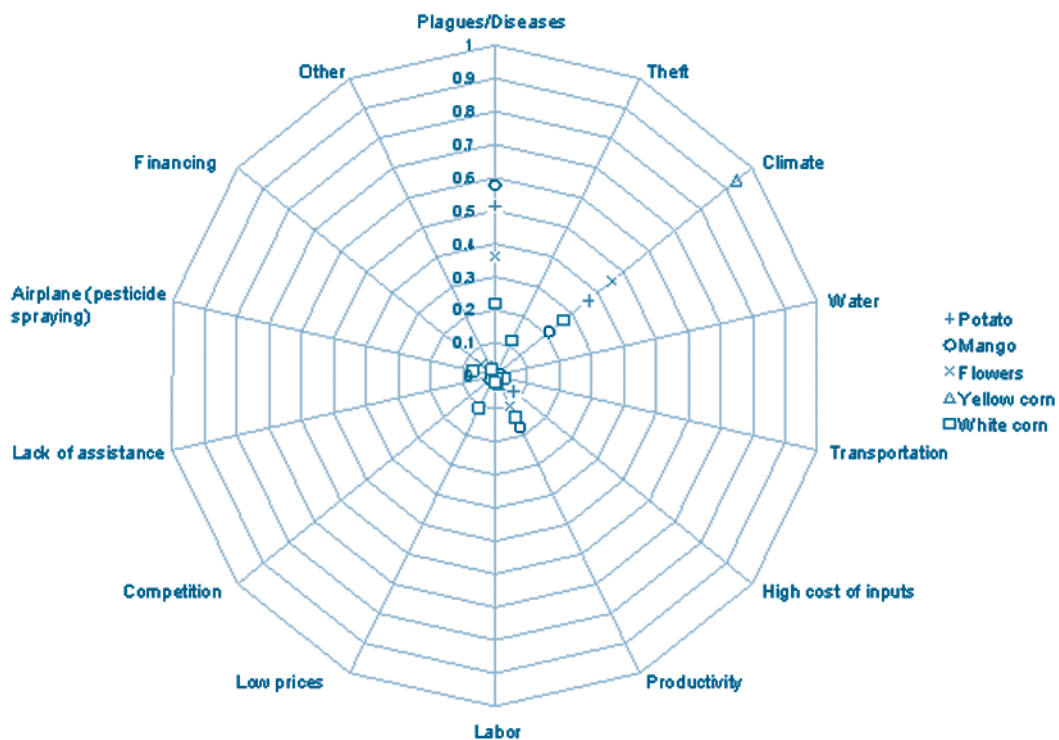
Table 11. Nicaragua: Competitiveness index before and after CAFTA

	Import substitutes			Export products
	Corn	Beans	Pork	Beef
Total production cost	270.70	408.70	37.90	86.50
Production cost, 10% margin	297.77	449.57	41.69	95.15
Production cost, 20% margin	324.84	490.44	45.48	103.80
Pre-CAFTA tariff	0.10	0.10	0.10	0.30
Pre-CAFTA domestic price, 10% margin	327.55	494.53	45.86	123.70
Pre-CAFTA domestic price, 20% margin	357.32	539.48	50.03	134.94
International price	134.90	683.70	114.90	418.20
International price plus tariff	148.39	752.07	126.39	542.66
Pre-CAFTA competitiveness index, 10% margin	0.45	1.52	2.76	3.38
Pre-CAFTA competitiveness index, 20% margin	0.42	1.39	2.53	3.10
Post-CAFTA competitiveness index, 10% margin	0.41	1.38	2.51	4.40
Post-CAFTA competitiveness index, 20% margin	0.38	1.27	2.30	4.03

3.2.4 Guatemala

As in Nicaragua, a high proportion of farmers reported having difficulties: “nearly 100% of producers of white corn, potato and flowers, 78% of yellow corn producers, and 70% of mango producers. Climate factors affect two-thirds of yellow corn producers, yet they affect less than 30% of white corn producers. Pests and diseases pose a serious problem to white corn but not to yellow corn; yet they are the most important bottleneck faced by small flower producers, together with climatic factors. Nearly 60% of mango producers pointed to pests and diseases as their main obstacle (Figure 4).

Figure 4. Main bottlenecks of Guatemalan producers



Result 13: CAFTA does not significantly affect the competitiveness of smallholder producers of corn, potato, mango and flowers in Guatemala. Under CAFTA, potato and yellow corn (but not with corn) producers remain competitive; and mango and flower producers become even more competitive (see Table 12).

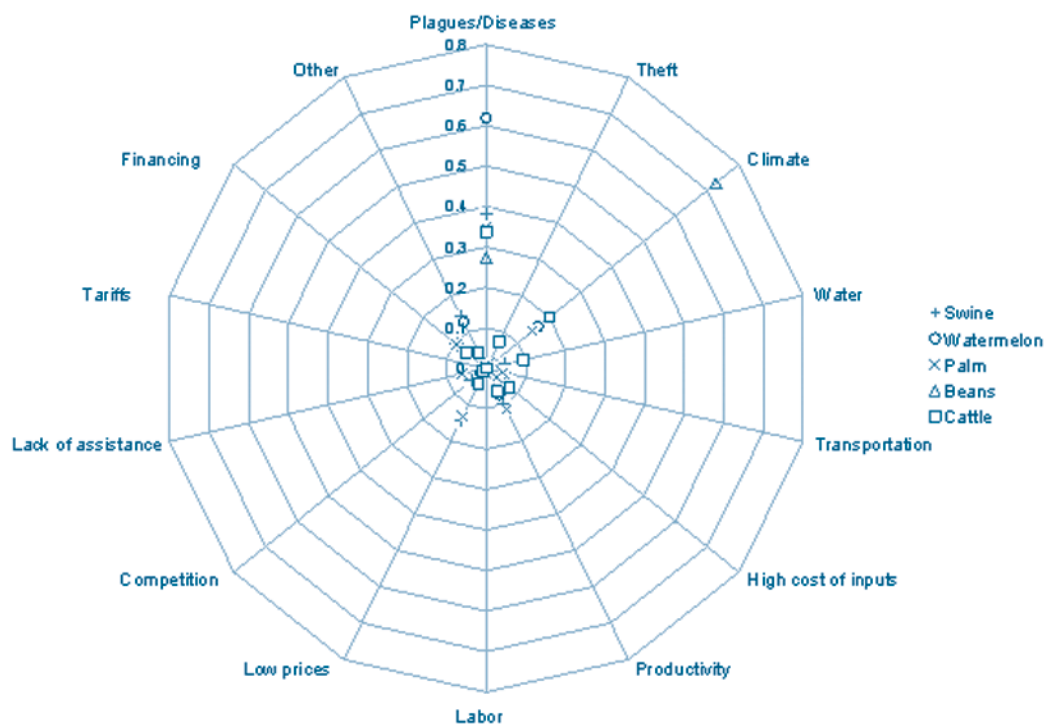
Table 12. Guatemala: Competitiveness indexes before and after CAFTA

	Import substitutes			Export Products	
	White corn	Yellow Corn	Potato	Mango	Flowers
Total production cost	125.80	77.00	183.70	248.10	0.60
Production cost, 10% margin	138.38	84.70	202.07	272.91	0.66
Production cost, 20% margin	150.96	92.40	220.44	297.72	0.72
Pre-CAFTA tariff	0.15	0.15	0.40	0.15	0.40
Pre-CAFTA domestic price, 10% margin	159.14	97.41	282.90	313.85	0.92
Pre-CAFTA domestic price, 20% margin	173.60	105.26	308.62	342.38	1.01
International price	134.90	128.48	472.90	771.00	2.50
International price plus tariff	155.14	147.75	662.05	886.65	3.50
Pre-CAFTA competitiveness index, 10% margin	0.97	1.52	2.34	2.46	2.71
Pre-CAFTA competitiveness index, 20% margin	0.89	1.39	2.15	2.25	2.48
Post-CAFTA competitiveness index, 10% margin	0.85	1.32	1.67	2.83	3.79
Post-CAFTA competitiveness index, 20% margin	0.78	1.21	1.53	2.59	3.47

3.2.5 Honduras

A relatively high proportion (between 76 and 90%) of Honduran producers is facing problems, with the exception of pig farmers (only one third). Most bottlenecks are related to pests, diseases and climate (Figure 5). Adverse climatic conditions are the most serious bottleneck faced by bean producers (pointed out by 50% of them), whereas pests and diseases are the main problem of watermelon producers (50%). Pests are also the main problem of one-third of smallholder growers of African palm, and diseases are the most serious problem for a similar proportion of beef producers.

Figure 5. Main bottlenecks of Honduran producers



Result 14: In Honduras, CAFTA lowers the competitiveness of small producers of beans to a critical level and renders pig farms non-competitive. At the same time, CAFTA slightly improves the position of small producers of beef cattle, and strengthens the already strongly competitive position of watermelon and African palm producers (see Table 13).

Table 13. Honduras: Competitiveness indexes before and after CAFTA

	Import substitutes		Export Products		
	Beans	Pork	Watermelon	Palm Oil	Beef
Total production cost	493.20	77.20	36.90	156.30	219.00
Production cost, 10% margin	542.52	84.92	40.59	171.93	240.90
Production cost, 20% margin	591.84	92.64	44.28	187.56	262.80
Pre-CAFTA tariff	0.15	0.40	0.15	0.15	0.40
Pre-CAFTA domestic price, 10% margin	623.90	118.89	46.68	197.72	337.26
Pre-CAFTA domestic price, 20% margin	680.62	129.70	50.92	215.69	367.92
International price	683.70	114.90	378.70	1918.00	418.20
International price plus tariff	786.26	160.86	435.51	2205.70	585.48
Pre-CAFTA competitiveness index, 10% margin	1.26	1.35	8.11	9.70	1.24
Pre-CAFTA competitiveness index, 20% margin	1.16	1.24	7.44	8.89	1.14
Post-CAFTA competitiveness index, 10% margin	1.10	0.97	9.33	11.16	1.74
Post-CAFTA competitiveness index, 20% margin	1.00	0.89	8.55	10.23	1.59

3.3 Prioritizing public investments in infrastructure⁶

This section analyzes how improved access to infrastructure could help to maximize the benefits or minimize the costs that rural producers will face as a result of CAFTA. The following types of infrastructure were included in the analysis: roads (includes different types of roads, as the main determining factor of access to markets), electricity, drinking water and telephones.

The benefits of access to infrastructure among rural households were analyzed against the costs of implementing such infrastructure. This cost-benefit analysis was done at the national level in each country, focusing on the regions that produce CAFTA-sensitive commodities. The results of this analysis are expected to help government in prioritizing their investment expenditures, and as such provides an important input into the formulation of the complementary policy agenda in each country.

Access to public infrastructure affects household income (or expenditures) in two ways: First, it reduces transaction costs that small producers face when they try to access other markets. This cost reduction changes relative prices which in turn trigger changes in production decisions. Second, improving access to infrastructure affects the allocation of labor between agricultural and non-agricultural activities.

The analysis also seeks to quantify the additional effects of the different combinations of infrastructure. The results suggest that while access to one type of infrastructure has a limited impact on household income (or expenditures), the effects of access to three or more types of infrastructure are very significant.

Result 15: The total effects on household income/expenditures of increased access to markets, electricity, drinking water and telephones are positive and significant in all countries.

However, this result does not provide information on how to prioritize public investment. For this reason, simulations were carried out to determine the impact of new investments in infrastructure, in order to estimate the rates of return for each type of infrastructure. The simulations were performed under the following assumptions:

- In the case of road improvement, it was assumed that the existing roads are upgraded to a higher level according the following categories: no road, dirt roads, gravel roads and paved roads. The upgrading costs (per square meter) used are as follows: establishing an dirt road costs around \$4.53; upgrading a dirt road to a gravel road costs \$26.68; and paving a gravel road costs \$36.80.
- The costs of road improvements are shared among the households living in the geographical unit of analysis.
- The cost of installing a public phone was estimated at \$720.
- The cost of connecting a single house to the electricity grid was estimated at \$124.

⁶ This section is based on the following publication: Benza, Magdalena; Jansen, Hans G.P.; Nakasone, Eduardo; and Torero, Máximo. Prioritizing public investment in infrastructure to optimize CAFTA impact. IFPRI, Washington DC. Owing to the lack of consistency among available data, this analysis did not include Nicaragua.

- For public phones and the electricity as access rate of 25% access rate was assumed.
- The economic life span of each type of infrastructure was assumed 20 years.
- A discount rate of 10% was assumed.

Result 16: Investing in infrastructure has the higher return in Costa Rica, followed by Honduras, El Salvador and Guatemala (see Table 14).

Result 17: With the exception of Costa Rica, where completing the electricity grid generates an exceptional return, investment in telephones show the highest return, followed by electricity and roads (see Table 14).

Table 14. Economic return (net present value per capita in US\$) of investments in infrastructure

	Honduras	Guatemala	El Salvador	Costa Rica
Roads	42	27	19	-30
Telephone	399	105	456	587
Electricity	273	78	68	803
Total	714	210	543	1360

In order to generate comparable results among rural areas that are likely to be affected by CAFTA, each country's Living Standard measurement Survey (LSMS)⁷ was used to identify producers of some of the agricultural commodities investigated earlier in the market chain analysis. Specific simulations were carried out taking into account only households that are primarily producers of these commodities (using the criterion if such products took first or second place in the household's sale of agricultural products)⁸. Tables 15 – 18 provide the results of this exercise.

Result 18: In Honduras, infrastructure investments in areas with high concentrations of small pig farmers show the highest economic returns (see Table 15).

⁷ It must be noted that although LSMS data do not represent production, they provide information on the origin and type of rural products of each country, so that GIS (Geographical Information System) based data can be used to run the simulations.

⁸ In El Salvador, the survey did not provide any information on specific agricultural products, thus it was not possible to carry out this exercise. In this case, the exercise was only applied to households dedicated to agricultural products.

Table 15: Honduras: Economic return (net present value per capita in US\$) of investments in infrastructure in areas with high concentrations of producers of sensitive commodities

	Corn	Beans	Swine
Roads	11	9	86
Telephone	277	269	468
Electricity	179	153	358
Total	467	431	912

Result 19: In Guatemala, infrastructure investments in poultry producing areas have the highest economic return (see table 16).

Table 16. Guatemala: Economic return (net present value per capita in US\$) of investments in infrastructure in areas with high concentrations of producers of sensitive commodities

	Corn	Beans	Poultry
Roads	21	19	27
Telephone	86	84	106
Electricity	49	86	79
Total	157	186	213

Result 20: In Costa Rica, investing in upgrading the road infrastructure is not profitable; however investments in telephone and electricity infrastructure are extremely profitable in regions with high concentrations of cattle farmers (see Table 17).

Table 17. Costa Rica: Economic return (net present value per capita in US\$) of investments in infrastructure in areas with high concentrations of cattle farmers

	Cattle
Roads	-32
Telephone	629
Electricity	472
Total	1069

Result 21: In El Salvador, infrastructure investments have the highest economic return in livestock producing areas (see Table 18).

Table 18. El Salvador: Economic return (net present value in US\$) of investments in infrastructure for different types of agricultural producers

	Households with agricultural production	Households with livestock production	Households with agricultural and livestock production
Roads	10	22	19
Telephone	322	510	425
Electricity	28	88	76
Total	360	620	520

With the necessary adjustments, the type of analysis and tools developed in the Project can be very useful to assess in an ex-ante manner the potential impact of other free trade agreements. In particular they could provide valuable inputs for the current negotiations between Central America and the European Union regarding trade liberalization.



ABOUT THIS PUBLICACION

The purpose of this report is to provide a summary of the Project on “The Impact of the Central America Free Trade Agreement on Agriculture and the Rural Sector in Five Central American Countries”. The Project was executed by the International Food Policy and Research Institute (IFPRI) and the Economic Commission for Latin America (ECLAC) and was funded by the World Bank, ECLAC through the Inter-American Development Bank (IDB), the Netherlands Embassy in Nicaragua, the Regional Unit for Technical Assistance (RUTA) through the Department for International Development (DFID) of Great Britain, and the Central American Bank for Economic Integration (CABEI).

The Project covers the five Central American countries (Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica), and it is expected that its outputs serve as a guide on the type of policies and complementary measures that must be taken for the countries to maximize the use of the new economic environment brought about by CAFTA and, at the same time, reduce possible negative impacts that could take place among the vulnerable groups of the rural areas in these countries.